



**WORLD FORUM FOR WOMEN IN SCIENCE  
3<sup>rd</sup> INTERNATIONAL  
CONFERENCE FOR WOMEN  
IN SCIENCE NETWORK**

**ORGANIZED BY**



**2019**

**Cairo, Egypt**



## KEYWORDS

Biology, Medicine, Environment, Engineering, Agriculture, Material Science, Energy, Entrepreneurship, Innovation, Gender Issues, Sustainable Development Goals and Science Diplomacy, Science Advice

## ACKNOWLEDGEMENTS

The 3<sup>rd</sup> International Conference for Women in Science (World Forum for Women in Science) would like to express sincere gratitude and appreciation to all authors, organizers, sponsors, partners for their input and contributions to this book.

## BOOK

The 3<sup>rd</sup> International Conference for Women in Science (World Forum for Women in Science) published this book as a record of conference including abstracts of papers presented by the participants.

## ABOUT

Established in 2017, the International Conference for Women in Science (World Forum for Women in Science) is an annual event organized this year by Arab Science and Technology Foundation and Women in Science Network. The conference provide innovative, science-based solutions for sustainable development challenges.

## VENUES

The British University in Egypt, Cairo, Egypt  
Le Meridian Heliopolis, Cairo, Egypt

## SUGGESTED CITATION

Abstract Author(s) Name (2019). Abstract Title. In Arab Science and Technology Foundation & Women in Science Network (Eds.), 3<sup>rd</sup> International Conference for Women in Science: World Forum for Women in Science, Cairo, Egypt; Innovation, Entrepreneurship and Science Diplomacy for Sustainable Development (pp. from-to).

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ENJOY

**GIZA PYRAMIDS**

# FORWARDS

# FORWARDS



## LETTER FROM HONORARY CHAIR

### PROF. ABDALLA ALNAJJAR

President, Arab Science and Technology  
Foundation, UAE

Dear colleagues and conference participants,

The Arab Science and Technology Foundation is organizing this 3<sup>rd</sup> International Conference for Women in Science to show its strong interest in supporting women and girls in science. It is our continued commitment to strengthen their participation in all fields of life for sustained development in our society.

The enhanced participation of women in S&T is not only good for individual women, it makes science better and more relevant. This is supported by mounting evidence which shows that gender diversity encourages smarter, more creative teams, paving the way for enhanced knowledge outcomes. This is vital for addressing global challenges and socioeconomic development of communities.

In the past decade or so, the global community has made a concerted effort to engage women and girls in science. However, according to the UNESCO, **women continue to be underrepresented**, making up less than 30 percent of the world's researchers. Moreover, a 2018 report by researchers at the University of Melbourne showed that without further interventions, the gender gap in science will likely persist for generations. The study sought to find out how many women work in different fields of STEM (science, technology, engineering, mathematics and medicine), and when—if ever—women will be equally represented in the workforce.

[Continue →](#)

Mapping the gender gap using data on 36 million authors of more than 10 million articles published over the past 15 years, the study showed that almost every field of STEMM is moving towards a 50:50 gender ratio. This is clearly encouraging news. On the flip side, the data predicted that, based on current trends, several disciplines are a long way from **reaching gender parity**, including surgery (52 years), mathematics (60 years) and computer science (280 years). Across countries, the gender ratio of all PubMed-indexed authors varied by >30%; Serbia holding the most women authorship (55%), while Japan stands at the bottom (22%). For the 2016, Arab country estimated % of women authors show that Tunisia 48%, Egypt 44%, Morocco 41%, UAE 35%, and Saudi Arabia 27%.

Given women's past and ongoing contribution to scientific progress, it is not hard to understand why **closing the gender gap is the right thing to do** for science and society. By commemorating the Women in Science conferences, we are supporting and championing women and girls around the world to ensure their rightful place at the research table.

In this event we highlight the powerful role of women in scientific inquiry. It is an opportunity to identify and tackle barriers that many still face them in gaining full and equal access to all scientific fields. Dr. Amal Amin, Dr Ghada Amer and their teams, they all have put enormous effort to realize this conference.

All appreciation goes to the event sponsors, without their contribution we would not have reached this point.

We are honored to have you all with us in charm and lively city of Cairo. I wish you pleasant stay and valued time.

*Abdalla Alnajjar*

President of Arab Science  
And Technology Foundation

## ABOUT ALNAJJAR



**Dr. Abdalla Alnajjar\*** is an Arab Emirati Business magnate, Entrepreneur and Innovator. He is best known for the "Arab Science & Technology Foundation" (ASTF); the first state of the art Foundation in the Arab world which has, under his leadership, successfully identified and supported outstanding RDI and business activities throughout the Arab Region and beyond. His achievements created

values and generated massive popularity for himself; he successfully, for three consecutive years, has been named as one of the "Most Influential Arabs in the World".

Dr. Abdalla as an entrepreneurial minded person, is always enthusiastic towards new challenges, inventions and innovations. His dream of changing Arabs culture through Science & Technology, he shaped the way for Arab intellectuals to develop and use their resources by transforming their knowledge into business. Apart from ASTF he, also, put foundation for companies specialized in developing new technologies and innovative products. Some of portfolios of his success establishments are Aashab Bio Industries, Arab Biotechnology Company, Rawafid, AccuVis Bio and Maeen-Hyaline. These companies has achieved substantial growth in past and some are expanding internationally.

The stories behind Dr. Abdalla success and achievements won't come true without clear vision, strong belief to succeed and the dedication that he himself and his tirelessness team showed for over 30 years of continuous successful initiatives and Business creation, design & implementation.

Since the Youth are the backbones of every nation's development, Dr. Abdalla continues to develop initiatives and competitions to encourage new ideas and innovations. This has led to launch "Best Technological Business Plans", "Investing in Technology Forum", and the "ElBaz initiative for Arab Qualities Competition" All are synchronized to extract, support & match technopreneurs with investors.

His management & guidance's was not limited for ASTF and his directly owned ventures, but it give unbound support, trainings and mentorship to Arab established new technology companies. And, he believes that the Arab Region would not accelerate as fast if not cooperated with international partnerships that have gone far with technological advancements. That's why he invested time and resources in 147 startups throughout the Middle East.

Currently, Dr. Abdalla holds key positions in various companies and management advisory committees. He is the President of ASTF and the Vice President of the Licensing Executives Society – Arab Countries (LES-AC), besides being on the board of many international companies and initiatives.

\* Dr. Abdalla holds a PhD degree in Applied Physics (1992) from the School of Engineering and Applied Science, Durham University, UK.





# LETTER FROM CHAIR

**DR. AMAL AMIN**

Founding Chair of Women in  
Science Network, Egypt

Dear colleagues and conference participants,

WISWB is not only a conference for women in science but it's a new initiative with main theme as science for sustainable development. In this context, it is mainly aimed to achieve sustainable development goals (SDGs) including SDG 5 as gender equality in scientific communities.

According to the UNESCO report, percentage of women in science represent only 28 % of the total capacity of workers in academia, universities and research institutes, which decreases gradually at the higher level of academic career, to be only 6 % in some places, which is considered as a very low percentage compared to the number of female students at the undergraduate levels.

This fact pushed several people to work on the reasons and the solutions; where I, with other colleagues began our discussions inside global young academy and other organizations years ago; about how to solve the problem in a more practical way where finally WISWB was launched, to let science as a common language and a general template to create a healthy environment for more cooperation between female and male scientists, increasing inclusion and involvement for more females inside scientific skeletons.

This initiative was supported from the beginning with high level organizations, sponsors and partners which push that initiative forward, to support science and scientists in a fruitful way.

[Continue →](#)

Also, WISWB is an initiative to let science for all, where participation at the event is free with the training and the students` activities, which may lead in the future to sustainable development of the society with science. Generally, WISWB conferences include all STEM fields and related social studies which occur via 5 main tracks including several fields as biological, physical, engineering, agricultural & environmental, which may lead to a fruitful cooperation and a real impact for the sake of sustainable development. Finally, I would like to thank all sponsors, partners and participants for their contribution to support the meeting. Also, I would like to welcome all participants wishing them all the best and successful contribution.

*Amal Amin*

Founding Chair of  
Women in Science Network

## Amal Amin



The first Egyptian young scientist who attended world economic forum-Summer (WEF) DAVOS 2009, 2010-China based on the initiative of IAP to empower the young scientists worldwide. She attended and coorganized the founding workshop of global young academy (GYA) in Berlin (2010) to become one of the few active founders of GYA and its executive committee member for the following three years after foundation (GYA; 2010-2013) ...

**[Read her full biography in Science Diplomacy Track](#)**



# LETTER FROM CO-CHAIR

## PROF. GHADA AMER

Vice President, Arab Science and  
Technology Foundation, Egypt

Dear colleagues and conference participants,

It is great pleasure and an honor to welcome you at the 3<sup>rd</sup> International Conference for Women in Science (World Forum For Women in Science), March 12-14, 2019, in Cairo, Egypt and that will provide a unique opportunity to learn, share and present your latest findings and innovations in health, environment, engineering, agriculture, material science and energy disciplines along with entrepreneurship and science diplomacy. As a conference Co-Chair and the Vice President of The Arab Science and Technology Foundation (ASTF), I am pleased to support this conference.

Building on the success of preceding previous International Women in Science conferences conducted in 2017 (Cairo, Egypt), 2018 (Indaba, South Africa), and Arab Women in Science and Technology Conferences conducted in 2009 (Dubai, United Arab Emirates under the patronage of Her Royal Highness Princess Haya Bint Al Hussein), and 2014 (Khartoum, Sudan), World Forum for Women in Science 2019 will provide a platform for networking with the world's leading women and men scientists, focusing on the best solutions and state of the art technologies for solving sustainable development challenges worldwide, founded on the experience of the participants.

The forum will feature a highly interactive and multidisciplinary program including training workshops, opening reception, plenary sessions as well as oral talks and poster sessions, presentations, discussions and students' competition.

[Continue →](#)

One of the highlights of the forum will be Innovation Map plenary session that will be conducted on the 1st day of the conference at BUE Auditorium by a team of multidisciplinary experts from ASTF board members who will deliver key messages covering the knowhow of entrepreneurship in science and technology.

In addition to the forum, I invite you to enjoy your stay in the beautiful city of Cairo, which provide a pretty weather, delicious food, night life and inspiring Egyptian 7000 year's civilization monuments.

Finally, I wish to thank all sponsors, partners, volunteers and all those who support this forum.

I wish you a successful and highly productive forum.

*Ghada Amer*

Vice President of Arab Science  
And Technology Foundation

## Ghada Amer



Ghada Amer, Professor of Electrical Engineer, is the Vice President the Arab Science and Technology Foundation (ASTF). She holds few more positions within her profession, like the Head of Electrical Engineering Department at Benha University and the CEO of the Global Awqaf Research Center (GARC). Also because she believe on the important of R&D for her community (not only in Egypt, but in all Arab countries) ...

[Read her full biography in Innovation Map Track](#)



***Let us choose  
for ourselves our  
path in life, and  
let us try to  
strew that path  
with flowers.***



***Emilie du Chatelet,  
mathematician, physicist,  
and author***



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ABU SIMBEL

# SCIENTIFIC COMMITTEE



# SCIENTIFIC COMMITTEE

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- Prof. Mervat Fouda, Food Industry and Nutrition Division, National Research Center, Egypt
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- Prof. Ashraf ELsaid, Petroleum Applications Department, Egyptian Petroleum Research Institute (EPRI), Egypt
- Associate Prof. Sherien Elagroudy, Faculty of engineering, Ain shams University, Egypt
- Associate Prof. Mohamed Salama, Director of the Medical Experimental Research Center (MERC), Mansoura University, Egypt
- Dr. Hoda Yousry, Faculty of medicine, Suez Canal University, Egypt

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- Prof. Wageh Darwish, Laboratory of Lipid analysis, Department of Health sciences, Faculty of Health Sciences, Hokkaido University, Japan
- Associate Prof. Amal Kasry, Faculty of Engineering, The British University in Egypt
- Associate Prof. Gasser Hassan, Department of Computer-Based Engineering Applications- Informatics Research Institute (IRI), City for Scientific Research and Technological Applications, Borg El-Arab City, Alexandria
- Ass. Prof. Yousef Yasseen Abdel-Rahim Sultan, Food Toxicology and Contaminants Department, National Research Centre, Cairo, Egypt
- Prof. Shymaa Mohamed Enany, faculty of pharmacy, Suez Canal University, Egypt





***Certain people –  
men, of course –  
discouraged me,  
saying [science] was  
not a good career for  
women. That pushed  
me even more to  
persevere.***

***Francoise Barré,***  
*virologist and winner of the 2008  
Nobel Prize in Physiology  
or Medicine*



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**AZHAR PARK**

# ADVISORY COMMITTEE

# ADVISORY COMMITTEE

-Prof. Dr. Deya Reddy, president of International science council (ISC). South Africa.

-Prof. Dr. Yehia A. Bahei-El-Din, Vice President for Research and Postgraduate Studies, The British University in Egypt, Egypt

-Prof. Dr. Venice K. Gouda, National Research Centre, Egypt, former minister for science and Technology.

-Prof. Dr. Nadia Zakhary, Professor of Medical Biochemistry, National Cancer Institute, Cairo University, former minister for science and technology

-Professor Dr. Wagida Anwar, public health, faculty of medicine, Ain Shams University, Egypt.

-Prof. Dr. Sonali Das, Council for Scientific and industrial Research (CSIR), Pretoria, South Africa.

- Prof. Dr. Hassan Azzazy, The American University in Cairo (AUC), Egypt.

-Prof. Dr. Mahmoud Abd El Ghafar, Chemical industries division, National research center, Egypt



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MARSA ALAM

# ORGANIZING COMMITTEE

# ORGANIZING COMMITTEE



- Prof. Dr. Ahmed Hammad, President of The British University in Egypt (BUE)
- Dr. Amal Amin Ibrahim, National Research Centre, Egypt, Founding Chair of WISWB
- Prof. Dr. Ghada Amer, Vice-president of Arab Science and Technology Foundation (ASTF), co-chair of WISWB 2019
- Dr. Amal Kasry, The British University in Egypt (BUE), Coordinator of WISWB 2019
- Prof. Dr. Usama F.M. Kandil, Egyptian Petroleum Research Institute, Egypt, Coordinator of WISWB 2019
- Prof. Ahmed Gabr, National Research Centre, Egypt, Coordinator of students` activities
- Dr. El Sayed Gamal Zaki, Egyptian petroleum institute, Coordinator of students` activities

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# ORGANIZING COMMITTEE

## Co-organizers:

- Mr. Amir Okasha, President Secretary, Arab Science and Technology Foundation - ASTF
- Mr. Mahmoud Hassan, Finance Officer, Arab Science and Technology Foundation - ASTF
- ASTF Volunteers, Arab Science and Technology Foundation - ASTF
- Ahmed Medhat, senior research assistant, Faculty of Engineering, BUE
- Amir Abdel Mawla, research assistant, Faculty of Engineering, BUE
- Mona Samir, research assistant, Faculty of Engineering, BUE
- Eng. Mohamed Yousef, assistant lecturer, Faculty of Engineering, BUE
- Eng. Nathalie Nazih, Senior assistant lecturer, Faculty of Engineering, BUE
- Rana Abdel rahman, Senior Student, Faculty of Engineering, BUE
- Salsabeel Kamal, Senior Student, Faculty of Engineering, BUE
- Salma Maher, Senior Student, Faculty of Engineering, BUE
- Salma Bahaa, Faculty of Medicine, MUST University
- Leila Ahmed, Faculty of Medicine, MUST University
- Mirna Ashraf, Faculty of Medicine, MUST University
- Habiba Rady, Faculty of Medicine, MUST University
- Theodora Nady, Faculty of Medicine, MUST University



***If you know you are  
on the right track, if  
you have this inner  
knowledge, then  
nobody can turn you  
off... no matter what  
they say.***



***Barbara McClintock,***  
*cytogeneticist and winner of the  
1983 Nobel Prize in Physiology or  
Medicine*



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**GOUNA**

# ORGANIZERS, & SPONSORS



# ORGANIZERS



## ARAB SCIENCE AND TECHNOLOGY FOUNDATION

### ABOUT

The **Arab Science and Technology Foundation** is non-governmental, non-profit, independent, regional and international organization, that was established in 2000. Its HQ in Sharjah, while its executive office is in Cairo. ASTF complements the existing scientific and technological efforts in the Arab world avoiding repetition and competition, also it represents the Arab aspirations for the advancement of human being and development of the Arab countries.

Additional information about ASTF is available at :

[www.astf.net](http://www.astf.net)



astf2000

# ORGANIZERS



## WOMEN IN SCIENCE NETWORK

### ABOUT

**Women in Science Network** is a network that came to life in Egypt on the 21st of March 2017, with a great event that gathered scientists of both genders, number of students under the name of science and sustainable development, which made us think of another event which was held in South Africa 2018, that became more successful and known all over the world, our goal is to reach for equality in the sake of reaching sustainability for a better future.

Additional information about Women in Science Network is available at :

   /WISWBMOVEMENT

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**SANOFI** Egypt is an affiliate of SANOFI, a global healthcare leader with more than 100,000 employees in 100 countries. These include more than 1,200 in Egypt, where the company has had a manufacturing site in Cairo since 1962 that currently produces over 120 million units of medicine per year. SANOFI Egypt primary focus is on patient needs. We provide integrated healthcare solutions through world-class medicines covering a vast array of diseases, innovative healthcare products, vaccines, and healthcare services. These come in the form of high quality, effective, and affordable medicines that allow for better access to healthcare and treating illnesses, including:

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- Oncology Treatments
- Central Nervous System Disorders
- Rare Diseases, such as Gaucher
- Immune-Mediated Diseases
- Infectious Diseases
- Degenerative Diseases of the Elderly
- Diabetes Vaccines

Additional information about SANOFI Egypt is available at :

[www.sanofi.com.eg](http://www.sanofi.com.eg)



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INNOVATION

### ABOUT

**Johnson & Johnson**, believe good health is the foundation of vibrant lives, thriving communities and forward progress. That's why for more than 130 years, J&J have aimed to keep people well at every age and every stage of life. Today, as the world's largest and most broadly based healthcare company, we are committed to using our reach and size for good. J&J strive to improve access and affordability, create healthier communities, and put a healthy mind, body and environment within reach of everyone, everywhere. Every day, our more than 130,000 employees across the world are blending heart, science and ingenuity to profoundly change the trajectory of health for humanity.

Additional information about J&J is available at :

[www.jnj.com](http://www.jnj.com)



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## ABOUT

**The British University in Egypt (BUE)** was inaugurated on the 22nd of March, 2006, by their Royal Highnesses the Prince of Wales and the Duchess of Cornwall. The Mission of the BUE Founder was to create a quality educational institution that would produce graduates with the skills and knowledge to contribute effectively to the development of Egypt, the MENA region and beyond. The British system of Higher Education was therefore adopted for the rigour of its Quality Assurance procedures and educational philosophy focusing on the development of graduates with independent learning and transferable employability skills.

Additional information about BUE is available at :

[www.bue.edu.eg](http://www.bue.edu.eg)



[britishuniversityegypt](http://britishuniversityegypt)

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## ABOUT

The Industrial Development Bank is an Egyptian bank established in 1947. The Bank provides a wide range of banking products and services to its clients, individuals, institutions and companies of all kinds, with a specialized vision and through a network of more than 15 branches spread across the governorates of Egypt. It provides all support to large, medium, small and micro enterprises and supports all development projects, as well as the bank's role in real estate financing and finance the delivery of gas to homes and factories.

Additional information about IDB available at :

[www.idbe-egypt.com](http://www.idbe-egypt.com)



***I was taught that the  
way of progress was  
neither swift nor  
easy.***



***Marie Curie,***  
*physicist, chemist, and winner of the  
1903 Nobel Prize in Physics and the  
1911 Nobel Prize in Physics*



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SHARM ELSHEIKH

# ABSTRACTS





3<sup>RD</sup> INTERNATIONAL CONFERENCE FOR WOMEN IN SCIENCE NETWORK

WORLD FORUM FOR WOMEN IN SCIENCE

## Track 1: Biology - Medicine - Pharmacy

## Track 1: Biology - Medicine - Pharmacy

### Colorimetric Chemosensors for Detection of Toxic Metals in Cosmetics

Hassan M. E. Azzazy

School of Sciences & Engineering, the  
American University in Cairo, Egypt

Cosmetic products may contain highly elevated levels of toxic metals and thus present a serious threat to public health, especially to women. Mercury, lead, and cadmium can replace nutrient minerals in enzyme binding sites and alter thousands of enzymes which may lead to multiple health problems. They may also deposit in many sites, causing local irritation or support development of infections. For example, exposure to mercury, reported to be present in skin whitening creams and aseptic soap, can cause kidney damage, psychological symptoms, and skin discoloration. Danger of exposure to toxic metals is not limited to users of cosmetics but affects their family members. They will eventually be discharged into wastewater where they enter the food-chain. Accurate methods, based on atomic absorption and mass spectrometry, are used for toxic metal analysis. However, these methods are costly and require centralized facilities. X-Ray fluorescence handheld devices have been developed for instant screening of toxic metals but are expensive. This presentation will briefly cover the effects of toxic metals on human health and the development of low cost and simple

colorimetric chemosensors for visual detection and recognition of toxic metals in cosmetics

#### Hassan M. E. Azzazy



Dr. Azzazy is a tenured full professor of Chemistry (2003-present) at the American University in Cairo (AUC). He serves as the

Chairman of Chemistry Department and was the Associate Dean for Graduate Studies & Research at the School of Sciences & Engineering. He is the founder/director of the International Medical Laboratory Scientists training program at AUC. Dr. Azzazy was a postdoctoral fellow and assistant professor at the departments of Medical & Research Technology and Pathology, University of Maryland School of Medicine, Baltimore, MD (1995-2002). Dr. Azzazy received his BSc and post-graduate diploma in Biochemistry from Alexandria University, Egypt. He received his PhD from the Graduate School of Biomedical Sciences, University of North Texas Health Science Center, Fort Worth, TX (1994) and was the recipient of the Faculty Merit Award as an Outstanding Graduate. He is certified as a Specialist in Chemistry by the Board of Certification, the American Society for Clinical Pathology in Chicago, IL. He also holds two board certifications in Clinical Chemistry and Molecular Diagnostics from the American Board of Clinical Chemistry, Washington, DC. Dr. Azzazy has over 28 years of experience in biomedical research and he is the founder/director of

Novel Diagnostics and Therapeutics Research group. Dr. Azzazy authored 90 scientific publications in international journals, 75 conference presentations, and 25 book chapters. His current Scopus H-Index is 26 and his total citations are 2460. He has co-edited two books on “Diagnostic Enzymology” and “Entrepreneurship & Innovation in Egypt”. He has supervised over 35 graduate students who have obtained their MSc and/or PhD degrees in Chemistry, Biotechnology, or Nanotechnology. Dr. Azzazy is an inventor on 8 patent families several of which have been granted or at the national stage. Dr. Azzazy is a strong advocate of entrepreneurship and has co-founded two nanomedicine startup companies. Dr. Azzazy is the recipient of over 60 awards including State Prize in Advanced Technological Sciences (Academy for Scientific Research & Technology, 2010), Excellence in Research Award (AUC, 2008), Global Innovator Award (Texas Christian University, TX; 2014), and Arab Innovation & Entrepreneurship Award (ASTF, UAE; 2015), Life Achievement Award (American Society for Clinical Pathology, 2018), and Shoman Prize for Arab Researchers in Medical Sciences (Shoman Foundation, Jordan, 2018).

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## Answering questions from the real world – from medicine to the SDGs

Mitsunobu R Kano

Department of Pharmaceutical Biomedicine,  
Okayama University, Japan

As a scientist with an experience of clinical medicine, I love to ask questions by knowing the real world. The questions from real world could be diverse, depending on the diversity of contexts in individuals, genders, or regions. For me the main question in my research have been “why some diseases are hard to treat?” The question came to me when I saw relatively young patients (in their thirties for example) suffered from already metastasized pancreatic cancer and died in a month or two, regardless with chemotherapy. Such insufficiency of modern medicine was not taught much in the systematized curriculum in medical school. I learnt it from the real world. In research setting, a “fashionable” approach then was focusing on tumor cells to explain the intractability. However, it seemed to me as merely a thought from a “systematized” comprehension seeing cancer as only cells cultured in dishes. I rather focused on the route for drugs to be delivered to the tumor cells after they are administered, because tumors are mostly being in tissues. To elaborate the idea I combined nanotechnology which was originated from the field of engineering. The hypothesis gradually supported by evidences is that obstacles are the specific structure of the vessels and fibrotic part in the tumor tissue. A difficulty has been to obtain a suitable model to test the hypothesis. We need to establish experimental systems to model the point of view, and it is taking time and efforts. And here come the SDGs. For me the STI for the SDGs seemed as an extension of the way I have been doing: asking questions by knowing the real world. To

transdisciplinary, activities. Sciences seem to prefer more systematic outputs, which may seem profound from our brain, than to those answering diverse questions. The latter may well seem less profound, with less evidences and less clarity, at first steps. However, considering the reason why ordinary people supported science in history might have been its power to achieve beyond what previous other attempts can explain for questions from the real world: such as “why planets behave differently from other stars in the sky?” The SDGs provide us a collection (at least partial) of modern questions from ordinary human beings in the real world. Let us challenge with our motivation to make “Zero to One”.

### Mitsunobu R Kano



Dr. Kano has experienced clinical medicine including gerontology, research in medical engineering and pharmaceutical sciences, and public services including academy activities and governmental commitments. The public services led him to efforts in developing education for general sciences, including implementation of achieving the United Nation’s Sustainable Development Goals (SDGs) into university administration in Okayama University. Dr. Kano graduated from and started research activity in University of Tokyo, did his clinical residency in St. Luke's International Hospital, and is now Professor and a Vice Executive Director in Okayama University. As the latter role he led the university to be awarded by the Japanese government for achieving the SDGs in 2017, and now

serves as Chair of SDGs Initiatives Planning Committee. Meanwhile he led to establish a new interdisciplinary graduate school focusing on the health care systems in the university including faculties from medical sciences, engineering, social sciences, and humanities, started in April 2018. Dr. Kano was the former Deputy Chair of the Young Academy Japan, and a former Executive Committee member of the Global Young Academy (GYA).

### Biobanks: Importance, Challenges and Regulations

Wagida A. Anwar

Faculty of Medicine, Ain Shams University, Egypt

The Biobank is defined as a place for storing biological specimens and data associated with scientific research purposes. It includes human-derived biological specimens such as blood, tissues, urine, saliva and other specimens such as nucleic acids, which form an accurate basis for conducting many researches to identify the causes of common diseases and how to treat them and develop drugs as well as how to prevent which will improve health for future generations. There is interest in promoting genetic and environmental research related to human diversity, health, and the biology of related diseases and the benefit of the population, with a focus on the topic of cancerous genomics as well as studies that include epidemiology of diseases. To establish Biobanks, a set of standards and principles

should be applied according to international standards to regulate the activities with regard to sample collection, storage, participation and reporting of results. This necessitates building the capacity of scientific groups through education and training. Also, facilitating research through the development of infrastructure equipped with the latest technology. It is important to ensure access by researchers to high-quality biodata-related samples to help create a relationship between disease and environmental factors, promote genetic research, to support global efforts in finding cases and treatment for different diseases, and encourage dissemination of research in scientific journals locally and internationally. In Egypt, the concept of Biobank is a new concept for many researchers as well as for the general public. We aim to introduce the concept and create a positive attitude for the various stakeholders. This has been adopted by the Egyptian Academy of Scientific Research and Technology since 2011 and resources were allocated for its establishment in various research centers. The challenges of establishment of Biobanks include the need of providing a firm framework for ethical management. When significant ethical issues arise, they are often managed by research ethics committees, and by specialists in various hospitals, research centers and universities. Another key challenge facing Egyptian vital banks is to obtain informed consent, and guidelines or legislative regulations. In addition, conflicting cultural and religious perspectives create additional challenges for legislators.

### Wagida A. Anwar



Dr. Wagida is professor at department of Community, Environmental and Occupational Medicine; Faculty of Medicine, Ain Shams University. She is president of the Specialized Federation of Scientific Research NGOs. As a General Coordinator of Health System Improvement Programs, Ministry of Health, Egypt since 2014, she contributed in drafting the Social Health Insurance Law (SHI), National Health Policy and Health component of the Sustainable Development Strategy 2030, which is a continuation of her contribution in Health Sector Reform Program in Egypt (1996-2002). She is the PI of several projects funded from different sources nationally and internationally. Internationally, she is a member of several Committees and Associations including Health Literacy Working Group, WHO Global Coordination Mechanism for The Prevention and Control of NCD (GCM/NCD), WHO since 2016, the Jury of the UNESCO - International Prize for Research in Life Sciences (Since 2009). Collegium Ramazini, Carpi, Italy since 2006. President, Pan African Environmental Mutagen Society. Nationally, she is a member of several Committee at the Ministry of Health, Academy of Science and Technology and the National Women Council. She is the President of the Specialized Federation for Health System Improvement NGOs, since 2014. Professor Anwar received a number of international prizes and awards including Marie Curie, FP7, EC, (2008), Dr. A. T. Shousha Foundation Prize (WHO) for 2001, Fogarty

International Fellowship Award, (1986) and the CEES Award, France (1986). Nationally, she received Ain Shams University Honorary Award, 2017, Egyptian National Award of the Academy of Sciences, (1992) and several other awards.

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## **Computer based automatic identification of abnormal locomotion activity in ASD model mice**

Shoji Komai

Nara Institute of Science and Technology, Japan

Behavior is analogous to our language consist of words and phrases over particular grammar or syntax. Understanding our behavior representing the neural activities of neural networks is very important to recognize its precise meanings and to predict it. In many neuro-developmental disorders in human, such as autism spectrum disorder (ASD), behavioral construction is disrupted. The diagnosis of ASD is made by its behavioral criteria, determined by a physician, which depends on her/his experience. Even in animal model of autism, classical analyses of behavior are carried out by human observation. Disadvantages of that are some of the important features behind the background, which are not apparently visible (conspicuous but subtle), may be overlooked, or are not analyzed due to the complexity of inter-connected behavioral features during human performance. In addition, it is very laborious and prone to lead

misinterpretation and compromised qualitative feature of analyzed data. We've employed modern technologies (motion feature extraction and analyzing system) in order to analyze maximum number of motion features without compromising analytical quality to capture abnormal motion features of ASD model mice. Our computer aided motion feature extraction system for analysis of behavioral features in the present study on ASD model mice in identifying abnormal motion features in freely moving state of an ASD model mice comparing to the control mice. ASD model mice was induced by applying valproic acid (VPA) in the embryonic stage. The model mice were video-recorded in an open field with or without its partner. Then, behavioral motion features were extracted and analyzed by using this system. The results, obtained by using this system, clearly identified the different pattern of behavioral domains in the motion of locomotor activity of mice and even showed behavioral transition in ASD model mice from control subjects in a freely moving state. Thus, it lays the pavement for the potential of generalized use of this method both for animal model and for human subjects in future.

### **Shoji Komai**



He got Ph.D. from Nara Institute of Science and Technology (NAIST), Japan. He worked in Kobe University and Max-Planck Institute for Medical Research, Heidelberg Germany as a postdoc. He tried to bridge the gap between molecular and behavioral

aspects in the field of neuroscience. Then, he tried to elucidate the functions of neuronal circuit in the real life. He has been not only trying to tackle the challenging issue in brain science but also trying to do social activities to make our OMOIROI (happy and fun) society and future as a scientist. He is an alumnus of Global Young Academy and an ex-chairperson of National Young Academy of Japan. He has been involved in Science Council of Japan, Japanese senior academy as a member of large-scale research fund and project committee. He acted as a chair of promotion Committee for JST Science Agora 2018.

### **Role of mGluR5 in Huntington's disease associated neurodegeneration and memory impairment.**

Fabiola M. Ribeiro

Universidade Federal de Minas Gerais, Belo Horizonte, Brazil

Huntington's disease (HD) is an autosomal-dominant neurodegenerative disorder caused by a polyglutamine expansion in the amino-terminal region of the huntingtin protein (htt). Mutated htt protein promotes progressive neuronal cell loss in the caudate putamen and neocortical regions of the brain, leading to the cognitive, motor and psychiatric alterations typical of HD patients. The metabotropic glutamate receptor 5 (mGluR5) regulates gene expression and modulates intracellular pathways that were shown to be altered in HD. The aim of this study was to evaluate whether mGluR5 plays a role in the

neurodegenerative process associated with HD and characterize drugs acting on the receptor that could ameliorate HD related phenotype. For this, mGluR5 knockout mice were crossed to a mouse model of HD, the BACHD. Additionally, BACHD mice were treated with an mGluR5 positive allosteric modulator, VU0409551. Our results show an increase in the number of microglia and astrocytes in the cortex of BACHD, mGluR5<sup>-/-</sup> and BACHD/mGluR5<sup>-/-</sup> mice at 12 months of age, as compared to control mice (WT). In addition, neurodegeneration was observed in the cortex, hippocampus and striatum of BACHD, mGluR5<sup>-/-</sup> and BACHD/mGluR5<sup>-/-</sup> animals at 12 months of age. Importantly, VU0409551 treatment rescued BACHD memory impairment, decreased neurodegeneration, increased the number of dendritic spines and augmented the expression of genes important for neuronal survival in BACHD mice. Taken together, these results indicate that mGluR5 plays an important role in HD related neurodegeneration and that VU0409551 is an effective neuroprotective drug.

#### **Fabiola M. Ribeiro**



Dr. Fabiola is an Associate Professor at the Universidade Federal de Minas Gerais (UFMG). She obtained her Ph.D. from UFMG in 2006 and, after that; she performed her postdoctorate studies at the University of Western Ontario, London, Canada. Dr. Ribeiro has supervised seven M.Sc. and five Ph.D. students, as well as two post-doctorate fellows. Nowadays, her research group

comprises five undergraduates, two M.Sc. and three Ph.D. students, and a lab technician. Dr. Ribeiro has 56 peer reviewed scientific papers published in highly respected scientific journals with H factor equals 18. She is an affiliated member of the Brazilian Academy of Science. She was able to have several grants approved in Brazil and abroad, which have granted her research group a laboratory containing all the necessary equipment to perform state-of-the-art technologies. Dr. Ribeiro main scientific contributions include the study of the mechanisms involved in neurodegeneration and the characterization of neuroprotective drugs acting on the glutamatergic system. These drugs were shown to be very effective to rescue the cell death observed in a mouse model of Huntington's disease (HD), decreasing synaptic loss and enhancing HD related memory impairment.

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### **Clinical Infection: Campylobacter Antimicrobial resistance, Clonal population structure and source attribution analysis**

Dr. Mohamed Elhadidy

Zewail City for science and technology, Egypt

The foodborne bacterial pathogen *Campylobacter* is among the most common causes of human gastroenteritis with consumption and mishandling of retail chicken is considered one of the most important infection sources. The alarming increasing rates in antibiotic resistance of *Campylobacter* isolates

raised the concern about studying the molecular mechanisms of resistance. The aims of this study were to: 1-Assign risk-based binary typing of *Campylobacter* isolates from human and environmental using PCR binary typing (P-BIT) system to evaluate a basis for subtyping that could also be related to the risk to human health from individual strains 2-Determine the dynamic of antibiotic resistance and investigate the clonal structure and genetic determinants of resistance 3-Determine the extent that the dynamics in genomic content of endemic *Campylobacter* contributes to clinical disease severity, transmission routes, and source attribution. The comparative genome analysis identified core and pan genome of *Campylobacter* species and how this is related to population structure, evolution of host/niche adaptation, and maintenance of *Campylobacter* species. The sequence information is uploaded into a central worldwide database, thus providing a community resource enabling researchers to enrich knowledge about the global diversity, transmission, population structure, ecology, and evolution of this important human pathogen. Data from environmental isolates provided novel insights on the importance of different potential sources of transmission of *Campylobacter* species, thus identifying potential intervention strategies and targets. Such findings are critically needed to reduce human disease burden from zoonotic pathogens in Egypt and other developing nations.



## Mohamed Elhadidy



Dr. Mohamed Elhadidy is currently an associate professor of Biomedical Sciences at Zewail City for science and technology, Egypt.

Dr. Elhadidy holds a DVM degree from Mansoura University in Egypt. He obtained his Master's degree in 2006 in Microbiology from Mansoura University and obtained his PhD (2010) in Microbiology from Virginia Tech University, USA. From 2011-2017, Dr. Elhadidy served as a research scientist at School of Medicine, University of Saskatchewan, Canada; University of Bristol, UK; and University of Gent and Scientific Institute of Public health in Belgium. In 2018, he also served as a visiting professor at University of Bath, UK. Dr. Elhadidy research interests is focused on investigating the ecology, epidemiology, and evolution of different food-borne pathogens causing human infection using different comparative genome analysis and population genetics studies. His most recent research activities implemented different genomics tools to investigate the molecular characterization of different genetic markers that play a role in virulence potential, antimicrobial resistance and transmission of shiga toxin-producing *Escherichia coli*, *Campylobacter* and *Brucella* to human. He is an author of more than 40 international scientific publications in this field. Dr. Elhadidy is a current member of the Global Young Academy, African Academy of Sciences, and National Microbiology Council and a

former member of committee, National Academy of Sciences, USA to develop framework of faculty members in MENA region and Egypt who are better able to teach issues related to the responsible conduct of science by combining tenets of active learning pedagogical techniques.

## CRISPR-assisted promoter shuffling in *Bacillus subtilis*

Guimin ZHANG

College of Life Sciences, Hubei University, China

In prokaryotes, gene expression is mainly controlled at transcriptional level, in which promoters are the most tunable elements for transcription regulation and have been extensively used in gene expression studies. However, when using promoter engineering strategies with large library size, it might face many practical difficulties such as the failure of library construction with low transformation efficiency and the long and labor-intensive characterization process for proteins lacking high-throughput screening methods. The bacterial immune system-derived CRISPR (clustered regularly interspaced short palindromic repeats) /Cas9 (CRISPR-associated protein 9) system has been demonstrated to be a robust and designable tool for genome editing in diverse organisms. Here, an oligonucleotide annealing based promoter shuffling strategy (OAPS) was

transformation, the specific promoter libraries of target genes, including BLA,  $\alpha$ -amylase from *B. licheniformis* were constructed, and directly analyzed in the industrialized strain, *B. subtilis* which has low transformation efficiency. About 2.5 % (21 out of 864) combinatorial promoters exhibited stronger strength than the native promoters, indicating that OAPS was capable of generating high ratio of functional mutants with a two orders of magnitude range of transcriptional control. CRISPR-assisted transformation procedure can enhance the integration efficiency of library fragments, as the double strand breaks (DSBs) introduced by Cas9 could significantly improve the homologous recombination efficiency and efficiently inactivate endogenous isoenzymes genes. In summary, the techniques was developed in this study, which provided powerful tools for promoter engineering.

### Guimin ZHANG



Prof. Zhang received her Ph.D. degree in microbiology from Huazhong Agriculture University in 2006, and now is a professor at the Hubei University, China. She is the recipient of Henry Fok Prize Award for young teachers, Distinguished Young Scholars of Hubei Science Fund, and "Yellow Crane Talents" program. Currently, she is the Director of Research Center of Bioenzyme Catalytic Engineering in Hubei Province. Her research interest focuses on molecular enzymology, synthetic biology, and green manufacture.

SO far, she has published more than 30 papers, and awarded 21 patents and 4 Scientific Advance Prize of Hubei Province.

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### Effect of Nutritional Intervention on Growth of Infants Accompanying Their Mothers in Prison

Nagwa A. Zein ELDin, Taghreed K. Omar, Amal A Fath Allah<sup>3</sup> Walaa A Abd El All

Pediatric Nursing Department, Faculty of Nursing, Menoufia University, Egypt

Infants who accompanied their mothers in prison were vulnerable to consequence of malnutrition. So, nutritional intervention program for those infants who deprived from outdoor facilities is a subject of interest. Therefore, the purpose of this study was to assess the effect of nutritional intervention on growth of infants accompanying their mothers in prison. A quasi-experimental design was used (Pre and posttest). The study was conducted in Qanater Women's Prison in Egypt. A convenience sample of 30 mother accompanying their infants in the above- mentioned setting was included. Three instruments were used: a structured interview questionnaire, an observational checklist and anthropometric measurements. The findings of this study revealed that infant growth improved after implementation of

differences regarding mother's knowledge and practices observed on posttest than on pretest. As well as, there were a positive correlation between mother's knowledge, practices and infant growth. The study concluded that mother's gained more knowledge and had better practices on posttest following the adherence of nutritional intervention. In addition, their infants had better growth after implementation of nutritional intervention. Therefore, it was recommended that nurse's officers should provide mothers in prison for periodical nutritional intervention to sustain their infants growth. Special provisions must be in place to ensure that the child's rights are promoted and protected whilst in prison, Child welfare, rather than prison authorities, should have primary responsibility for making decisions regarding children in prison, and specialists in social work and child development should supervise their care.

### **Nagwa A. Zein ELDin**



Dr. Nagwa is Professor of Paediatric Nursing at Menofia University where she worked at since graduation in 1986 as an instructor and up grading until her proficiency. Also, she worked at Philadelphia University in Amman- Jordan as an associate professor and as a quality assurance officer. She has many qualifications in teaching critical Paediatric Nursing, nursing theories, nursing research and many other subjects as paediatric neonatology and rehabilitation. Also, she is participating in

conducting nursing thesis and as an evaluator in many others as well as joining in the national project as quality assurance in higher education and project sponsored by HEEPH to reconstructing nursing curriculum through critical thinking skills for accreditation. Also, she is involved in developing learning Modules for -Pediatric Nursing Course Manual procedure of Pediatric Nursing- Critical Care of Pediatric Nursing and Manual Procedure of Critical Care of Pediatric Nursing.

### **Applicability of HF-LPME GC/MS to study the association between Bisphenol A, Phthalate metabolites and endometriosis in Women**

Leiliane Coelho André

Faculty of Pharmacy, Federal University of Minas Gerais, Brazil

Bisphenol A (BPA) and phthalates are chemicals widely used in food packaging, household items, among other products. These compounds are suspected of causing endocrine dysfunction in human and animals and are therefore known as endocrine disrupting chemicals (EDCs). A broader study of actual exposure can be accomplished through the analysis of the metabolites of these compounds that can be considered as biomarkers of exposure. Endometriosis, a disease characterized by the presence of ectopic implants of the endometrial glands and/or stroma and, is one of the main aggravations to women's

health, causing as main manifestations pelvic pain and infertility. The mechanism of pathological action of endometriosis is not fully elucidated yet, however, some studies have shown that endocrine disruptors may be associated with these alterations. To evaluate the association between BPA and phthalate metabolites and endometriosis was carried out a Case Control Study with patients from Hospital School of UFMG. This was case-control study of consecutive women with histologically proven endometriosis (n=30) and a control group (n=22) operated on for benign gynecological conditions without endometriosis. The biomarkers were analyzed using the hollow fiber liquid phase microextraction (HF-LPME) technique, by GCMS, which values obtained for the Study group were compared with the values obtained for the Control group. Chi square test and odd ratio test were used for to evaluate the results. The characteristics of the two groups like eating and smoking habits were evaluated but did no differ between the both. All nine metabolites were found in different concentrations in the urine samples in both groups. This study contributes to the evaluation of the association between endometriosis and compounds suspected of being endocrine disrupting chemicals (EDCs).

### Leiliane Coelho André



Dr. Leiliane is associate Professor at department of clinical and toxicological analysis, Federal University of Minas Gerais (UFMG). She is currently Director of the Faculty of Pharmacy at UFMG. She

holds a Master's degree in Toxicology from the University of São Paulo and a PhD in Analytical Chemistry from the Federal University of Minas Gerais. She works in the area of Occupational and Environmental Toxicology, in the study of exposure to environmental chemical contaminants and in the impact on human health; and development of analytical methods of biomarkers using gas chromatography (GC; GCxGC) and liquid (HPLC) techniques. She participated in studies to evaluate the early chemical exposure associated with health risks, in order to provide information in the initial stage of intoxications, the results of which can subsidize decision making aiming to establish public norms and policies in the health field environmental and worker health. She participated in several activities related to the Environmental Health and Occupational Health Program in the Americas as a consultant to the Pan American Health Organization (PAHO) of World Health Organization (WHO) in Washington in the years 2005, 2009, 2010, 2011 and 2012.

### Translational Research Goals for the Egyptian Network for Neurodegenerative Disorders (ENND)

Mohamed Salama

Medical Experimental Research Centre, Mansoura University, Egypt

The Egyptian Network for Neurodegenerative Diseases was established on 2013 with three strategic

research goals, which are; studying the genetic and environmental causes of neurodegenerative diseases in our locality, developing novel biomarkers for such diseases, finally; improving and developing functional animal models for neurodegeneration. The first goal, we succeeded to start the first nationwide study on gene environment interaction in (Parkinson's disease) PD. This study which started on 2012 joined the forces of 16 neurology clinic and research centers inside Egypt, beside international collaboration with Technical University of Munich (TUM) and Keil University, Germany. The study, published few weeks ago succeeded in identifying new possible genetic risk factors for PD in Egyptian patients, these findings, also, shed the light on interaction between environment and genes in developing such disease. Our work on genetics of neurodegenerative diseases is continuing now to study genetics of familial forms of such disorders, in addition, ENND is currently in the middle of assembly of reference Egyptian genome. The second goal is developing biomarkers of brain damage. Our research goal showed successful results that attracted funding from different organizations and led to very promising findings that has been published recently. The third goal was to improve existing animal models for neurodegenerative disease, as these form the foundation of our understanding of disease process and early stage of therapeutic trials. We were able recently to design animal models of Leigh syndrome as well as low cost models of tauopathy.

### Mohamed Salama



Dr. Salama obtained his Medical Degree in 1999 from Mansoura University, Egypt. There, he began his clinical training and shortly thereafter started his post as clinical toxicologist at Mansoura University Poison Control Center. He received his MSc in Toxicology in 2006, and through a DAAD scholarship his PhD degree in Neurotoxicology in 2011 through collaboration between Mansoura University, Egypt and Philipps University in Marburg, Germany. Upon returning to Egypt he realized that there was a large gap between basic neuroscience research and clinical application. Dr. Salama's passion and dedication to bridge the divide between basic and clinical research and to further the field of translational research is clearly evidenced through his many contributions to this field. He established the first Translational Neuroscience Unit in Egypt, resulting in published findings in international journals and invited presentations. His research on strategies that protect nerve cells from dying in Parkinson's disease received recognition, following his success, many students became interested in experimental neurology and his program has since grown. Continuing to close the gap between basic and clinical neuroscience, he established relationships with clinicians in the neurology field by focusing on translational research projects and by funding from international (DFG, DAAD, IBRO, ISN, MDS, PMDF). and national (STDF, ASRT) organizations In his sixth year of a DAAD funded project he is

trying to evaluate the environment-gene interaction in Parkinson's disease. These studies combine basic neurotoxicologists, clinical neurologists, and geneticists in one project. This collaborative research led to establishing the Egyptian Network for Neurodegenerative Disorders. Dr. Salama was selected as an SOT Global Senior Scholar in 2013 and Translational/bridging awardee on 2016. He was awarded by Parkinson's and movement disorders foundation (PMDF) for his continuing research in the field of neurodegeneration. Recently he was selected as a member of Egyptian Young Academy of Science (EYAS). Currently, Dr. Salama is the director of the Medical Experimental Research Center (MERC) of Mansoura University. He is Atlantic fellow for Equity in Brain Health at Global Brain Health (GBHI), University of California, San Francisco | Trinity College, Dublin and IBRO-MENA Co-Chair.

## The Seven Wonders of Microbial Genomics

Ramy Karam Aziz

Faculty of Pharmacy, Cairo University, Egypt

DNA sequencing is transforming biology at an unprecedented pace. The acceleration of genome research and the emergence of metagenomic technologies have begotten a new biology characterized by high throughput experiments and big data generation, both of which necessitate powerful computational analysis tools. All biological sciences, and microbiology in particular, have benefited from advances

in bioinformatics and genomics. Applications of genomics and metagenomics include tracking epidemics, preventing infections, fighting antibiotic resistance, understanding the human microbiome and its role in health and disease, and cataloguing and predicting drug-microbiome interactions. The next decade will witness the transformation of these new fields from observational studies that report associations to mechanistic studies that unravel disease causation.

### Ramy Karam Aziz



Ramy K. Aziz is currently a professor and chair of the Department of Microbiology and Immunology at the Faculty of Pharmacy-Cairo University. He earned his PhD in microbiology and immunology from the University of Tennessee Health Science Center, USA in 2005, and, since then performed postdoctoral research at leading institutions including the University of Chicago, San Diego State University, and the University of California San Diego. His research interests span molecular epidemiology, systems biology of microbial pathogens, evolution and emergence microbial pathogenesis and resistance, microbial and bacteriophage genomics and metagenomics, the human microbiome and pharmacomicrobiomics. His scientific publications include a book, 7 book sections, and 70 articles in peer-reviewed journals. He received the Cairo University incentive and excellence

awards in medical sciences and the State Incentive Award in Medical Sciences. He recently received funding from the Egyptian Academy of Scientific Research and Technology to establish an Egyptian Genome Center and Microbiome Center at Faculty of Pharmacy, Cairo University.

### **Mycobacterial DNA-binding protein 1 is critical for long term survival of *Mycobacterium smegmatis* and simultaneously coordinates cellular functions**

Shymaa Enany & Sohkichi Matsumoto

Faculty of Pharmacy, Suez Canal University, Ismailia, Egypt

Bacteria can proliferate perpetually without ageing, but they also face conditions where they must persist. Mycobacteria can survive for a long period. This state appears during mycobacterial diseases such as tuberculosis and leprosy, which are chronic and develop after long-term persistent infections. However, the fundamental mechanisms of long-term living of mycobacteria are unknown. Every *Mycobacterium* species expresses Mycobacterial DNA-binding protein 1 (MDP1), a histone-like nucleoid associated protein. *Mycobacterium smegmatis* is a saprophytic fast grower and used as a model of mycobacterial persistence, since it shares the characteristics of the long term survival observed in pathogenic mycobacteria. Here we show that MDP1-deficient *M. smegmatis* dies more rapidly than the parental strain after entering

stationary phase. Proteomic analyses revealed 21 upregulated proteins with more than 3-fold in MDP1-deficient strain, including DnaA, a replication initiator, NDH, a NADH dehydrogenase that catalyzes downhill electron transfer, Fas1, a critical fatty acid synthase, and antioxidants such as AhpC and KatG. Biochemical analyses showed elevated levels of DNA and ATP syntheses, a decreased NADH/NAD<sup>+</sup> ratio, and a loss of resistance to oxidative stress in the MDP1- knockout strain. This study suggests the importance of MDP1-dependent simultaneous control of the cellular functions in the long-term survival of mycobacteria.

#### **Shymaa Enany**



Dr. Shymaa Enany is an associate professor of Microbiology and Immunology at Suez Canal University, Egypt. She received her PhD from School of Medical and Dental Sciences, Niigata University, Japan. Her dissertation focused on the molecular characterization of community acquired methicillin resistant *Staphylococcus aureus* (CA-MRSA), the leading cause of many life-threatening illnesses. For her postdoctoral work, she collaborated with many laboratories in San Diego, California, USA and in Niigata, Japan analyzing the proteome of *Staphylococcus aureus* and monitoring the reactions of innate immunity and airway cytokines in response to MRSA infections. Shymaa completed her research focusing on developing novel diagnostic agents for *Mycobacterium avium* complex disease

using proteomic approaches. She has focused for the first time on the importance of MDP1-dependent simultaneous control of the cellular functions in the long-term survival of mycobacteria and has explored the effect of MDP1 on Mycobacterial growth and metabolism. She received many national awards and international prizes for her scientific contributions. She honorary served in the editorial board of many international publishing organizations.

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## Regulation of Gene expression in *Trypanosoma brucei*

Tania Bishola

Centre for Molecular Biology at Heidelberg University, Germany

*Trypanosoma brucei* subspecies, which are causative agents of African trypanosomiasis, are transmitted to their mammalian hosts through the bite of a tsetse fly, and developmental regulation of gene expression is essential for the survival of the parasite in different host environments. In the mammalian host, trypanosomes live as bloodstream forms and in the tsetse midgut as procyclic forms. Nearly all protein-coding genes in trypanosomes are arranged in polycistronic transcription units; individual mature mRNAs are generated from primary transcripts by 5'-trans-splicing and 3'-polyadenylation. As a consequence, the parasites rely almost exclusively on post-transcriptional mechanisms for control of gene expression and RNA-binding proteins (RBPs) assume the burden that is normally carried out by transcription factors. The

RNA-binding protein RBP10 is expressed exclusively in the bloodstream-form parasites where it is essential. RBP10 is a major determinant of the bloodstream-form differentiation state: it binds to procyclic-specific mRNAs and targets them for destruction. In my PhD project, I am looking at the preceding control step, trying to find out how expression of RBP10 itself is controlled. I have already identified several different regions of the mRNA that can each contribute to developmental regulation, and am currently trying to narrow these down in order to identify sequence motifs. The next step will be to find proteins that bind the regulatory sequences, by applying different novel techniques.

### Tania Bishola



Tania Bishola is a PhD student in the Centre for Molecular Biology at the University of Heidelberg. Her doctoral research in Professor Clayton's Group involves the regulation of gene expression through the life cycle of the African trypanosome, *Trypanosoma brucei*. She is a lecturer assistant at the University of Kinshasa (D.R. Congo) and she also has a leading position within BEBUC, an Excellence Scholarship Program implemented in 25 Congolese institutions. Tania's bachelor degree in Biology is from the University of Kinshasa (D.R. Congo), where she had conducted studies investigating the biological activities of natural compounds from plants. She got her MSc degree in 2017 from the University of Nairobi (Kenya), researching olfaction in the tsetse fly vector of



trypanosomosis at the International Centre for Insect Physiology and Ecology (ICIPE). As a PhD researcher, Tania is involved in the supervision of Master students' internships and formal practical classes, teaching RNA biology techniques. Through her PhD work, she hopes to bring innovative solutions for understanding the RNA-Protein interaction detection in living cells. Since November 2016, she acts as the Prime Speaker within BEBUC, where she is involved in the evaluation and selection of students and for the scholarship program. Within this system, Tania has created platforms that not only allow the young scholars to develop their proposals for the implementation of future excellent research centers in Congo but also mentor young women for their career paths towards professorships.

### **International collaboration for multidisciplinary investigation of diabetes toward a sustainable development**

Rym Kefi

Laboratory of Biomedical Genomics and Oncogenetics, Pasteur institute, Tunisia

Diabetes represents a growing public health problem affecting currently more than 400 million people world-wide. It is characterized by chronic hyperglycemia leading to degenerative organic complications which constitute a socio-economic burden in terms of quality of life, disability, mortality and health cost. Worldwide, more than 5 million deaths a

year are caused by diabetes equivalent to one death every seven seconds. The big challenge for the international community is to curb the growth of diabetes prevalence and to improve the diagnosis and the treatment of patients. Diabetes is a complex multifactorial disease caused by genetic and environmental factors such as lifestyle (dietary practices and physical activity). Our goal is to better understand the etiology of Type 2 Diabetes through the identification of new biomarkers characterizing the mechanism of this disease and the impact of genetic and environment factors. These objectives will be achieved through international collaborative projects bringing together competences of experts in several fields. Our multidisciplinary approach based on the integration of various data (epidemiological, biological, genetic, nutritional and microbiotic characteristics) will pave the way to precision medicine in order to improve the health care of patients and to prevent degenerative complications.

#### **Rym Kefi**



Dr Rym KEFI is an Associate Professor (PhD, Habilitation to Supervise Research) in Institute of Pasteur in Tunisia (IPT). She is team leader in the Laboratory of Biomedical Genomics and Oncogenetics and responsible for the Genetic Typing Laboratory in IPT. She obtained a Master degree and a PhD at the University of the Mediterranean (Marseille- France). She worked on Mitochondrial DNA diversity in current

and prehistoric human populations. She joined 2006 IPT. She is mainly involved in research on human genetic disorders, genetic diversity in North Africa and genetic typing in forensic. She has acquired an experience in project editing and implementation through her contribution in more than ten collaborative scientific projects. Her skills were recognized at national, regional and international levels. Rym KEFI is TWAS young affiliate since 2010, and Global Young Academy member since 2012. In 2017, she was selected for the Next Einstein forum. She was selected by the World Economic Forum as one of the top 50 scientists in the world under 40 years old. She was also selected by Science and Technology in Society forum (STS) as "Future Leader". Rym KEFI is also involved in teaching activities. She is an author/ co-author of more than 70 publications.

## Production of GlcNAc by $\beta$ -N-Acetylglucosaminidase expressed in *Pichia pastoris*

Jiang sijing

The College of Life Science, Hubei University, China

$\beta$ -N-Acetylglucosaminidases (NAGase) (EC 3.2.1.52) belonging to the Glycoside Hydrolase 3 family, can remove N-acetylglucosamine(GlcNAc) from the non-reducing end of chitin or chitosan. GlcNAc and its derivatives been utilized in dietary supplements and for therapeutic development. GlcNAc has been used as a supplement for the treatment of osteoarthritis and inflammatory bowel disease. It is also used in many treatment

trials, namely for cancer, autoimmune reactions, sexual disorders, and intestinal diseases. The industrial bioproduction of GlcNAc with satisfactory yields and purity remains an imperative for profitable commercialization. The enzymatic bioconversion of chitin may achieve this goal; therefore NAGase could be used to produce GlcNAc in industry. In this study, the NagZ gene of *Bacillus subtilis* 168 was synthesized according to the codon usage bias of *P. pastoris* and expressing in *P. pastoris* X33. After fermentation using the recombinant strain with four-copy NagZ, the highest NagZ activity achieved to 3.2 U/mL at the 12th day. The purified NagZ showed that the optimal reaction temperature and pH is 60 °C and 6.0, respectively. It can keep over 80% activities after pre-incubation at 55 °C for one hour, and keep over 80% activities from pH 4.5 to 10.0. GlcNAc was acquired via hydrolyzing the colloidal chitin by chitinase and the purified NagZ together. It is the first time that  $\beta$ -N-Acetylglucosaminidase encoding gene was expressed in *P. pastoris*, and it is also the first time to hydrolyze colloidal chitosan to produce GlcNAc through  $\beta$ -N-Acetylglucosaminidase.

### Jiang sijing



Associate Prof. Jiang received her Ph.D. degree in Preventive veterinary medicine from Huazhong Agriculture University in 2010. She joined Hubei University in 1999, and then promoted as an associate professor in 2005. Her research interest

focuses on molecular enzymology, synthetic biology, and green manufacture. She published more than 15 papers, and awarded 3 patents and 3 Scientific Advance Prize of Hubei Province. She has developed multiple microbial strains with high-yield enzyme and 2 have been licensed for commercial applications.

### **Antioxidant activity of clove (*Syzygium aromaticum*) and honey extracts significantly reduce inflammatory cytokines and liver function enzymes in experimental rats fed on carbon tetrachloride (CCl<sub>4</sub>)**

Esther Maina

University of Nairobi, Kenya

Liver, a key detoxifier, is prone to injury due to reactive oxygen species (ROS) which deplete the body's stores of antioxidants leading to oxidative stress. Consumption of foods high in antioxidants replenishes the body with important anti-oxidants which break down ROS thus lowering inflammatory responses and preventing liver damage. In this work, clove and honey, which are known to be rich in anti-oxidants were evaluated for their ability to breakdown ROS, Reactive nitrogen species (RNS) and lower oxidative stress in rats. Purified extracts were tested in vitro for ROS scavenging by 1,1-diphenyl-2-picrylhydrazyl (DPPH) and in vivo using CCl<sub>4</sub>-induced liver injury in a rat model. Fifty experimental rats were assigned to 5 groups each consisting of 10 animals and

treated as follows in groups 1-5; 1. Positive control (PC) fed on CCl<sub>4</sub> in olive oil 2. fed CCl<sub>4</sub>/ honey extract, 3. Fed on CCl<sub>4</sub>/ clove extract, 4. Double negative control (NC) fed on standard diet and 5. NC fed on olive oil. Following liver histopathology and Liver/Kidney function assays on sera, PC rats showed fibroblastic cell proliferation and inflammatory cells infiltration not seen in group 3 (clove). Both clove and honey significantly reduced cytokines (TGF- $\beta$ , TNF- $\alpha$ , EGF) and liver function enzymes (ALT, AST, GGT) activity compared to the CCl<sub>4</sub> group. Clove highly inhibited DPPH compared to honey and conferred better liver protection against CCl<sub>4</sub>. These findings indicate that clove and honey contain compounds with the ability to reverse liver fibrosis.

#### **Esther Maina**



Dr. Esther is a biochemist with research interests in the Genetic of Cancer. She is a Senior lecturer in the department of Biochemistry, University of Nairobi, and she has collectively 13 years of teaching experience at several universities including the University of Nairobi, Kampala International University, and the University of Birmingham U.K. She has contributed to the teaching of both undergraduate and postgraduate modules. Her work provides a useful link between Biochemistry, Molecular Biology and Genetics in the department and encouraging research collaborations with

like-minded scientists. She supervised several PhD and Masters' projects. Her role has included both formulating research hypotheses and laboratory techniques to be utilized, grant proposal writing and guiding students through their projects on a day-to-day basis. She is also involved in the mentorship of young ladies at the university and as part of the "Akili Dada" initiative. She enjoyed giving motivational talks to students on science and life in general. Her ambition is to influence as many young Africans as possible into considering careers in STEM subjects.

### **miRNA signature derived from GBM plasma exosomes as a diagnostic biomarker**

Luz Milbeth Cumba Garcia

Mayo Clinic Graduate School of Biomedical Sciences, USA

Gliomas including glioblastoma (GBM) are the most common malignant brain tumors. Glioma extracellular vesicles (EVs), especially plasma exosomes, have biological effects such as mediating immunosuppression and contain signature tumor-specific cargo that could serve as liquid biopsies. Increasing interest in molecular biomarkers to determine patient prognosis in GBM has suggested that EV miRNA-based signatures may be able to predict progression-free, overall survival, differentiate normal donors from GBM patients, and distinguish true progression from treatment-related pseudo-progression. We have established a simple two-step technique, using density

gradient ultracentrifugation, to isolate plasma exosomes from glioma patients and normal donors. Short non-coding RNA sequencing from these exosomes reveals many differentially expressed miRNAs in GBM patients with high fold change/low false discovery rates compared to normal donor plasma exosomes. The AUC for detection of patients with GBM using this method is 0.968. In addition, multiple novel miRNAs and other short non-coding RNA species (Y-RNA, piRNA, snoRNA) were found with some differential expression. In conclusion, miRNA analysis from plasma exosomes has the potential to accurately identify patients with GBM. These findings as well as additional differentially expressed short non-coding RNA species suggest plasma EVs may serve as a robust platform to develop GBM liquid biopsies.

### **Luz Milbeth**



Luz is Ph.D. student at Mayo Graduate School in Rochester, MN. She is originally from Puerto Rico. Luz was graduated in 2012 from the Universidad Metropolitana with a Bachelor's Degree in Cellular and Molecular Biology, where she performed studies on HIV epidemiology that resulted in two publications. Luz has conducted research in different countries including Brazil, Germany with the Nobel Laureate Harald zur Hausen, and Spain at the Institute of Parasitology and Biomedicine Lopez Neyra. In 2013, Luz obtained her Master's Degree from this institution. Her thesis project was published in the journal Nature-Scientific

Reports. In 2014 she taught basic science skills to college students in China before being recruited to Mayo Clinic's Postbaccalaureate Research Education Program (PREP/PostBac). She has been working at Mayo Clinic for 4 years now. During her first year at Mayo, Luz worked with Dr. Marina Ramirez Alvarado on amyloidosis disease. Then, she transitioned to the lab of Dr. Aaron Johnson where she worked on acute neuroinflammatory diseases, which resulted in two publications. She is currently working with Dr. Ian Parney, analyzing the molecular signature of plasma extracellular vesicles shed from glioblastoma tumors. She also has an interest in science policy, science diplomacy, and regulatory affairs.

### **The new magical fit for Egyptian cancer patient: precision medicine and artificial intelligence**

Hoda Yousry Abdallah Ibrahim

Faculty of Medicine, Suez Canal University, Egypt

With the introduction of the concept of digital health, disruptive technologies such as genomics, biotechnology, and artificial intelligence (AI) became promising tools to be adopted in medical care, help reducing waste in the healthcare system, addressing systematic issues in over-treatment, care delivery, and care coordination. A new medical approach termed precision medicine is now emerging for disease treatment and prevention that takes into account

individual variability in genes, environment and lifestyle for each person. By adopting this new medical approach, we can transform clinical and genetic findings of patients into personalized treatment according to each patient findings using AI techniques. So, we introduced our startup – MedPredict - to revolutionize the conventional cancer medical practice in Egypt via collecting, storing, normalizing, and tracing cancer patient's data. Our first product (BrCP) is designed for brain cancer patients and was built via gathering patients' data (history, clinicopathological data, radiological and laboratory findings and genomic profiles) for producing a generic action plan to the user (e.g. the recommended chemotherapy type and dose for this patient, the recurrence and survival rate, the follow up rate, the risk assessment for relatives) based on the input data, giving each patient his own personalized regimen that is most appropriate for him creating an innovative Egyptian brain Cancer predictive model.

#### **Hoda Yousry Abdallah**



Dr Hoda Yousry Abdallah is a lecturer of medical genetics and the coordinator of the molecular biology unit in center of excellence for molecular and cellular medicine (CEMCM) in her university. She is the director of the information technology unit in her faculty and the training coordinator in CEMCM. She is also the CEO and founder of MedPredict Startup specialized in medical technology field. Although, she is a graduate of medical school, she is also

interested in the fields of human development and scientific research. She is a member in many funded projects for scientific research advancement in Egypt; as establishment of center of excellence for molecular and cellular medicine in Suez Canal university, project for studying genetic and epigenetic changes in brain tumors and Kaizen student project. Dr. Ibrahim research interest is in molecular and cancer genetics, where her PhD research was on genetic and epigenetic changes in brain tumors and she is currently continuing her research in this area thereafter as it's one of the most important health priorities in Egypt and worldwide. In 2011, she was awarded a national Prize from "Life makers organization" founded by Dr. Amr Khaled, in the sector of scientific research for a project named "Planning for Egypt's future in scientific research sector". In 2016, her PhD work was chosen as the best scientific poster in the 3rd young researchers conference and she was awarded for this accomplishment.

### **Leptin Inhibits Glucose Intestinal Absorption by Decreasing Glucose Transporters and Na<sup>+</sup>/K<sup>+</sup>ATPase**

Ola El Zein

Biology Department, American University of Beirut, Beirut, Lebanon

Whether leptin controls food intake and body weight by modulating nutrient absorption is still a controversial issue. The aim was to investigate the direct effect of luminal leptin on glucose

intestinal absorption (GIA) and Na<sup>+</sup>/K<sup>+</sup>ATPase and to elucidate for the first time the signaling pathways involved. By day 23-post confluence, Caco-2 cells are differentiated and are appropriate to use as a model for intestinal transport studies. Leptin reduced GIA maximally on this day, the time at which the protein levels of leptin receptors and glucose transporters increased. This inhibitory effect was mediated via a decrease in the number of SGLT1 and GLUT2 and in Na<sup>+</sup>/K<sup>+</sup>ATPase activity. To elucidate the mechanisms of action, the results suggest that leptin reduces GIA by activating PKC that leads to a sequential activation of p38MAPK, PI3K and ERK. As for the Na<sup>+</sup>/K<sup>+</sup>ATPase pathway, leptin reduced significantly the ATPase by activating p38MAPK via inhibition of PKC, an upstream inhibitor of the kinase. ERK and PI3K are modulators of the pump and are not along the pathway activated by leptin but cross talk with it at the level of p38MAPK. The results will help in designing new drugs for the treatment of obesity and other related disorders.

### **Ola El Zein**



Dr Ola El-Zein is a lecturer at the American University of Beirut (AUB) and the American University of Science and Technology (AUST). She is the first woman with a PhD in Cell and Molecular Biology from AUB. Growing up in a modest family in Lebanon and receiving full scholarships for her studies, El-Zein strongly believes that she can make a difference in the world by integrating

science with diplomacy. Dr El-Zein considers teaching a challenging opportunity to instill in the next generation the necessary knowledge and skills. She is also a researcher whose work will help in designing new drugs for the treatment of obesity and other related disorders; thus reducing their pain to bring them back the bliss and pleasure of a “healthy” life. Dr El-Zein has participated in several international conferences and workshops. She was chosen as the youngest woman scientist to participate in a plenary session in WSF. Dr Ola is an active board member of Arab World Association of Young Scientists (ArabWAYS) and a volunteer at the Children’s Cancer Center. Currently, she is pursuing a degree in media studies. Dr El-Zein hopes to actively link science and society and contribute to the development of her country.

compositions, unsupervised self-administration and lack of adequate knowledge about the phytochemicals and their pharmacological properties, there is a potential of adverse effects with the use of herbs. One of the serious risks is the interaction of concomitantly administered herbs with conventional therapy. Herbal drugs can interfere with the absorption, transport and/or metabolism of conventional drugs thereby increasing or decreasing the pharmacological and toxicological effects of either component. Although potential drug-drug interaction are well recorded for conventional drugs, Drug interaction assessment of herbal products is inherently complicated due to their complex composition, each component acting through multiple targets and multiple pathways; and our relatively narrow knowledge of individual constituents that are responsible for interaction. The situation gets more complex as herbal medications are usually self-administered, and a typical medical history does not include questions about self-prescribed remedies of this nature. Hence, many healthcare professionals are not well-informed about herb-drug interactions. A cross-sectional study design was conducted from May to June 2017. In addition, ten key informant interviews were conducted with healers. About half of the study participants have ‘ever used’ herbal medicines with most having used it concomitantly with conventional medicines.

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### **Assessment of Herb-Drug Interactions between Conventional Drugs and Commonly Used Herbs by Diabetic, Hypertensive and HIV patients, in Ethiopia**

Mariamawit Y Yeshak

College of Health sciences, Addis Ababa University, Ethiopia

The use of herbal products is becoming very popular worldwide fueled partly by the common misconception that ‘natural’ is ‘safe’. However, due to intrinsic pharmacokinetic and pharmacodynamic interactions, variability in herbal product

### Mariamawit Yonathan Yeshak



Mariamawit started her tertiary schooling in Pharmacy at Addis Ababa University (AAU) completing her B. Pharm in 2001 and her M. Pharm in 2005. She was subsequently awarded a SIDA/Sarek grant to pursue her PhD at Uppsala University. Her PhD was on a unique class of plant peptides called cyclotides. Her doctoral research findings added significant contribution to what is known about cyclotides. She received a grant from (ISP), Uppsala University, to start a research group at AAU. Mariamawit is currently an Assistant Professor of Pharmacognosy at Addis Ababa University, where she leads a research group called BaSIL (Bioactive Secondary Metabolites for Improving Life). BaSIL carries out biochemical studies on medicinal plants and is still funded by the ISP. Through an Ethiopian Government research grant she is also focusing on indigenous knowledge systems and specifically on clinical applications of traditional medicine. Mariamawit is a founding Fellow and Chair of the Ethiopian Young Academy of Sciences; and is an inaugural fellow of Africa Science Leadership Program (ASLP). She is also an inaugural Next Einstein Forum (NEF) ambassador of Ethiopia and recently nominated as a Young Affiliate of The World Academy of Sciences (TWAS). Mariamawit has published her work in peer reviewed international journals.

### Exploring the marine invertebrates for cytotoxic and pro-apoptotic effects against liver cancer cells

Vidushi S Neergheen-Bhujun, Rima Beesoo, Ranjeet Bhagooli, Wen-Wu Li, Alexander Kagansky, Theeshan Bahorun

Department of Health Sciences, University of Mauritius, Mauritius

The marine biome over the last few decades has triggered a lot of interest in view of the structurally unique and highly pharmacologically active natural products. The island of Mauritius is bestowed with one of the world's largest exclusive economic zone which represents a rich and largely untapped biodiversity. Marine sponges are important producers of bioactive compounds and are, therefore, preferential targets in the search for novel drugs. In this vein, the present study unfolds the selective cytotoxic activity of the sponge *Neopetrosia exigua* collected from Mauritian waters with the aim to identify bioactive compounds with anticancer potential. The total crude extract was obtained from *N. exigua* using dichloromethane and methanol (1:1) followed by sequential fractionation with hexane, ethyl acetate and water. The in vitro cytotoxic effects against six human cancer cell lines and molecular mechanisms underlying cell death were evaluated. Gas-chromatographic and mass-spectrometric (GC-MS) analyses revealed the chemical constituents. Ethyl acetate fraction of *N. exigua* (NEEAF) revealed pronounced dose dependent cytotoxic activity with IC<sub>50</sub> value of 6.87 ± 0.78 µg/mL against HepG2 cells. Acridine orange/ethidium bromide and Hoescht



staining indicated apoptosis. An increase in reactive oxygen species (ROS) and depolarisation of the mitochondrial membrane with concomitant decrease in endogenous superoxide and catalase antioxidant enzyme activity were observed in NEEAF mediated cell death. Preliminary chemical screening of NEEAF through GC-MS analysis identified the anticancer compound beta-sitosterol trimethylsilyl ether as the most significant component representing 23.9% of the extract. Overall, these results suggest that the potential of NEEAF against liver cancer.

### Vidushi Neerghen-Bhujun



Dr Vidushi is the Head of the department of Health Sciences at the University of Mauritius, where she is a senior lecturer since 2014. She is also affiliated to the ANDI Centre for Biomedical and Biomaterials Research at the University of Mauritius. She was graduated with a PhD in Biosciences in 2008. Vidushi has research interest centered on the cancer chemo-preventive effects of bioactive extracts derived from food and medicinal plants indigenous to Mauritius. Vidushi is determined at finding locally optimised solutions for the prevention and management of cancer, an intensifying problem on the African continent, including Mauritius. Her research interfaces with medicine, molecular biology and biochemistry and has culminated in more than 50 impactful communications. She has been an active member of the Global Young Academy

from 2012 to 2017, a Next Einstein Forum Ambassador and a fellow of the African Science Leadership Program. In 2014, she was honored by the World Economic Forum as one of the Global Young Scientists 2014/2015. In 2017, she received the Best African Woman Researcher Award from Merck Africa for her outstanding contribution to cancer research.

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### **New hope for patients with triple negative breast cancer: Strategies for converting immunotherapy non-responders to responders**

Mai F. Tolba and Hany A. Omar

Faculty of Pharmacy, Ain Shams University, Cairo, Egypt

Immunotherapy constitutes a promising new era in cancer therapy that successfully transformed clinical oncology protocols. The first Food and Drug Administration (FDA) approval for immune checkpoint inhibitors targeting either the programmed death (PD)-1 receptor or its ligand PD-L1 was in 2011 for treating patients with metastatic melanoma. The approval of this class is being extended to include other types of immunogenic tumors. Although breast cancer (BC) was first categorized as non-immunogenic tumor type, there are certain subsets of BC that showed a high level of tumor infiltrating lymphocytes (TILs) such as triple negative breast cancer (TNBC). Preliminary data from clinical trials presented promising outcomes for

patients with advanced stage/ metastatic TNBC. While the objective response rate (ORR) was relatively low, it is still promising because of the observation that the patients who respond to the treatment with immune checkpoint blockade have favorable prognosis and often show a significant increase in the overall survival. Therefore, the main challenge is to find ways to enhance the tumor response to such therapy and to convert the non-responders to responders. This work highlights the up-to-date strategies adopted at either the preclinical or the clinical settings to enhance tumor responsiveness to immunotherapy.

### Mai Tolba



Dr. Mai Tolba is an assistant Professor of Pharmacology and Toxicology, Faculty of Pharmacy, Ain Shams University, Cairo, Egypt

and an associate member of the American Association for Cancer Research (AACR). She got her Ph.D. in 2013, through a Joint Supervision Scholarship between Ain Shams University and The University of Texas Medical branch, Galveston, Texas, USA. She received a Fulbright Scholar Award in 2015 to conduct postdoctoral research at Chapman University School of Pharmacy in Irvine and the University of California Irvine, USA. She also received L'Oreal-UNESCO for Women in Science Fellowship in 2016 for her research in the field of studying the mechanisms of resistance of hormone-responsive cancers to chemotherapy. In 2018 she was

nominated as an affiliate member at the African Academy of Sciences (AAS). Dr. Tolba is currently focusing on investigating novel strategies to enhance tumor response to immunotherapy which is the evolving approach in the management of hard-to-treat cancers such as triple negative breast cancer. She has co-authored various publications in the fields of Pharmacology and Drug discovery that were published in highly prestigious journals. She also participated with several presentations in both national and international conferences. The long-term goal of Dr. Tolba's research work is to improve the wellbeing of cancer patients. Dr. Mai Tolba always believes that to change the world you should start by yourself and do the best you can in your field. She has always loved Gandhi's quote "Be the change you want to see in the world".

### The current status of Toxoplasma gondii infection among Egyptian rheumatoid arthritis patients

Nagwa Mostafa El-Sayed

Research Institute of Ophthalmology, Egypt

This study determined the relationship between Toxoplasma gondii infection and rheumatoid arthritis (RA) disease among Egyptian patients. One hundred RA patients and 50 healthy subjects participated in this study. The patients were classified into three groups, G1 included recently diagnosed RA patients with the disease duration of less than one year (prior treatment); G2 included RA patients receiving anti-tumor necrosis factor agents and RA patients in G3

received disease modifying anti-rheumatic drugs (methotrexate, antimalarial, corticosteroids). Serum samples of all participants were examined for anti-Toxoplasma immunoglobulin G (IgG) antibodies and positive samples were further analyzed for anti-Toxoplasma IgM antibodies to detect the possibility of reactivation of latent toxoplasmosis. Also, the association between Toxoplasma seropositivity and clinical, laboratory and radiological features of these patients were determined. The results showed a significant higher percentage of Toxoplasma IgG positivity in RA patients (54%) than in the controls (32%). 20.40% of Toxoplasma IgG positive patients had anti-Toxoplasma IgM antibodies with a statistically significant difference as comparing to Toxoplasma IgG positive controls. A positive correlation was found between disease activity and Toxoplasma seropositivity. This correlation indicated the need to improve awareness of Toxoplasma infection and its management in RA patients to avoid any resulting serious complications from reactivation of the latent toxoplasmosis.

### Nagwa Mostafa El-Sayed



Dr. Nagwa is a Professor of Medical Parasitology. She currently works as a Head of Medical Microbiology & Parasitology Department at Research Institute of Ophthalmology, Giza, Egypt. She has B.Sc. in general Medicine & Surgery, Faculty of Medicine, Zagazig University with very good grade with honors. She has Master and MD Degrees in Medical Parasitology, Faculty of Medicine, Cairo University. She does researches about Infectious Diseases

and Parasitic Infections, especially those affecting the eye. She is an author in more than 35 published articles included in the Science Citation Index (SCI), International Scientific Indexing (ISI). She has organized many training courses and workshop in the field of Medical Parasitology and scientific skills. She has participated in several national and international conferences, seminars, congresses, symposiums and forums. She is a member in many scientific and medical societies. She is a member in OSWD "Organization for Women in Science for the Developing World". She is a supervisor on many MD and Master Theses. She is a reviewer in many scientific journals. She has numerous editorial assignments in many journals. She received many national awards for the excellent medical achievements and scientific publications.

### Identification of New Emerging Narcotics in Egypt

Rania Hussien; Sarah Ahmed; Hanem Awad

Regulatory Toxicology Lab, Centre of excellence, National Research Centre, Egypt

New substances of abuse have recently been spread among youth in Egypt with numerous reports warning their use due to their dangerous effects on human. However to date the composition of the main constituents of these narcotics are unknown. This study aims to identify the active constituents of these unknown substances of abuse through collection of different wide spread street- drug samples from different users then separation and identification of active

constituents of these samples using High-performance liquid chromatography (HPLC), Gas chromatography/mass spectrometry (GC/MS) and Liquid chromatography/mass spectrometry (LC/MS) analysis. The data analysis of these samples resulted in the detection of at least thirty different compounds among them there are at least five synthetic cannabinoids. In addition, the presence of common compounds such as THC, Amphetamine, MDA, Tramadol and Oxazepam has been confirmed as well.

#### Hanem Awad



Dr. Hanem Awad obtained her B.Sc. Degree in Chemistry, May 1991, and her MSc. degree in December 1997 from Faculty of Science, Mansoura University, Egypt. She has completed her PhD in 2002 from Dept. of Biochemistry & Division of Toxicology, Wageningen University, The Netherlands and has postdoctoral position at the same Department, Wageningen University, The Netherlands from 2002 till end of 2005. She is a Prof. at the National Research Centre, Egypt. She is working as Regulatory Toxicology Group Head, Centre of excellence, National Research Centre, Cairo, Egypt. She has supervised more than ten MSc. And Ph.D. thesis She has published more than 60 papers in reputed journals and has been serving as an editorial board member in four journals and as a reviewer in more than 20 journals.

### Biodiesel production capacities of *Aspergillus* isolates and mutants

Hala Abdel Salam Amin

Department of Chemistry of Natural and Microbial Products, National Research Centre, Egypt

Biodiesel fuel has attracted considerable attention as an environmentally friendly alternative fuel for diesel engines. This research manipulates the use of *Aspergillus* whole-cell lipase as a biocatalyst and waste frying oil (WFO) as a feed-stock for biodiesel production. A total of 37 different *Aspergillus* isolates were isolated and screened for lipase and esterase production abilities. Out of them, two isolates A3 and A10 were selected as good enzyme producers. The 18S rDNA gene sequences of A3 and A10 showed 100% homology with that of *Aspergillus tamarii* and *Aspergillus flavus*, respectively. Chemical mutagenesis of the two isolates by ethyl methyl sulfonate (EMS) was performed aiming to improve their WFO transesterification ability. RAPD analysis using three primers was done for detecting the degree of polymorphism among wild types and produced mutants. Two mutants nameley A03a and A10c showed better conversion ability of WFO to biodiesel compared to their wild types.

### Hala Abdel Salam Amin



Prof. Hala is a professor for Chemistry of Natural and Microbial Products Department at National Research Center of Egypt. Her research interest

focuses on microbial transformation of natural products using microbial enzymes or whole cells. She is a Principle Investigator of a current national project titled "Biodiesel Production from Waste Frying Oil by Genetically Improved Fungal Whole Cells" and a previous international project titled "Surface Immobilization of Saponin Hydrolase Enzyme on Agricultural Residues: Novel Biocatalysts for Soybean Saponin Hydrolysis" CRP/EGY14-04 (2014) and funded by CRP – ICGEB Research Grant, Italy. She had a previous experience in cultivation of various microorganisms using SmF and SSF, separation and purification of different enzymes, cells and enzymes immobilization techniques, and spectroscopic determination of the chemical structure of the naturally occurring compounds.

### A novel tool for G-protein coupled receptor stabilization and crystallization

Marwa Amer

Basel University, Switzerland

Production GPCRs suitable for X-ray structural studies is a challenging subject in the structural biology field because of

the natural abundance and conformation heterogeneity of them. There are currently 52 different GPCRs for which crystal structure has been solved. The development of new methods and improvement of existing GPCR crystallization tools will be of fundamental importance in moving the field forward. The major goal of the project is to develop a new approach as a stabilizing and crystallizing tool for GPCRs. A candidate fusion protein that possesses enormous potential to stabilize a GPCR when inserted into intracellular loops, had been tested in this study. The fusion-protein variants overcome the hurdles associated with GPCRs stabilization and crystallization. It showed a high expression level in most of the tested cell lines. Almost 80% of the receptors expressed to enough quantities requires for crystallization studies. We have used biochemical and structural approaches to study the fusion tool in GPCRs. The fusion candidate increased both solubility and expression of GPCRs in different expression systems and wide range of detergents. Moreover, It showed high stability and crystallization potential.

### Marwa Amer



Marwa Amer received the BSc degree in Biotechnology from the Misr University for Science and Technology, Egypt, in 2009, and the MSc degree

in genetics from the Ain Shams University, Cairo, Egypt, in 2013. In 2010, she joined the Department of Biology, American University in Cairo, as a Research assistant, and in 2011, she became a Teaching Assistant in Faculty of

Biotechnology, Misr University for Science and Technology. Since December 2014, she had been working at Department of Biomedical Sciences, Zewail city for science and Technology where she was an Assistant Lecturer and Researcher. Since 2016, she started her PhD in structural biology, Basel University, Switzerland. Her current research interests include membrane protein functional and structural studies where she is doing her thesis at Paul Scherrer Institute (ETH domain) in Switzerland.

### **Comparative descriptive study of antennal sensilla and ovipositor structure of the Egyptian; *Habrobracon hebetor* and the Indian; *H. hebetor* and *H. galatea***

Amany Nabeih Mahmoud Mansour  
Desert Reserch Center, Cairo, Egypt

*Habrobracon* spp. (Hymenoptera: Braconidae) are important larval parasitoids of a wide range of lepidopterous pests. Adult antennae have various types of sensilla of different functions that direct the adult behavior. Ovipositor plays an important role in host selection, stinging and oviposition. Scanning electron microscopy (SEM) was used to detail structures difficult to be observed under optical microscopy. The morphology of the antennal sensilla of both male and female of *H. hebetor* (Indian and Egyptian strains) revealed the presence of five types of sensilla (sensilla trichodea “the most abundant”; s. chaetica; s. basiconica; s. coeloconica; and

s. placodea). No differences in types, basic structure and shape of antennal sensilla were found between the sexes of both strains. The types of sensilla of both strains of *H. hebetor* were compared with those in other parasitic species (*H. galatea*). The microsculpture of ovipositor sensory equipment of *H. hebetor* (Indian and Egyptian strains) was described from scanning electron microscopy then it was compared with *H. galatea*. This might help towards more understand of host selection process and support the role of the parasitoids to control insect pests.

#### **Amany Nabeih Mahmoud Mansour**



Dr. Amany is working as an Associate Professor for Desert Research Center. This position allowed her to conduct research on plant pests with special concern for the ability of their natural enemies to combat them in order to save cultivated plants from pest damages. Also, Desert fauna diversity is of special importance in our studies and projects. In addition, Training and supervising postgraduate students for biocontrol programs of insect pests and designing integrated control programs for insect plant pests are some of my responsibilities. The aim of the present work was to understand the structure of both antennae and ovipositor of the parasitoid (*Habrobracon hebetor*) using scanning electron microscopy. This will greatly support understanding the host (insect pest) parasitoid (natural enemy of the pest) relationship. Enhancing the role of parasitoids in nature and using them as a tool in insect pest control programs will

save the environment from chemical insecticides hazards and promote sustainable development. This work has been done in cooperation with Dr. Debjani Dey, Principal Scientist and P.I. Network Project on Insect Biosystematics, Division of Entomology, ICAR- IARI, New Delhi, India. This happened while she had a Senior Fellowship funded by CV Raman International Fellowship for African Researchers 2016.

### **Predominant Th1 cytokines in seronegative, aviremic children who exhibit HCV-specific cell-mediated immune responses.**

Maha S. Abdelmegied<sup>1</sup>, Mohamed Hashem, Sayed F. Abdelwahab, Ahmed B. Barakat, Hanaa El-Karaksy, Gehan Galal, Nabil Mikhail, Samer S. El-Kamary, G. T. Strickland and Mohamed T. Shata

The Egyptian holding company for biological products and vaccines (Egyblood/Vacsera), Egypt

A predominant T helper 1 (Th1) response in hepatitis C virus (HCV)-infected adults is associated with viral clearance. We investigated the role of both Th1 and Th2 cytokines in seronegative, aviremic children at high risk of HCV exposure. Peripheral blood mononuclear cells (PBMC) from nine seronegative aviremic children at high risk of HCV exposure, and two seropositive HCV-viremic children were stimulated in vitro with 3 recombinant HCV protein antigens. Supernatants from these cell cultures were tested for Th1 and Th2 cytokines. Significantly higher TNF- $\alpha$  levels ( $p=0.013$ ) in response to NS3/NS4 HCV antigens were detected in the supernatant of the

five CMI responders compared to the four CMI non-responders, and the two viremic siblings. The presence of Th1 HCV-specific TNF- $\alpha$  and IFN- $\gamma$  cytokines in seronegative, aviremic CMI responders suggests they were most likely to have transient infection, and their Th1 immune responses were protective.

### **Maha Sobhy**



Dr. Maha Sobhy has formal academic background includes a B.Sc. in Microbiology /Chemistry, M.Sc. and Ph.D. (Microbiology / Immunology) from Ain Shams University, Egypt and a two years Middle East Research Ethics Training Initiative (MERETI) certificate from University of Maryland, USA. Dr. Maha Sobhy is currently a lecturer of research ethics in the "Biotechnology PhD program", Cairo University, Egypt. She is also a lecturer and a member of the curriculum development committee in the "Arab Research and Ethics Capacity Development Institute (ARECDI)", MERETI / University of Maryland, USA. In addition; Dr. Maha Sobhy is a postdoctoral researcher in VacSera, Egypt. She was secondment as a postdoctoral researcher at Zewail City of Science and Technology during the period of 2015-2017. Dr. Maha Sobhy has the experience in working with infectious diseases such as Hepatitis C virus. She was the immunology team leader in many USAID, EU and Egypt vaccine development cooperation projects. In addition; Dr. Maha investigated other public health problems in Egypt such as inflammatory breast

cancer in women and Hepatitis E virus. In 2017; Dr. Maha Sobhy was nominated as a Fulbright scholar in the Fulbright Junior Faculty Development Program (FJFDP); Public Health/Epidemiology. She received her scholarship at Indiana School of Public Health and City University of New York, USA.

## Let the dead teach the living: Malaria in Ancient Egypt

Ghada Darwish Al-Khafif

Anthropology lab., Centre of Research and Conservation, Ministry of Antiquities, Egypt

Malaria is an ancient disease that is still affecting many countries around the world. In the light of the challenges facing the elimination of the disease such as climatic changes, poverty and resistance to antibiotics, understanding the history of the disease is a must. Malaria was diagnosed by several authors in the human remains of ancient Egyptians. The applied methodologies included immunochromatography, DNA techniques and osteological examination. Some of these researches attempted to interpret the relation between the prevalence of the disease in Ancient Egypt, natural conditions and human-made environmental changes. At the same time, these studies opened the door for further researches. For example, ancient DNA techniques can be used to define ancient strains of the pathogen in order to add new evidences related to its evolution. Also, in the light of the scarcity of studies focusing on hemoglobin abnormalities in Ancient Egypt and the prevalence of these

health problems in modern times, the ancient human DNA researches will provide a chance to reconstruct a more detailed picture about the biological adaptation to malaria through the human history. In addition, many lessons can be revealed through studying the relation between ancient dietary behaviors and disease prevalence. The results of such researches focusing on the “past” can contribute to the advance of epidemiology and related medical sciences, which can provide many opportunities to save the “future”.

### Ghada Darwish Al-Khafif



Ghada Darwish Al-Khafif is a biological anthropologist interested in the studies of bioarcheology of Ancient Egyptians. Through more than 10 years of work in the Anthropology and Mummy Conservation Lab, the Egyptian Ministry of Antiquities, she published researches focusing on many fields such as: helping law enforcement agencies by presenting scientific evidences in criminal cases concerning the authenticity of mummies, diet reconstruction of ancient Egyptians through chemical analysis of archeological bones, and the diagnosis of malaria in ancient human remains. In addition, she participated in the conservation of archeological human remains in many Egyptian museums and excavation sites such as the royal mummies in the Egyptian museum of Cairo. She was a member of the team of the Egyptian Ministry of Antiquities that received the International Council of Museums (ICOM) Egypt Award (2016) for the participation



in the conservation of natural history collections of the Zoological Museum of Giza Zoo.

### **Glucose Homeostasis in Egyptian visceral obese female Adolescents with adenovirus 36 infection**

Sahar A. El-Masrya, Hanan A. El Gamal, Muhammad Al-Tohamy, Ayman Nadab, Amany H. Abdelrahman, Mohamed Kh. Metkees, Amany Ebrahim, Walaa Saad

Medical Research Division, National Research Centre, Egypt

Adenovirus 36 increases adiposity, but enhances glycemic control and reduces hepatic lipid accumulation, despite high fat diet and without recruiting the proximal insulin signaling. Adv36 appears to enhance systemic glycemic control by promoting glucose uptake by adipose tissue and skeletal muscle, and by reducing hepatic glucose output and hepatic steatosis. To investigate the relationship between Glucose Homeostasis, visceral obesity and adenovirus 36 infection in female adolescents. Study Design: A cross-sectional study included 90 females aged 12-15 years. It was conducted at the "Medical Excellence Research Center (MERC)" of the "National Research Centre" (Approval No.15089), during the period between September 2016 and November 2017. Anthropometric assessment was done. Visceral obesity was measured by abdominal ultrasound. Qualitative Human adenovirus 36 antibody was assessed using ELISA.

Fasting serum glucose level, Immunospec insulin ELISA test The HOMA-IR was calculated and complete lipid profiles were done. Girls with visceral obesity had only highly significant lower values of HDL than those without visceral obesity. There were insignificant differences between the 2 groups regarding the other laboratory investigations (fasting blood glucose, insulin, HOMA, cholesterol, triglycerides, LDL). Conclusions: Adenovirus 36 induce a state of normal and sometimes low glucose blood level by pathing insulin signaling which makes adenovirus 36 a noval line of type 2 DM treatment in the future.

### **Walaa Saad Hanafy**



Dr. Walaa Saad Hanafy (1978) is a pediatrician specialized in child and adolescents' health and nutrition; she has M.Sc of pediatrics faculty of medicine Cairo University, PhD from faculty of Postgraduate Childhood Studies Medical Studies Department Ain Shams University. She is researcher at National Research Center NRC, Cairo, Egypt, Biological Anthropology department, Medical Research Division. She shared in many national and international projects aiming to improve the Egyptians children health, the most recent projects titled "united for healthier kids U4HK" and the international project titled "Community outreach approach for having a model of a village controlled from diabetes with improved quality of life: El Ibrahimia El Qebliya village- Damietta governorate-Egypt". She has participated in many

national as well as international conferences as speaker and by posters presentation or by being one of the organizer of some of them. She is JSPS HOPE fellow (Japan society for promotion of science) fellow attended and actively participated at the 9th HOPE meetings with Nobel laureates 2017 Tokyo Japan. She is also member in JSPS alumni society in Egypt. She had many courses in quality and risk management, ISO 9001:2015, as well as the ISO 45001:2015 the standard for the occupational health and safety. She is one member of the internal audit quality team in the medical research division NRC. She had two distance learning courses in the Patent Cooperation Treaty & intellectual property rights from WIPO, Geneva, Switzerland.

### **Combined antiepileptic-anti-inflammatory brain targeting stealth hybrid nanospheres as alternative therapy for conventional anti-neurodegeneration drugs: Anti-Parkinson's as example**

Iman M. Higazy

Department of Pharmaceutical Technology, National Research Center (NRC), Egypt

Parkinson's disease is increasingly propagating, threatening people's quality of life, with its challengeable treatment, owing to severe side effects of marketed drugs; Levodopa. In this study; an anti-epileptic drug; lamotrigine, and a non-steroidal anti-inflammatory drug; tenoxicam, are examined against marketed anti-Parkinson's in their

conventional tablet form and intravenously administered form of Tween-coated pegylated lipid/polymer hybrid nanospheres (HNPs), for their brain targeting and pharmacodynamic efficiency. Single-step nanoprecipitation method was used in preparation; with varying inter-components ratios, with optimization standards set at particle size <100nm and entrapment efficiency >75%. Characterization, in-vitro and in-vivo pharmacodynamic and pharmacokinetic studies revealed that Tween-coated HNPs had significantly higher in-vivo pharmacodynamic effect compared to the non-coated ones, through the former's targeting efficiency and faster onset of action. Controversially; the reverse was observed in-vitro. Increasing lipid ratio within HNPs slowed down drug release in a sustained effect compared to conventional tablets. Lamotrigine Tween coated HNPs showed maximum anti-Parkinson's effect followed by its tenoxicam analogue when compared to L-Dopa. A combined formulation had synergistic anti-Parkinson's effect increasing treatment efficiency when administered once weekly instead of daily SINEMET® intake (combined carbidopa and levodopa).

#### **Iman M. Higazy**



Dr. Iman is a postdoctoral academic researcher at the National Research Center, specialized in the field of pharmaceutical nano-biotechnological applications in drug delivery. She graduated from Faculty of Pharmacy,

Cairo University in 2004 with excellent degree with honor. She also obtained both of her Masters and PhD degrees in Pharmaceutical Sciences (Major) from the same university, where her thesis was awarded as the best PhD thesis in Pharmaceutical Sciences in 2017. During her postgraduate pharmaceutical degrees, she also obtained a graduate diploma in total quality management from the American University in Cairo, and master's in business administration Degree from Edinburgh Business School, Heriot-Watt University in Scotland. She has several national and international participation in scientific projects and conferences as the FIP in 2005, the Brama workshop in Tunisia organized by EFSA in 2012, and extracurricular participation annually in the International Economic Forum in Egypt since 2016. She was also selected among Middle East Youth in year 2016, as one out of ten young cultural and political ambassadors in an exchange program to represent Egypt in the USA, through a fully funded Gabr Foundation East-West Art of Dialogue Fellowship. On December 2018, she was accepted as a member in the OWSD and in the American Association of Pharmaceutical Sciences (AAPS), in addition to volunteering and organizing several cultural, societal and developmental activities and initiatives.

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### **Combined Neurotoxic Effects of Nandrolone Decanoate and Cannabis Extract in the Hippocampus of Adolescent Rats**

Marwa El-Sayed El-Shamarka, Rabab H Sayed, Naglaa Assaf, Hala M. Zeidan, Adel F. Hashish

Department of Narcotics, Ergogenic Aids and Poisons, National Research Center, Egypt

Polydrug use among adolescence is a phenomenon that increased recently causing health and economic problems. Studying the neurotoxic consequences of these combinations in adolescents is important. Cannabis sativa (Can) is the most widely abused illicit drug linked to youth worldwide. Nandrolone decanoate (Nan), one of the most popular anabolic steroids (AS), is widely used by athletes and adolescents. Abuse of AS among adolescence is associated with acts of violence and poly drug use. The present study was designed to study the neurotoxic effects of Nan and Can in adolescent male rats. Nan (15 mg/kg, s.c.) and Can (20 mg/kg, i.p.) were given alone or in combination once daily for one month. Rats were challenged in the open field, elevated plus maze and Morris water maze. Nan induced behavioral and motor abnormalities, increased oxidative stress, elevated brain pro-inflammatory cytokines as well as deleteriously altered brain histopathology and increased brain caspase-3, caspase-8 gene expression and cytochrome c activity. In contrast, Can increased brain proinflammatory cytokines level, caspase-3 and caspase-9 gene expression and cytochrome c activity. However, abuse of both drugs conferred more neurotoxic effects in most parameters.

### Marwa El-Said Ahmed El-Shamarka



Dr. Marwa El-Said Ahmed El-Shamarka was graduated from Faculty of Pharmacy, Cairo University in 1999. She worked at the National Organization of Drug Control and Research (NODCAR) for 3 years till 2003. Then, she quitted and began her research pathway at the national research center. She had her master degree in 2006 and PhD in 2010 from Faculty of Pharmacy, Cairo University. Now, She is an assistant professor in Narcotics, Ergogenic & Poison Department, medical division, NRC, Egypt. She is a member in the Society for Women in Science in Developing Countries-Egypt. Her scientific publications are mainly in drugs, anabolics, addiction, brain neurochemistry and behavior.

### GABA and Vitamin D Levels in Egyptian Polycystic Ovary Syndrome Patients, In relation to Metabolic Profile.

Rasha A. Radwan, Sahar M. AbdelRaouf, Nermeen Z. AbuelEzz

Misr University for Science and Technology, Egypt

Polycystic ovary syndrome (PCOS) is the most prevalent female endocrine disorder worldwide. It is highly associated with infertility, insulin resistance, psychological disturbances and endometrial cancer. Neurotransmitter GABA is a critical player in PCOS pathogenesis, by acting centrally in the hypothalamus. However, there is an obvious lack of research concerning

peripheral GABA in relation to the main findings of PCOS. To the best of our knowledge, this is the first study to investigate serum GABA level and explore its correlation with the hormonal and metabolic profile of Egyptian PCOS patients. Eighty PCOS patients and age-matched healthy females were included in the study. PCOS patients showed significantly low serum GABA level, compared to controls. Interestingly, there was a significant positive correlation between serum GABA and vitamin D levels and a significant negative correlation with testosterone and dyslipidemia. The findings of this study suggest that GABA level contributes to PCOS pathogenesis through its peripheral tissue receptors. Further investigations and adjustment of serum GABA and vitamin D levels can present a promising means for earlier and better management of PCOS manifestations.

### Nermeen Zakaria Abuel Ezz



Dr. Nermeen was graduated from Faculty of Pharmacy, Cairo University and got Master's degree in pharmaceutical sciences, Faculty of Pharmacy, Cairo University in 2007 and PhD degree of Pharmaceutical sciences (Major: Biochemistry) in 2015. She is Lecturer and course coordinator of Clinical Biochemistry course at College of pharmaceutical sciences, MUST University since 2016, and an academic advisor for students of different diversities since 2002. She worked as the head of scheduling committee at MUST University from 2014 -2017 and an organizing

member of the first international pharmaceutical sciences conference, MUST University. She is interested in diagnostic biomarkers for early detection of prevalent disorders in the community, especially neurodegenerative diseases, inflammatory disorders and cancer. She is interested in stem cells research for tissue regeneration in diabetes and inflammatory disorders. Her research experience includes stem cells and tissue culture techniques, nucleic acid isolation and Flowcytometry. She contributed in development of Biochemistry lab for undergraduate students at MUST University and participated in presenting lecture sessions for "Egyptian Pharmaceutical Students' Federation". She is member of OWSD (Women in science for the developing world) organization since 2018 and Post-doc member of the International society of neurochemistry. In 2018, she was awarded the second-place for the best presentation of Epigenetic markers for neurological disorders detection and the first-place award in the neuro-detection case study competition, IBRO, AUC, Egypt.

## Phage Based Detection of Salmonella

Mohamed Raslan, Ahmed Attetf, AlSayed Abd elKareim and Marwa Helal

Next Generation Scientists Program, Academy of Scientific Research and Technology, Egypt

Regional Center for Mycology and Biotechnology, Azhar University, Egypt

Food and Waterborne diseases are major health problem in developing countries

and can have great effect on water supplies. Salmonella have been used as indicator organisms to assess the microbiological quality of drinking-water. Bacteriophage has been used in many protocols to detect Salmonella as cheaper, faster and easier alternative to perform than standard biochemical, serological and nucleic acid-based methods. Nevertheless, despite the great sensitivity of these standard techniques, they still have serious limitations for application. Our protocol developed for detection of viable Salmonella enterica cells using local phage isolates with plaque formation as the end-point assay. Egyptian plant oil extracted by Supercritical fluid method were employed as a virucidal treatment for the complete destruction of exogenous phage without affecting the viability of salmonella cells. Artificially inoculated water revealed the presence or absence of the bacteria after a 12 hour. The protocol was quick and simple to perform than other standard procedures. We have shown that phage have a good detection potential as they are effective against the major serotypes of S. enterica that cause waterborne diseases after application of phage on bacterial lawn. In conclusion, this method could be used as a cheap method detection of Salmonella.

### Mohamed Raslan



Mohamed Raslan finalized his Bachelor of Science degree at Cairo University, Egypt specialized in Biotechnology /

Biomolecular Chemistry. After that, he

worked on his Master of Science degree in Biotechnology at Cairo University, Egypt specialized in Bacteriophage protentional for biocontrol and detection of Salmonella. He currently works as a Research Fellow in Scientists for the Next Generations (SNG) program at the Egyptian Academy of Scientific Research and Technology. During WISWB's first edition in 2017, he was selected to take part in conference organizing committee and he was among a team of four SNG research fellows who won the conference first prize for their outstanding participation in WISWB Education Competition in the same year.

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## Role of DGAT1 level and lipid profiles in HCV infection and progression

Nanis G. Allam, Mohamed L. Salem, Hassan Elbatae and Maii Moustafa Nabieh

Botany Department, Faculty of Science, Tanta University, Egypt

Hepatitis C virus (HCV) is a leading cause of pathogenesis of liver disease. Eventually, studies indicated that lowering both of DGAT1 level and lipid profiles reduce HCV infection and progression. Aim: reduction of HCV infection by lowering DGAT1 enzyme that involves in lipid biosynthesis by probiotics. Methods: a daily capsule (Lactobacillus acidophilus and Bifido bacterium bifidum) (1.5 billion cells) was administrated for a month by patients with chronic hepatitis c before undergoing HCV treatment, blood samples were collected to determine the level of lipid profiles by biochemical tests,

DGAT1 enzyme by ELIZA, HCV particle by Quantitative PCR, thus compared to another group didn't take a probiotics capsule. Results: increasing the response rate to HCV treatment from 70% up to 95% more than those who didn't take probiotics, the reduction of DGAT1 enzyme and eventually lipid profile may clarify this percentage. Conclusion: DGAT1 involved in HCV progression and probiotics are a required supplement in HCV treatment protocol.

### Maii Moustafa Nabieh



Maii Moustafa Nabieh is a PhD researcher in Virology, Microbiology section, Botany Department, Faculty of Science, Tanta University. She has finished

Master's degree in medical microbiology and immunology; also had several studies in biochemistry, molecular biology, pathology and medical lab studies. She attended several international conferences in Egypt in microbiology and biotechnology as a speaker. She worked as medical representative at Bayer pharmaceutical Multinational Company in Cairo and also in several medical labs. She worked in teaching as a microbiology lecturer. She has joined a volunteer teamwork called HCV fighters as active member, Egyptian Researchers association and other volunteering work; she had three published papers and book. She is founder/ Director of Biollix biotechnology start up. Maii has several activities as lecturer, marketer and scientific writer.

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## Promoting Effects of Sunset Yellow, a Food Coloring Azo Dye on Mammary Gland Carcinogenesis.

Elsayed I. Salim, Magdy E. Mahfouz and Malak I. A. Elbassuny

Faculty of Science, Tanta University, Egypt

The purpose of this study is to investigate the role of Sunset Yellow (SY) dye, a widely used synthetic food coloring additive during the promotion and progression stages of chemically-induced mammary gland carcinogenesis in Sprague-Dawley rats. A total of 54 Sprague-Dawley rats were divided to 6 groups, 36 female rats were administered N-methyl N-nitrosourea (MNU) then were divided equally into 3 groups. Rats in group (1) were set on basal diet after MNU injection. Those in group (2) were treated with Sunset Yellow at a dose of 161.4 mg/kg/day, while group (3) were given lower dose of Sunset Yellow (80.7 mg/kg/day) after MNU for 22 weeks. The doses were chosen below the corresponding human acceptable daily intake of the WHO/FAO guidelines adjusted to the experimental animal. Additional control groups were set as follows: Group (4) (n=6) were injected by 0.9% saline and served as non-treated control. Groups (5) and (6) (n=6 each) were administered Sunset Yellow at the same doses as in groups (2) and (3) respectively but without the carcinogen administration. Results: Sunset Yellow in both treatment doses exerted a significant dose dependent increase in tumor incidences, multiplicities, volumes and average tumor burden, as well as it has decreased the tumor latency in SY-treated groups as compared with the MNU

control group. The immunolabeling indexes of the cellular proliferative marker; PCNA, estrogen receptor alpha (ER $\alpha$ ) and progesterone receptor (PR) were significantly increased in groups treated with Sunset Yellow versus control.

### Malak I. A. Elbassuny



Malak holds BSc degree in Biology, Zoology department at faculty of science, Tanta University (2007), then she finished diploma in applied forensic chemistry from faculty of science, Alexandria University (2008). Then, she started her research study in 2013 where she finished pre-Master year in experimental zoology (Genetics) then she started her thesis where she focused on the role of widely used food coloring during the promotion and progression stages of mammary gland carcinogenesis and its co-relation with human breast cancer, and during that she had experience in techniques as RT-PCR, RNA and DNA extraction, primer design, cDNA library, gel electrophoresis, also histopathology classification of tumors and normal mammary gland plus immunohistochemistry. Apart from her study, she is working as a biologist in Central Laboratory for Blood analysis and blood banking since 2010, where she had experience in blood biochemistry techniques, blood analysis tests and parameters, hormones and tumor markers analysis.

## Isolation, identification and characterization of prophylactic and therapeutic probiotics

Mai Nossair Hassan, Ahmed Amer

Pharmaceutical Division, National Research Center, Egypt

Probiotics mean live microorganisms that have beneficial effects on their host's health. In this study, isolates were identified by biochemical and molecular characterization and also probiotic properties of lactic acid bacteria, isolated from the infant's feces. Three of the isolates were observed as potential probiotic. These isolates showed antimicrobial activity against 6 pathogenic strains. They were identified by biochemical characterization techniques and molecular identification using 16S sequencing. Two lactobacilli were identified as *Lactobacillus fermentum* and one was identified as *Lactobacillus gasseri*. In the light of this study, it is observed that, human milk is a source of potential probiotic strains and encoding genes of anti-tumor enzymes.

### Mai Nossair Hassan Ahmed Amer



Mai Nossair Hassan Ahmed Amer is assistant researcher for Chemistry at Natural and Microbial Products Dept., Pharmaceutical Division, National Research Center, Egypt. She received BSc. from Faculty of Agriculture, Biotechnology Program (English section), Cairo University in 2008 and M.Sc. degree in Agricultural Microbiology entitled

"Isolation, identification and characterization of prophylactic and therapeutic probiotics" in 2014. Now, she is phd student at the same faculty with research on production of bioactive compounds as anticancer from probiotics. She has a paper entitled "lactobacilli strains harboring L-asparaginase and arginine deiminase genes from human infant feces for their potential application in cancer prevention."

## Evaluation of the cytotoxicity of Thymoquinone-encapsulated DPPC liposome for the inhibition of prostate and laryngeal cancer cells

Heba Mohamed Fahmy, Nada Reda Abd Elkader, Taiseer Mohamed Abd El-Daim, Ayaat Mahmoud Mosleh, Omnia Eid Ali, Latifa Helmy Ahmed

Biophysics Department, Faculty of Science, Cairo University, Egypt

A great challenge that we affront nowadays is to treat cancer cells without affecting healthy cells. In the present work for the first time, the cytotoxicity effect of free Thymoquinone (TQ) and TQ-encapsulated DPPC liposome was evaluated on prostate cancer cells PC-3 and larynx cancer cells HEP-2 for 24 and 72 hrs, respectively, using MTT assay. TQ (the main active gradient of *Nigella sativa*) was chosen because of its well-known antioxidant, anti-inflammatory and anticancer activities in vitro. DPPC liposome was prepared by the thin film hydration method and its encapsulation efficiency for TQ exceeded 90%. The TQ-



spectrometer, particle size, DSC in addition to zeta potential. From the present results, it was found that treatment of PC-3 and HEP-2 cells with thymoquinone encapsulated DPPC liposome for 24 and 72 hrs at 37°C was more effective than free TQ. On the other hand, TQ- encapsulated DPPC liposome exhibited similar inhibitory effect only at 10-fold higher dose. It is recommended to develop liposome formulations with improved targeting ability to further improve the efficacy of thymoquinone in vivo.

### Taiseer M Abd El-Daim



Taiseer M. Abd El-Daim is currently a Pre-Master Student at Biophysics Department, Faculty of Science, Cairo University. Taiseer was graduated at 2018 with grade Distinction with honor from faculty of Science, Cairo University. She participated in the graduation project (2018) entitled: "evaluation of the therapeutic effect of nanocarrier-encapsulated antidepressant in an animal model of depression". She participated in Education Development System (Smart School Project) in 2013 then, she participated in Arab 7<sup>th</sup> Olympiad in chemistry in the Arab world in 2014. She was an effective member in Egypt Inventors Association at Organization Committee in 2015. She also joined to Biophysical Scientific Society (Research Team) at Cairo University in 2016. She is interested in Scientific Research especially, the field of nanotechnology and Radiotherapy, as she has two international publications. Taiseer and her

group were awarded the prize of best poster in the 6th international conference on modern trends in physics researches that was held from 17th - 20<sup>th</sup> December 2016 - Hurghada – Egypt.

### Myco-gold nanoparticle synthesis by *Aspergillus flavus*: Characterization, optimization and cytotoxic activity

Shimaa Ragab Hamed Ragab

National Research Centre, Cairo, Egypt

Myco-synthesis of stable gold nanoparticles (GNP) using *Aspergillus flavus* filtrate was obtained. Myco-synthesized GNP were characterized by UV-Vis spectroscopy, high resolution transmission electron microscopy (HRTEM), dynamic light scattering (DLS) and FTIR. GNP showed red violet colour with a peak at about 530-540nm as detected by UV-Vis spectroscopy. HRTEM showed spherical, hexagonal, rectangular and anisotropic crystalline nanoparticles with 10-50 nm in size. The size was confirmed by DLS and it was 35.5±15. FTIR analyses of synthesized GNP showed presence of amide and carbonyl functional groups which depicts the presence of peptides that involved in the synthesis and stability of GNP. Nitrate reductase activity was found to be 0.83 µmole/min/ml of filtrate. The optimum conditions for the synthesis of GNP were 10% filtrate, one mM HAuCl<sub>4</sub> in aqueous solution for 30 min incubation at 30°C under static and illumination conditions. GNP synthesized by *A. flavus* filtrate showed a potent cytotoxic effect on both

breast and lung carcinoma human cell lines. However, they were none toxic to normal human cells. This study used a simple, clean, quick and inexpensive synthesis approach for GNP. The synthesized GNP showed anticancer activity and they can be used in biomedical applications.

### Shimaa Ragab Hamed Ragab



Dr. Shimaa Ragab is researcher of Microbial Biotechnology at the National Research Centre in Egypt. She had the bachelor of sciences, department of Microbiology and Chemistry, from Zagazig University, Egypt. Following that, she had M. Sc In Microbiology from Assuit University that was about "Production of Some Compounds of Therapeutic Effect by Fungi from Agriculture and Industrial by-products" and Ph.D in Microbiology from Benha university, Egypt which was titled "Biochemical Studies on some Bioactive Compounds from some Fungi". She worked as assistant researcher in Fungal Physiology Lab., Botany department, Faculty of Science, Assuit University in the period from 2003 to 2006 and as Researcher of Microbial Biotechnology, Microbial Biotechnology Department, Genetic Engineering and Biotechnology Division, National Research Centre (NRC) from 2008 till present. She acts as reviewer for Springer international publisher and science domain international publisher which is an added value to my experience.

### Novel Organocopper derivative induces apoptosis in Human Breast Cancer Cell Lines by Mitochondrial Pathway

Noura Mohamed Hussein Darwish

Faculty of Science, Ain Shams University, Egypt

Background: Survival results in mortality associated with breast cancer are very poor by conventional therapies. Cancer cells exhibit increased intracellular copper accumulation and this fact makes copper coordination complexes promising potent agents with anticancer activity. Methods: In this study, SCP compound was investigated for its cytotoxicity against two breast cancer cell lines (MCF-7 and MDA-MB-231) by MTT assay. Copper also can catalyze oxidation-reduction (redox) reactions which can inadvertently lead to the production of reactive oxygen species, therefore further investigations was performed to examine its effect on oxidative stress and changes on apoptotic gene expression by RT-PCR and confirmed using western blot analysis. Results: It was found that SCP has antitumor activity against both cell lines in comparison to control cells. SCP was found to inhibit Bcl2 and activate P53, caspase-3 and caspase-9 suggesting that SCP may be a good candidate for management of breast cancer patients. Conclusions: This study highlights a clear understanding of copper complex dysregulation of cancer cell growth.

**Noura Hussein Darwish**

Noura is PhD student in Molecular Biology at Faculty of Science, since May 2014. She got master Degree in Biochemistry (Molecular Biology)/ Alexandria University in 2012. She got analytical biochemistry diploma from Alexandria University in 2007 and B.Sc. (Bachelor of Science/ Biochemistry) in 2006. She is member of Egyptian Syndicate of scientific professions and member of Syndicate of Medical Laboratory Specialists. She has practical background in the field of Cancer Research, using Tissue Culture Techniques and its molecular biology applications and experiments. She has experience in handling and propagation of experimental tumor models, such as chemically induced HCC animal models and some molecular biology techniques such as Western blot analysis and agarose gel electrophoresis. She has background of ELISA, practical background on Immunohistochemistry and histology staining, ion exchange chromatography, flame photometry, MA-3000 Mercury Analyzer. DNA, RNA extraction and gel electrophoresis, real time hematological analyses, blood biochemical and immunological analyses and other body fluid analyses.

**Viral entry and RNA replication inhibition of hepatitis C virus in cell culture by microbial extract**

Naiera Mohamed Helmy Mohamed

Genetic Engineering and Biotechnology Research Division, National Research Centre, Egypt

The emergence and distribution of Hepatitis C virus (HCV) infection are still considered unsolved problems and scientific research has been focusing on the discovery of new safe and efficient antiviral drugs. As being full of side effects many synthetic drugs have been avoided and replaced by new biologically derived ones. This study included the use of microbiologically derived extract to be used as HCV viral replication inhibition agent in cell culture system. Several factors for the culture of *Pseudomonas oleovorans* were studied and the optimum growth conditions were chosen for the extraction of antiviral substance. *Pseudomonas olverance's* extracted fractions were prepared as reviewed in previous work using different concentrations of chloroform: methanol on silica gel columns. In addition, the selected bacterial fraction was analyzed by GC/MS and the results showed abundance of tetradecanoic and hexadecanoic acid methyl esters. The selected fraction was tested against HCV in vitro using two different protocols, viral attachment entry inhibition (Pre-incubation) and viral replication inhibition (Post infection). 0.1 µg / ml of the selected antiviral fraction resulted in inhibition of viral replication in Huh7.5 cells. On the other hand using higher concentration didn't cause any viral inhibition. The selected bacterial fraction

containing tetradecanoic acid and hexadecanoic acid methyl esters could be used as a promising candidate to inhibit viral HCV entry and replication of HCV.

### Naiera Mohamed Helmy Mohamed



She started her carrier in Natural and Microbial products chemistry in 2008 in which she was awarded her master's degree in Microbiological and biochemical studies on calcium lactobionate production by some bacteria from Faculty of Science, Ain shams University. In 2009, she started working on her Ph.D. in microbial biotechnology in microbiological studies and evaluation of the antiviral activity of some bacterial extracts. She joined microbial biotechnology department, National Research Center as Research Assistant on September 2013 and still working there as Researcher from April 2016. Purifications and identification of metabolic products from bacterial isolates and their antimicrobial, antiviral and anticancer activities are her major scientific interests.

### **In vitro evaluation of cytotoxic effect of combining two LNA-Gapmer antisense oligonucleotides against Telomerase RNA component (hTR) and mRNA of centromere protein B (CENP-B) in Hepatocellular carcinoma cells.**

Ahmed M. EL-Desoky, Yasser BM. Ali, Roba M. Talaat

Genetic Engineering and Biotechnology Research Institute, University of Sadat City, Egypt

Current cancer treatment tactics ought to be selective to carcinogenic cells and non-destructive to normal cells. Telomerase is a ribonucleoprotein enzyme which plays a crucial role in maintaining the malignancy and is responsible for cellular immortality and tumorigenesis. While it is not found in somatic cells, its reactivation is obligatory in malignant cells to maintain the length of the telomere and prevent its senescence. Antisense-based strategies against human Telomerase RNA component (hTR) led to cancer cell death at some time after administering of antisense oligonucleotide (ASOs), and this lag time is one of the major drawbacks for this approach in treating cancer. On another hand, Centromere protein B (CENP-B) plays an important role in cell cycle regulation. CENP-B is highly expressed in cancer cells helping in high rate proliferation. Materials and Methods: HepG2 cells were transfected with several concentrations (6.25, 12.5 and 25 nM) of LNA ASO against hTR and CENP-B mRNA either individually or in combination. MTT assay was used to assess the Hep-G2 cytotoxicity 24 and 48 hrs post-transfection. Telomerase activity, hTR, and CENP-B mRNA were measured by reverse transcriptase-polymerase chain reaction (RT-PCR). Effect of antisense treatment on Caspase-3, Bax, and Bcl-2 was also investigated by RT-PCR. Transforming growth factor (TGF- $\beta$ ), Tumor necrosis factor (TNF- $\alpha$ ) and, Nitric oxide (NO) were estimated in supernatant collected 48 after transfection with ASOs

by enzyme-linked immunosorbent assay (ELISA). Our study conclusively demonstrates that using a single treatment with LNA ASO- hTR or CENP-B led to dose and time-dependent reduction in HepG2 cell viability. The combination of two LNA antisense (hTR + CENP-B) with different concentrations showed a synergistic cytotoxic effect. LNA ASO treatments (6.25 nM from each) exhibit the greatest synergistic cytotoxic effect. hTR and CENP-B mRNA in HepG2 cells were totally abrogated. Telomerase activity was disappeared. Expression of Caspase-3, Bax, and Bcl-2 was not detected after transfecting cells with LNA ASO hTR alone or in-combination with LNA ASO CENP-B indicates to caspase-independent cell death. A significant decrease in TGF- $\beta$  and TNF- $\alpha$  and elevation in NO secretions was observed. Conclusion: LNA ASO hTR is potent in decreasing telomerase activity with a rapid anti-tumor effect with Caspase-independent cell death. This tumor inhibitory effect was magnified by ASO CENP-B indicating to the synergistic cytotoxic effect of oligonucleotides combination at certain concentrations. The rapid inhibitory effects of combined oligonucleotides on tumor growth open a new prospective application of antisense in cancer therapy.

### Ahmed M. EL-Desoky



Ahmed started his career at drug research & development center SIGMA Group and he was enrolled in a Professional program at the Institute of

Statistical Studies and Research (Cairo University) to advance his career as a researcher. Then, he joined multinational company Hikma Pharmaceuticals in the drug research & development department to gain more skills. Currently, he is enrolled in a master's program in the immunology department of the Genetic Engineering and Biotechnology Research Institute at Sadat City University and he finished his theoretical and practical courses. His goal is to find a new method for cancer treatment by using a combination of two Antisense LNA Gappers to target the Telomerase enzyme and prevent the formation of the kinetochore/centromere complex which is required to segregate chromosomes during cancer cell division. The strategy behind his idea is to test the synergistic and selectivity effect of Gappers as therapeutic agents to correct mutations and the abnormal expression of cellular genes in tumor cells by decreasing the gene expression.

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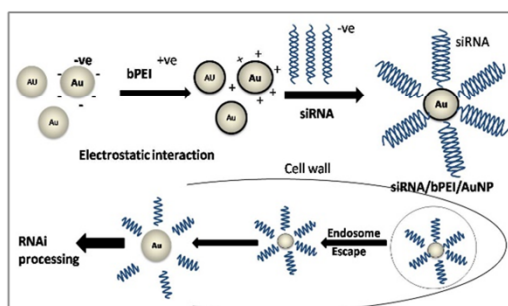
### Modified gold nanoparticles for intracellular delivery of anti-liver cancer siRNA

Hanan Shaat, Amany Mostafa, Moustafa Moustafa, Amira Gamal-Eldeen and Mahmoud Elhefnawi

Medical Research Centre of Excellence, National Research Centre (NRC), Egypt

To overcome the rapid enzymatic degradation and low transfection efficiency of siRNA, the delivery carriers for siRNA is a therapeutic demand to increase its stability. Gold nanoparticles (AuNPs) modified by branched

polyethyleneimine (bPEI) were developed as an efficient and safe intracellular delivery carriers for siRNA. The current study implied that siRNA designed against an oncogene c-Myc could be delivered by a modified AuNPs complex without significant cytotoxicity. The comparative semi-quantitative and quantitative real time PCR were used to measure the c-Myc gene expression after transfection with naked siRNA and siRNA/bPEI/AuNPs, but AuNPs interfered with PCR. However, the c-Myc protein translation was successfully detected in the transfected HuH7 cells with naked siRNA and siRNA/bPEI/AuNPs and it was found to be inhibited by siRNA/bPEI/AuNPs more than naked siRNA. The results validate the successful silencing of c-Myc gene. Accordingly, it may confirm the promising and effective delivery of siRNA by bPEI/AuNPs. The complex enhances the cellular uptake of siRNA without significant cytotoxicity and confirms that bPEI modified AuNPs could be used as a good candidate for safe



cellular delivery of siRNA.

**Schematic illustration** of the formation of polyelectrolyte complex siRNA/bPEI/AuNPs by electrostatic interaction between siRNA and bPEI capped AuNPs.

## Hanan Shaat



Hanan got her BSc. of Microbiology and Chemistry from faculty of science, Benha university (Egypt), and diploma of analytical biochemistry in 2009 from Menufiya University, Egypt. She got a master's degree in chemistry in 2016 from Benha University entitled: Use of metallic nanoparticles for delivery of anti-liver cancer siRNA. Through this study she could gain a valuable experience in bioinformatics, molecular biology and nanotechnology. The key aspects in her master thesis helped her to publish an article in international journal of pharmaceuticals. She was awarded the prize of the best article from Al-Najah National University in 2018. She won a qualifying program scholarship offered by Misr Elkheir foundation in Egypt that supported her to take an IELTS and GRE exam and scientific research training program. She gained high experience in the medical analysis field as she works for more than 10 years in different laboratories in Egypt.

## Influence of Urban Design on Pain and Disability in Women with Chronic Low Back Pain in Urban Cairo

Maha E. Ibrahim, Mona Abdel Aziz

Department of Physical Medicine, Rheumatology and Rehabilitation, Suez Canal University

Chronic low back pain (CLBP) is a challenging health condition. Poor correlation between pain and disability on one hand, and biological factors on the

other has led to emergence of the biopsychosocial model to explain the interaction between pain and psychosocial factors. The built environment exerts a significant effect on physical and psychological health. This study investigates the relationship between these built environment and experiences of women with CLBP. This study is an exploratory mixed design study, where 27 women with CLBP living in two neighborhoods in Cairo (Old and New Maadi) were interviewed. We examined their perceptions of the built environment, and how it affects their physical and psychological health. We also measured their pain levels, their disability, and their mood states. Women were found to have moderate pain and mild disability and no psychiatric co-morbidities. Most of them did not feel that elements of their environment affected their CLBP. However, ugly, distorted or uncomfortable elements constantly affected their mood, and were perceived as a source of stress. Urban design does not exert a direct effect on CLBP. However, the perception of women regarding these elements affected their mood states, and how they handled stress.

### Maha E. Ibrahim



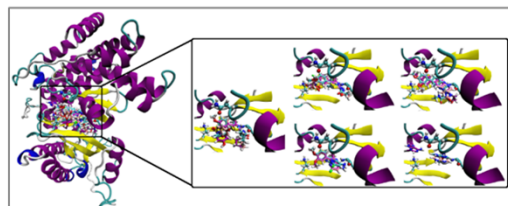
Maha is lecturer of Physical Medicine, Rheumatology and Rehabilitation, Faculty of Medicine, Suez Canal University. She had a diploma in Research Methods, from the American University in Cairo, a Certificate in Research Ethics from the University of

Maryland and a Professional Diploma in Monitoring and Evaluation from the American University in Cairo. Currently, she is pursuing an online master's degree in health sciences from the University of Maryland, USA. She has special interest in investigating Rheumatic diseases, especially chronic back pain. She has one journal publication and 5 poster presentations in international conferences. She is also interested in mentoring medical students and young doctors on pursuing a career in scientific research and in medicine.

### Identification of novel Plasmodium falciparum PI4KIII $\beta$ inhibitors as potential anti-malarial drugs: homology modeling, molecular docking and molecular dynamics simulations

Mahmoud A. A. Ibrahim, Alaa H. M. Abdelrahman, and Alaa M. A. Hassan

CompChem laboratory & Chemistry Department, Faculty of Science, Minia University, Egypt



The aim of the current study was to discover selective pfPI4KIII $\beta$  inhibitors as potential anti-malarial. A comparative model of pfPI4KIII $\beta$  was first constructed. Performance of Autodock4.2 and Vina4 software in predicting the inhibitor-

PI4KIII $\beta$  binding mode and energy was assessed based on two Test Sets: Test Set I contained five ligands with resolved crystal structures with PI4KIII $\beta$ , while Test Set II considered eleven compounds with known IC<sub>50</sub> values towards PI4KIII $\beta$ . The outperformance of Autodock4.2 was reported.

Pharmacophore-based screening was then conducted to identify drug-like molecules from ZINC database with physicochemical similarity to two potent pfPI4KIII $\beta$  inhibitors –namely, cpa and cpb. For each query inhibitor, the best 1000 hits in terms of TanimotoCombo scores were selected and subjected to molecular docking and molecular dynamics (MD) calculations. Binding energy was then estimated using molecular mechanics–generalized Born surface area (MM-GBSA) approach over 50 ns MD simulations of the inhibitor-pfPI4KIII $\beta$  complexes. According to the calculated MM-GBSA binding energies, ZINC78988474 and ZINC20564116 were identified as potent pfPI4KIII $\beta$  inhibitors with binding energies better than those of cpa and cpb, with  $\Delta G_{\text{binding}} \geq -34.56$  kcal/mol. The inhibitor-pfPI4KIII $\beta$  interaction and stability were examined over 50 ns MD simulations. The selectivity of the inhibitors towards pfPI4KIII $\beta$  over PI4KIII $\beta$  was reported.

### Alaa H. M. Abdelrahman



Ms. Alaa H. M. Abdelrahman graduated in 2018, with a B.Sc Degree in Chemistry, from Faculty of Science, Minia University. Ms. Alaa has joined CompChem laboratory as a researcher since June 2015 under "CompChem-

Talented Students Incubator Program". Her interests focus on computer-aided drug discovery. Ms. Alaa participated in many conferences with oral presentations such as 3<sup>rd</sup> and 4<sup>th</sup> Young-Researchers Conference and 5<sup>th</sup> Cairo International Exhibition of Innovation. One of her projects was funded from the Academy of Scientific Research and Technology (ASRT) under supervision Dr. Mahmoud A. A. Ibrahim. She is looking for utilizing her skills and experience to make advance in her scientific field She hopes to develop a novel methodology in the discovery of many drugs for various and fatal diseases.

### Potential Reach of Mobile Health for Educating, Empowering and Engaging Chronically Diseased Patients: Evidence from a Survey in Egypt

Rehab A. Rayan

High Institute of Public Health, University of Alexandria, Alexandria, Egypt

Patient education includes multiple interventions for teaching patients about their health to improve their outcomes. The term has evolved to the more active terms (patient engagement and empowerment). Patients, who are diagnosed with chronic diseases that cost patients lifelong treatment and dangerous complications (e.g. Diabetes Mellitus) need to be responsible for their health by self-management. With more computers and mobile devices owners globally, telehealth offers promising healthcare technology interventions to improve patient's health literacy. This study



involves a structured questionnaire administered online to examine the level of acceptance to use mobile technology (a form of telehealth approaches) to deliver health-related education. We collected data through a survey targeting a sample of 56 Egyptian patients aged between 25 and 65 years old in 2014. The results showed a promising acceptance rate (63%) among respondents; mostly those aged between 25-35 years agreed to use mobile technology like Short Message Service (SMS) to deliver health-related educational information to improve their self-managing experience and health outcomes. We conclude that accompanying the rise in mobile phones subscription and willingness to receive health-related SMS, mobile health presents an opportunity for health education programs, especially when targeting younger adults. These findings emphasize the potential to introduce more individualized, innovative and engaging approaches to educate and leverage patients with their own health using technology in a developing country. We recommend further studies to evaluate the effect of mobile-based patient education on a sample of chronically diseased patients (e.g. diabetics patients) to measure the desired outcomes such as lifestyle and self-care behaviours (medication adherence, improved knowledge, satisfaction and quality of life).

### Rehab A. Rayan



Rehab is a Counseling & Health Promotion officer at Caritas Egypt implementing UNHCR programs regarding the provision of subsidized primary healthcare to support refugees. She is also a PhD Researcher in Public Health, major Epidemiology and PharmD holder. She was chosen as Egypt's global peace ambassador for the Global Peace Chain (GPC), a certified GIZ trainer & certified Egyptian Health Informatics Fellow, teaching in Health Informatics Fellowship and supervising graduates' Projects and a trainer of trainers on the ICDL Health Information System Usage. She is also a Research & Statistics Coordinator in Humanity Lab Foundation (HLF), Research & Development Associate at Ain Shams University, Peer reviewer at URNCST Journal, Social Media Associate at the ArabWIC & the Global People's Summit (GPS), Field Researcher at Shamseya for assessing Egypt hospitals' services, Educator Translator & Reviewer in Usable Knowledge Learning Community at Harvard Graduate School of Education, Health Promotion Specialist at Resala Charity Organization, and multi-civic local & global organization volunteer. She attended multi-disciplinary training courses, conferences & workshops, projects along with research experiences. She has +3 years of experience as a health informatics specialist in the National Information Center for Health & Population (NICH), Egypt (instructor, trainer, and researcher). She co-designed & trained the workforce of the first phase of the national project "The

comprehensive health Insurance” in Port Said. She has also planned and executed the annual technology-training plan for the Ministry of Health & Population(MOHP), Egypt. She assisted with planning and launching the first Health Informatics Diploma in Egypt. She has also +4 years’ experience as a clinical pharmacist in the MOHP, a team leader & co-founder of the clinical pharmacy department, the Drug Information Centre (DIC) in a local hospital in Alexandria, Egypt; initiator of the clinical pharmacy practice in the artificial Kidney Unit of the same hospital and a continuous medical educator for the clinical staff.

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## Statistical Analysis of Biospeckle Images Produced by Biological Tissue

Doaa Youssef

National Institute of Laser Enhanced Science (NILES), Cairo University, Egypt

Biospeckle image is a chaotic and irregular pattern produced when highly monochromatic and coherent light incident on a biological tissue, diffuse object. It can provide useful information concerning the structure or the movement of the biological tissue components. Since the biospeckle imaging is safe, non-destructive and non-expensive optical method, it has been widely applied to medicine, biology and agriculture for evaluating different types of biological tissues. For capturing the biospeckle images, a simple experimental configuration consisting of a laser, imaging lenses and a CCD camera is

utilized. The biospeckle images have to be processed by means of accurate statistical analysis to extract the involved information for proper evaluation of the biological tissue. In this study, first, an experimental setup for acquiring multiple biospeckle images at once from many cross-section areas of bovine articular cartilage tissues was proposed. Second, a new statistical analysis model based on local contrast measurement was investigated on the acquired biospeckle images for significantly accurate estimation of the average roughness of the various cross-section areas of the articular cartilage tissue surface.

### Doaa Youssef



Doaa Youssef received her B.Sc. from the department of biomedical engineering, faculty of Engineering, Helwan University, Cairo, Egypt in 2004. She joined the department of Engineering Applications of laser (EAL) at the National Institute of Laser Enhanced Science (NILES), Cairo University, Giza, Egypt in 2009 and received her M.Sc. degree in 2013 from NILES. Doaa Youssef is currently a lecturer assistant of biomedical engineering at NILES. Her research interests are in laser and its application in biomedical engineering, medical imaging and statistical analysis using digital image processing and pattern recognition. In her master thesis she proposed a new technique to track and investigate the retina by sending multiple of laser spots at once. In this study, she proposed a software that could determine the positions of laser spots according to

the disease. After detecting the anatomical structures and lesions. Currently, Doaa Youssef is working in her Ph.D. In her study, she estimates the average roughness of articular cartilage tissue by laser speckle imaging by means of texture analysis.

### **Association of Dopamine DRD2 Taq1A Polymorphism with Autism Spectrum Disorder in a sample of Egyptian Autistic Children**

Ghada H. El Nady, Mona I. M. Saleh, A.Z.E. Abdelsalam

Faculty of Medicine, Ain Shams University, Egypt

Autism spectrum disorder is a complex neurodevelopmental disorder, which has a strong genetic background. The DRD2 is one of the major investigated genes which are involved in neuropsychiatric disorders. This study aimed to evaluate the frequency of dopamine D2 Taq1A polymorphic genotypes among autistic children (mean age  $4.57 \pm 1.69$  years) (144 males, and 42 females) and 186 normal control group of matching age and sex. Autistic patients were diagnosed by DSM-IVTR criteria. Childhood autism rating scales (CARS) and Stanford Binet intelligence scale were performed. RFLP-PCR was carried out to study DRD2 Taq1A polymorphism. We found that the frequency of the A1 allele (62.9%) in the patients is higher than control group (14.78%) ( $P < 0.01$ ). Moreover, the frequency of the A1 allele was 85.7% in the moderately delayed patients. There was strong evidence that

the A1 allele might be a risk factor for autism and might be related to the moderately delayed autistic patients. Abbreviation List: DA: Dopamine, DRD2: Dopamine D2, ASD: Autism spectrum disorder, RFLP: Restriction fragment length polymorphism, PCR: Polymerase chain reaction, IQ: intelligence quotient

### **Ghada H. El Nady**



Dr. Ghada H. El Nady was employed as Assistant researcher in Ain Shams Center for Genetic engineering and biotechnology, Ain Shams University, Cairo, Egypt. She got the M.Sc. degree in 2000 in Molecular genetics. She became Research assistant from 2000 until she obtained her Ph.D. in 2003 in Molecular Genetics. From 2003, she worked as a researcher in the same center. From 10/2003 to 10/2005, Dr. Ghada H. Elnady traveled to Japan as a visiting researcher at Natural Science Center for Basic Researcher and Development, Hiroshima university, Japan. From 2010 till 2017, she became a fellow at Medical Genetic Research Center, Faculty of Medicine, Ain shams university. From 2018 till now, she became assistant consultant at the same center. Dr. Ghada H. Elnady got many training courses in Molecular genetics. From 12/10/2001 – 15/3/2002, she traveled to Canada and got long bench training course in “Functional Genomics” in Department of Biological Sciences, Quebec university, Montreal, Canada. Dr. Ghada H. El Nady has many expertise and research interest in Molecular diagnosis, Cell culture, Genomics, Molecular genetics, Gene expression, Bioinformatics.

## THE MISCONCEPTIONS ABOUT PHYTOESTROGENS

Dalia Abdulazim El-Khouly

Faculty of Pharmacy, Al-Ahram Canadian University, Egypt

Phytoestrogens are plant derived compounds that are functionally and structurally related to human estrogens. Asian women have low incidence rates of breast cancer, osteoporosis, cardiovascular diseases and post-menopausal symptoms. Phytoestrogens are found in soy which is the cornerstone of the Asian diet. For instance, isoflavones including genistein and resveratrol are phytoestrogens. Genistein inhibited the activity of tyrosine kinases (TKs) slowing tumorigenesis in breast cancer cells and halted the vascularization of tumors. It also inhibited DNA topoisomerases I, II and matrix metalloproteinases. Resveratrol, found naturally in grapes, mitigated insulin and cholesterol levels while upregulated the Sir2 gene responsible for the benefits of caloric restriction. Unfortunately, phytoestrogens act also as endocrine disruptors and can cause adverse effects. The widely used sports drinks and energy bars contain protein isolate with 90% soy protein can affect the brain and the reproductive ability. Pregnant women should limit their intake of soy foods and be aware that soy formula is not always suitable for their babies. Phytoestrogen-rich infants' formulas can have negative impact on their future reproductive health. However, the fact that phytoestrogens

intake is rapidly increasing, enhanced the demand to critically evaluate their potential health effects.

### Dalia Abdulazim El-Khouly



Dr. Dalia El-Khouly is lecturer of Pharmacology and Toxicology at the School of Pharmacy, Al Ahram Canadian University (ACU). She is member of the International Pharmaceutical Federation (FIP) and the Egyptian Society of Pharmacology and Experimental Therapeutics (ESPET). In addition, she is the executive member of community service and environment development committee (CSEDC) at Al Ahram Canadian University (ACU). She succeeded to join UN Women as she is concerned about African women issues. She received her PhD degree in Pharmacology and Toxicology from Faculty of Pharmacy, Ain Shams University, 2017. Her PhD thesis entitled "Studying the effect of deferiprone in immunological model of liver fibrosis". Her master was about the "Pharmacological study of protective mechanisms of thymoquinone in experimentally induced lung fibrosis model". Her research experiences focused on the downregulation of the fibrogenesis pathways via multiple mechanisms, attenuating the oxidative stress and the subsequent inflammatory cascade as well as hampering the production of profibrogenic factors, through studying the different signal transduction axes assessed by different techniques. She is interested in teaching oncology and the recent pharmacotherapies in cancer. She did an agreement between ACU and the combating and treating addiction fund.

She organized awareness campaigns and medical conveyances. She aims to benefit from the conference and training in her network which includes students, colleagues and our society.

### **Cardenolides: Insights from chemical structure and pharmacological utility**

Eman A. Taher

National Organization for Drug Control and Research (NODCAR), Egypt

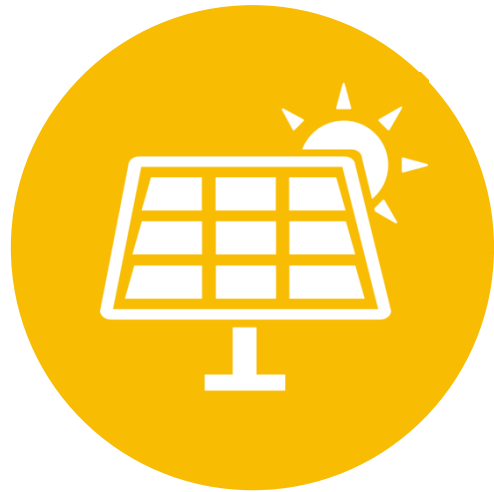
Cardiac glycosides (CGs) are a class of naturally occurring steroid-like compounds, members of which have been in clinical use for more than 1500 years. Their folk uses include arrow poisons, abortifacients, heart tonics, emetics, and diuretics. The major current use of CGs is because of their ability to inhibit membrane-bound Na<sup>+</sup>/K<sup>+</sup>-ATPase enzyme, which is regarded as an effective treatment for congestive heart failure (CHF), cardiac arrhythmia and atrial fibrillation. Furthermore, increasing evidence points to potential cytotoxic effects of CGs against various types of cancer. In this research, we highlight some structural features of this class of natural products that are crucial for their efficacy, some methods of isolation from natural resources, and structural elucidation tools. We also describe the physicochemical properties space and several modern biotechnological approaches for CG production without the need for plant resources.

### **Eman A. Taher**



Eman Taher is a second year doctoral student in Chemistry Department at Faculty of Science, Minufiya University, Egypt. Her research is focused on the

evaluation of bee products potential as a source of novel biologically active molecules that can be used as leads or tools for medical applications, in particular, natural products with anticancer activity. Eman was a research fellow at KTH and BMC in Sweden between 2011 and 2012. She is now occupied a permanent position in National Organization for Drug Control and Research (NODCAR), Egypt responsible for drug quality control in addition to research works. She has five years of working experience mainly in analysis of raw materials and pharmaceutical products using different techniques and instruments, internal audit for applying ISO, and implementing current Good Laboratory Practice (GLP) regulations related to quality control work. Eman is responsible for reviewing, evaluating and approving the final released reports about the finished products, alongside with preparing and reviewing Standard Operation Procedure (SOP's). Beside her work in NODCAR, Eman has published work in Q1 international Journals. Recently, she published a chapter in Elsevier in the series of "Studies in Natural Products Chemistry" and a review about cardiac glycosides in Pharmacological Research



3<sup>RD</sup> INTERNATIONAL CONFERENCE FOR WOMEN IN SCIENCE NETWORK

WORLD FORUM FOR WOMEN IN SCIENCE

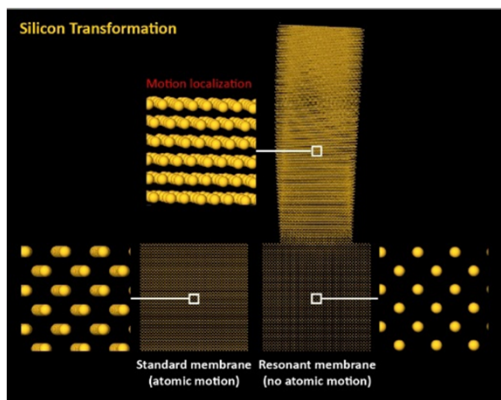
## Track 2: Material – Engineering - Energy

## Track 2: Materials Science - Engineering - Energy

### Phonics: A new silicon revolution on the horizon

Mahmoud I. Hussein

Smead Department of Aerospace Engineering Sciences, University of Colorado Boulder, USA



Silicon, a material in abundance filling the world's deserts, has given us three transformational revolutions: the development of glass, computer chips, and solar cells. Here we overview an emerging field, phononics, that promises to add one more revolution to silicon's triumphant list. Phononics seeks to elucidate the nature of intrinsic mechanical motion at the atomic scale, and use this knowledge to develop new artificially structured materials with properties far superior than existing materials. In this talk, a new paradigm

developed at the Phononics Laboratory at CU Boulder will be presented: resonant thermal transport in nanophononic metamaterials [1,2]. This invention, which is realized by nanostructuring of single-crystal silicon, is poised to double the conversion efficiency of thermoelectric devices—a technology that allows us to cleanly harvest electricity from heat in the solid state. Given that over 60% of the energy generated globally is wasted as heat, this new form of silicon has enormous potential for economic and environmental impact.

### Mahmoud I. Hussein



Mahmoud I. Hussein is an Associate Professor and the Alvah and Harriet Hovlid Professor at the Department of Aerospace Engineering Sciences at the University of Colorado Boulder. He also holds a faculty affiliate appointment at the Department of Applied Mathematics, and serves as the Faculty Director of the Pre-Engineering Program at the College of Engineering and Applied Science. He received a BS degree from the American University in Cairo (1994) and MS degrees from Imperial College, London (1995) and the University of Michigan–Ann Arbor (1999, 2002). In 2004, he received a PhD degree from the University of Michigan, after which he spent two years at the University of Cambridge as a postdoctoral research associate. Dr. Hussein's research focuses on the dynamics of materials and structures, especially phononic crystals and locally resonant phononic metamaterials, at both the continuum

and atomistic scales. His approach to phononics is rather broad ranging from vibrations of aerospace structures to lattice dynamics and thermal transport in silicon-based nanostructured materials. His studies are concerned with physical phenomena governing these systems, relevant theoretical and computational treatments, and analysis of the effects of dispersion, resonance, dissipation and nonlinearity. Recently he has also been conducting experiments to support portions of the theoretical work. Dr. Hussein received a DARPA Young Faculty Award in 2011, an NSF CAREER award in 2013, and in 2017 was honored with a Provost's Faculty Achievement Award for Tenured Faculty at CU Boulder. He has co-edited a book titled Dynamics of Lattice Materials published by Wiley. He is a Fellow of ASME and an associate editor for the ASME Journal of Vibration and Acoustics. In addition, he is the founding vice president of the International Phononics Society and has co-established the Phononics 20xx conference series which is widely viewed as the world's premier event in the emerging field of phononics.

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## Water Anomalies: From Ice Age to the Carbon Nanotubes

Marcia C. Barbosa

Universidade Federal do Rio Grande do Sul, Brazil

Water is ubiquitous in nature; however, it exhibits more than 70 unusual properties. The more common is the density. The

solid phase of water floats into the liquid phase what does not happen in most of the materials. Thanks to this property life survives the glacial times. Recently it was found that water also moves fast under nano confinement. We show, using molecular dynamic simulations, that we can use the super flow of water under confinement to build membranes made of graphene and molybdenum disulfide which separate water from salt and that this mechanism becomes even more efficient in the presence of multivalent ions.

### Marcia C. Barbosa



Prof. Marcia is the director of the Brazilian academy of sciences. She is full professor at Universidade Federal do Rio Grande do Sul and she is a Brazilian physicist. She studied through theory and simulations the thermodynamic and dynamic behavior of complex fluids such as water, charged colloids and biomolecules. Her group addresses questions such as how the anomalous behavior of confined water can be used to understand biological and geological systems and can be employed as the building blocks to the design of drug delivery strategies and to water desalination. In addition, she is also involved in understanding the gender unbalance in exact sciences. For her work in water, she got the 2013 L'Oréal-UNESCO prize on women in physical sciences and for her work on gender issues she got the 2009 Nicholson Medal from the American physical society.



Currently, she is the director of the Brazilian Academy of Sciences

## Unbiased Spontaneous Solar Fuel Production Using Stable Earth-Abundant Nanofiber Composites

Nageh K. Allam

School of Sciences and Engineering, The American University in Cairo, Egypt

There is a growing need for new techniques to synthesize metallic copper nanoparticles due to their remarkable use in many advanced technologies. Herein, a novel method to synthesize stable and non-agglomerated zero-valent copper nanoparticles (ZVCNPs) via the in-situ formation of reduced graphene oxide (rGO) during the electrospinning process in the presence of polyvinylpyrrolidone (PVP) as a carbon source is presented. X-ray diffraction (XRD), Raman spectroscopy, electron paramagnetic resonance (EPR), transmission electron microscopy (TEM), and x-ray photoelectron spectroscopy (XPS) techniques were used to investigate the morphology, structure, and composition of the fabricated materials. The synthesized ZVCNPs were coupled with TiO<sub>2</sub> nanofibers and rGO to form an efficient photoactive material to photocatalytically produce hydrogen via water splitting, resulting in 344% increase in the hydrogen yield compared to that of TiO<sub>2</sub> nanofibers. The density functional theory (DFT) calculations showed that the ZVCNPs enhance the charge transfer and lower the energy needed for photocatalytic water splitting. This study

suggests a novel method for metallic copper stabilization and illustrates the effect of metallic copper as a catalyst for the in-situ formation of rGO.

### Nageh K. Allam



Nageh Allam received his PhD in materials science and engineering from Pennsylvania State University and pursued his postdoctoral studies

at both Georgia Institute of Technology and Massachusetts Institute of Technology (MIT). He joined the faculty at The American University in Cairo (AUC), where he is currently an Associate Professor with tenure. Allam's research is multidisciplinary in nature as it is at the interface between nanoscience, physics and chemistry. It deals with the development of a set of synthetic and fabrication techniques to obtain well-designed nanostructured materials with composition, size and shape control for use in energy conversion and storage, sensors applications, biomedical applications, among others. The research comprises both experimental and theoretical activities. He has published more than 150 papers in reputed peer-reviewed international journals and has authored more than 100 conference articles. He is the recipient of the Ford Foundation international graduate fellowship, RAK-CAM postdoctoral fellowship, the World Academy of Sciences (TWAS) Yong Scientist Award, the Showman Foundation Award in Applied Sciences, the State of Egypt Award in Advanced Technological Sciences and the

AUC Excellence in Research and Creative Endeavors Award.

## **Studies on hybrid polymeric nanocomposite coatings (PNC) having superior anti-corrosion performance and hydrophobic nature**

**K. Ramesh, Sh. Ammar, I. A. Wonnie Ma**

Department of Physics, University of Malaya, Malaysia

Polymeric based nanocomposite coating systems (PNCs) have been fabricated using epoxy resin and polydimethylsiloxane (PDMS) with different weight ratio of SiO<sub>2</sub> nanoparticles. Modifier used in the coating system will be studied and the influence of embedding nanoparticles into the polymeric matrix. The developed coatings have been characterized by X-ray diffraction (XRD), contact angle measurements (CA), field emission scanning electron microscope (FESEM), and electrochemical impedance spectroscopy (EIS). The surface and the structural studies showed the formation uniform layer and fine dispersion of nanoparticles. The coating showed hydrophobic nature by confirming the contact angle value above 130°. EIS results confirmed the corrosion protection performance of the coatings developed.

## **Ramesh Kasi**



Dr Ramesh Kasi graduated PhD from University of Malaya in 2007. His research interests focus with emphasis on electrochemistry

applications in polymer materials which are used in energy storage systems and corrosion protection. He is teaching undergraduate and postgraduate level students. He has served as Program Coordinator, Treasurer for the research centre, Course file coordinator, Curriculum Review Committee for MSc Applied Physics and Industrial Training Coordinator. He has published more than 80 research papers in high ranked journals having 420 citations and H-index of 13. He has been successful in securing substantial funds for research from University of Malaya (UMRG and UMRP) and Malaysian government funding agencies (FRGS). Recently, he has been selected for Erasmus project for Capacity Building in Higher Education. He has got 1 Malaysian patent granted and 1 local and 1 international patent filed for his credit. He is also a senior member in leading professional association (American Institute of Chemical Engineers) and member in NACE International and International Electrochemical Society. He has received several awards and medals in participating international technological expo including ITEX, PECIPTA and BioMalaysia. He won the Best of the Best in electrical and electronics category at PECIPTA 2013. Recently he won The Best Award in MTE 2016 with gold medal. He has been awarded as the Best Reviewer of the year 2015 by Emerald Publications. He

has involved in organizing international conferences (ICFMD 2013, 2015 Solar Asia 2013) and participated as panel of judges in national science fair for children.

## Water disinfection by low cost hybrid clay photocatalysts

Emmanuel I. Unuabonah and Andrea S. S. de Camargo

University of São Paulo, São Carlos – SP, Brazil

Safe and clean drinking water is becoming a valuable and scarce asset due to increase in industrial activities, population and environmental deterioration. Water contaminants can be chemical or biological and the latter are constituted by harmful living organisms whose metabolic products are the primary cause of infectious diseases leading to high morbidity and mortality in Sub-Sahara Africa. Almost two billion people drink water contaminated with feces and an estimated 2,000 children under the age of five die every day from diseases linked to contaminated water, lack of sanitation, and hygiene. Multidrug-resistant bacteria in potable water has been recognized by WHO as one of the top threats to human health. Within United Nation's Goal #6, this work- a collaboration between Redeemers' University and the University of São Paulo, presents the development of nanoporous photocatalytic composites able to work with natural sunlight in disinfecting pathogen polluted water. Low cost materials are prepared from clay and agrowaste, doped with transition metals,

and fully characterized inclusively to their capacity for singlet oxygen generation targeted at exterminating enteric gram-negative bacteria: *Escherichia coli* (*E. coli*), *Vibrio Cholerae* and *Salmonella typhirium* (*S.typhi*). Results on disinfection efficacy, material–bacterial interaction and regeneration of the nanocomposites will be shown.

### Andrea S. S. de Camargo



Andrea S. S. de Camargo received her B.S. and M.S. degrees in Chemistry from the State University of São Paulo (UNESP) and her Ph.D. in Applied

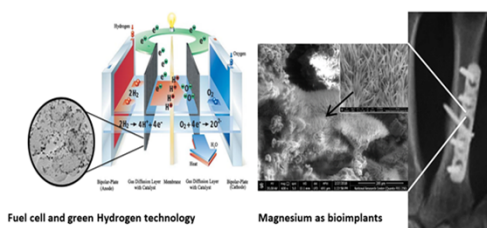
Physics from the University of São Paulo (USP) in Brazil. She was a postdoctoral fellow at USP and the Federal University of São Carlos (UFSCar), and spent three years as a visiting researcher at the University of Muenster in Germany, initially as an Alexander von Humboldt scholar and then as a CNPq fellow. Currently, she is an Associate Professor at USP and the head of the Laboratory of Spectroscopy of Functional Materials (LEMAF). Her research interest lies on the design, synthesis and structural-functional correlation of luminescent and optical materials (glass and transparent glass ceramics doped with rare earth ions, and host-guest materials based on mesoporous silicate hosts loaded with highly luminescent guest species), through several spectroscopic techniques. She was awarded the L'ÓREAL Prize for Women in Sciences 2007 in Brazil and was an affiliated member of the Brazilian Academy of Sciences (2008-2013). Since 2007 she has been a CNPq research productivity recipient. In 2016-17 she was

part of the Gender issues workgroup of the Brazilian physics society.

## The technologies and challenges in the 21st century, the ability to design new materials and to have green source of energy

Ahmed Abd El-Aziz

German University in Cairo, Materials Engineering dept., New Cairo, Egypt



Fuel cell and green Hydrogen technology

Magnesium as bioimplants

Fuel cell and green Hydrogen technology: The low temperature fuel cell (FC) is one today's most promising clean energy technologies in the search to overcome both the energy reserve crisis and environmental pollution. To date, FC technology has been extended to a wider scope of applications, with the potential to power a range of devices from mobile phones and laptops to cars, buses, boats, houses, as well as space shuttles. With the rapid technical advances of recent years, the FC has been extensively demonstrated worldwide in many application fields and is now on the verge of commercialization. In terms of fuel cell efficiency, catalyst processing and development is very important, where catalyst accounts for 55% of the total cost of the fuel cells.

Magnesium as bioimplants: Magnesium alloys have received considerable attention over the past years especially Mg-Ca alloy. The previous studies show that Mg alloys are promising biodegradable implant material as it is considered a light material with mechanical properties close to the natural bone (for some alloys of Mg) which avoid stress shielding. Also, they are biodegradable materials that dissolve in the human body eliminating the need for surgeries to remove the implants after the required time for healing. However, the obstacle that is facing this alloy is its high degradation rate which must be controlled to be used as a biomedical material.

### Ahmed Abd El Aziz



Prof. Dr. rer nat. Ahmed Abd El Aziz (A.M. El Aziz) is currently vice dean for student affairs, Faculty of Engineering and Materials science, German University in Cairo. He obtained his Ph.D. from TU Dresden, Germany 2000 followed by the postdoctoral work which was carried out in Ulm University up till 2004. His research activity extended to cover the aspects of electro-chemical reactions, metal passivity, functional materials (magnetic materials, nanomaterials and glassy metals), electro-catalysis and thin film, single crystals including oxidation- reduction reactions and development of low temperature fuel cells. Additionally, his research included waste water treatment, materials for water declination and environmental energy. Much interest has been given to study catalyst behavior, green energy and hydrogen production.

## Reporting on an implicit, finite-volume scheme to model sea ice dynamics

Alfred Bogaers

Council for Scientific and Industrial Research,  
South Africa

Sea ice plays an important role in global climate. It influences global ocean circulation, moderates global climate, and is one of the most important indicators for climate change. Due to the reflective nature of sea ice, large amounts of incoming solar radiation, within the polar regions, is reflected away from the earth's surface. As the sea ice extent shrinks, more open water is directly exposed to sunlight which in turn leads to greater energy absorption. This forms a positive feedback loop, where small changes in the sea ice extent leads to a further acceleration of climate change. Sea ice is a heterogeneous, anisotropic material, and generally forms a highly fractured surface. However, at length scales of 10 to 100kms, as is typically used in global climate models, it is generally accepted that sea ice can be appropriately described as a continuum medium. This talk will share some of the challenges and insights learned while developing an implicit, finite-volume based model, to approximate sea ice dynamics. The numerical model is based on a viscoplastic (VP) material description, which is widely used in sea ice modeling. While the VP material description has been shown to accurately model global sea ice deformation, it tends to become numerically unstable. This talk therefore aims to introduce the concept of dynamic

relaxation, which in addition to matrix conditioning, can be used to both stabilize, and accelerate, the iterative convergence behavior.

### Alfred Bogaers



Dr. Alfred Bogaers is currently the head of the multi-physics group at ExMente Technologies, South Africa. His research interests include multi-

physics modeling, computational fluid dynamics, fluid-structure interactions and numerical optimization. Bogaers is the recipient of the Joseph Arenow prize for the best PhD thesis within the Faculty of Engineering and Built Environment at the University of Cape Town (2015), as well as the Sasol Medal and Prize for best Master's student within the department of Mechanical and Aeronautical Engineering at the University of Pretoria (2011).

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## Holey-Graphene as a Platform for Nano-Biosensing

Amal Kasry

Faculty of Engineering, British University in Egypt (BUE), Egypt

Interface engineering for Biosensing is one of the most important applications that requires materials with tunable properties while exhibiting the ability to be chemically modified. Metal plasmonics have been widely investigated for this

several drawbacks including; high cost, lack of tunability and their intrinsic losses. The urge to search for new materials for gas and sensing application has become an ultimate requirement. In this work I will show our efforts in the group to investigate new materials, e. g. graphene, to be used in biosensing applications. Graphene has been recently demonstrated as a new emerging plasmonic material that experience surface plasmons in the mid IR wavelength range. Due to its high field confinements and tunability upon different doping concentration, graphene demonstrates a good candidate for sensing application. Meanwhile, graphene as being transparent material that defies any serious attempts for mid-infrared absorption. In this work, we show probing localized surface plasmonic resonance (LSPR) in graphene patterned with nano holes without any external applied voltage or using metallic layers. By designing graphene patterned with nanoscale holes of specific dimensions, LSPR is excited at particular wavelength, leading to noticeable absorption. We use finite difference time domain to investigate the excitation of LSPR in nano meshed graphene at the mid IR wave length range with absorption value reaching 35 %. We also mapped the electromagnetic field distribution and find out that the LSPR is localized at the nano holes' edges. Our findings would promote graphene in Biosensing applications.

### Amal Kasry



Amal Kasry received her PhD (2006) in Materials Science at the Max Planck Institute for Polymer Research (MPIP) in Mainz, and the Johannes Gutenberg University, Mainz, Germany. Her major work was in the field of optical biosensors based on surface plasmon fluorescence spectroscopy (SPFS). After a one-year postdoc at the MPIP, she was a postdoc fellow at the Center for Cell Analysis and Modeling (CCAM) at UConn health center, Connecticut, USA, where she worked on live cell imaging by dark field light scattering. She was then appointed as a research associate at the department of Bioscience in Cardiff University, UK, during that time she led the activities of designing biochips based on DNA Nanotethers to study protein-protein interactions on the surface in collaboration with GE Health Care. In 2009, she was appointed as a senior research scientist in the Egypt nanotechnology Center (EGNC) in a collaboration project between the Egyptian government and IBM Research; she performed her research at IBM T. J. Watson Research Center in Yorktown Heights, NY, USA. During this time, besides performing her research related to carbon nanomaterials, specifically graphene, she was involved in the strategic conceptual design of the EGNC in Cairo. After a short time as a senior research scientist in the R&D division of the Nitto Denko Asia Technical Center (NAT) in Singapore, she joined the Biosensor Technologies Department at the Austrian institute of Technology (AIT)

in Vienna as a scientist to work on OFET biosensors besides graphene related research. Currently she is a member of the Basic Science Department at the faculty of Engineering, the British University in Egypt. Dr. Kasry is a corresponding author and co-author of several peer reviewed articles and holds several patents and patent applications in the fields of photonics, optical biosensors, protein-protein interactions, fluorescence spectroscopy and carbon nanomaterials. She is also an author of one book and co-author of five book chapters. She was an invited speaker and organizer of several international meetings and institutes. She is also a reviewer for AIP, ACS and Wiley, and DAAD. Dr. Kasry received a fellowship for her PhD from Max Planck Society and has several awards and recognitions inside and outside Egypt.

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## Coalition of Faradaic Electrode Material with Tunable Ionic Polymer Electrolyte for Supercapattery – A Novel Hybrid Device

Fatin Saiha Omar, S. Ramesh

Department of Physics, Faculty of Science, University of Malaya, Kuala Lumpur 50603, Malaysia

The revolution of electrical storage technology to generate electricity is being aggressively pursued. Electrical double layer capacitor (EDLC) is a fast-charging alternative which by principle is cheaper and more sustainable than battery. However, several EDLC units need to be connected in series to produce high

voltage which consequently mitigate the energy density and elevate the internal resistance of the system. One strategy to circumvent these drawbacks is by coupling different natures of electrodes (i.e. battery-type and capacitive electrodes) in one device to build supercapattery. Herein, supercapattery comprising faradaic nanostructured materials and carbon-based electrodes in conjunction with a flexible gel polymer electrolyte (GPE) was designed. The GPE was modified with additives to acquire higher ionic conductivity, better salt dissociation, improved thermal and chemical stability and lower interfacial resistance between GPE and electrodes. The nanostructure electrode materials enable short ion diffusion path as well as large faradaic and electrostatic contributions by fast surface reactions. The structure, chemistry and morphology of each supercapattery components were analyzed via various characterization techniques. The temperature-dependent ionic conductivity and dielectric properties of the GPE which can reveal critical insights on ion mobility mechanism, segmental motion and electrical relaxation of the GPE were investigated.

### Ramesh T Subramaniam



Prof. Dr. Ramesh T Subramaniam has contributed greatly in the field of polymer electrolytes as a source of energy for electrochemical devices. He has published more than 200 research articles with

citation more than 3500 with h-index of 31. He has filed numerous patents and received many accolades as a distinguished scholar. He was selected as a 'TWAS Young Affiliate Fellow' in 2009. In 2010, he received the Pacifichem Young Scholar Award from the American Chemical Society and in 2011, the Young Scientist Award from IUPAC. In 2012, he received the IAP Young Scientist Award and in 2013 selected as a Young Scientist of the Global Young Academy (GYA). In 2014 he was selected as one of the Top Research Scientists Malaysia. In 2016 he was elected as a Fellow of the Academy of Sciences Malaysia and received the "International Association of Advanced Materials Scientist Medal". In 2017, he was conferred the "Established Scientist Award" by Royal Society and elected as a Fellow of Royal Society of Chemistry. He is a recipient of the Fulbright Fellowship 2017 with a tenure at the Princeton University, USA and a recipient of the International Senior Research Fellowship at Durham University, UK in 2018.

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### **Determination of Lead and Cadmium contents in Lipstick and their potential health risks to consumers in Kumasi**

Marian Asantewah Nkansah

Kwame Nkrumah University of Science and Technology, Kumasi-Ghana

The purpose of this study was to assess the levels of some toxic metals in lipsticks sold at different markets and shopping

malls in the Kumasi Metropolis of Ghana. Twenty lipstick brands were analysed by acid digestion and use of atomic absorption spectroscopy (model 210 VGP) to determine lead (Pb) and cadmium (Cd) levels. The concentrations of Pb and Cd in lipsticks ranged from  $0.20 \pm 0.00$  to  $36.70 \pm 0.26$ , and  $1.83 \pm 0.06$  to  $412.23 \pm 0.40$  mg kg<sup>-1</sup>, respectively. Lead concentration of 18 lipsticks was below the recommended limits of the United State Food and Drug Administration (20 mg kg<sup>-1</sup>), Ghana Standards Authority (1 mg kg<sup>-1</sup>) and Canadian Health (10 mg kg<sup>-1</sup>). The Cd concentration in 19 lipsticks was above the Health Canada threshold for impurities, indicating a toxicological effect for lipstick users. The HQ for Cd in almost all the lipsticks were above 1, indicating adverse non-carcinogenic health risk exposure to Cd via ingestion. Thus, the continuous usage of these brands of lipsticks can pose a high risk of Cd on human health. There is the need for regular monitoring of lipsticks for all toxic heavy metals to ensure consumer protection.

### **Marian Asantewah Nkansah**



Dr. Nkansah holds a PhD in Environmental Chemistry from the University of Bergen (Norway). She obtained her BSc. Chemistry and

MSc. Environmental Chemistry from the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana where she is currently a senior lecturer. She has more than a decade's experience in academia, has a considerable number of publications to her credit and has rendered services to



her community in various ways. She teaches Practical Chemistry, Nuclear/Radiochemistry, Chemistry and Society, and Petroleum Chemistry. Her research interests span a wide range of fields including finding solutions to environmental problems associated with levels and fate of toxic substances like heavy/trace metals, persistent organic pollutants (POPs) and polycyclic aromatic hydrocarbons (PAHs) in food, water, soil, rocks, sediments and other environmental matrices. Dr. Nkansah was named the inaugural recipient of the FM Al-Kharafi TWAS Prize in 2016 in recognition of the impact of her research on environmental heavy metals. She is committed to the mentorship of female university students as well as role model for young girls at the basic level of their education. She enjoys teaching and loves to share her experiences with the people she meets. She also enjoys traveling and hiking.

## **Polymer Nanocomposites: Nanosynthesis, Fabrication, Characterization and Applications**

Usama F.M. Kandil

Egyptian Petroleum Research Institute, Cairo, Egypt

While the use of hard and soft nanoparticles in producing toughened polymer nanocomposites is not new and has been recently reported in the literature, the use of functionalized nanoparticles toughened polymer nanocomposite to produce multi-scale engineering materials like Fiber

Reinforced Polymers (FRP) Polymer Concrete (PC) and Recycled Wooden Plastics (RWP), that are relatively new and can lead to significant industrial advancement stemming from our ability to engineer a new generation of polymer nanocomposite materials. This new generation of polymer nanocomposites are engineered to accomplish properties that are not attainable using classical polymer chemistry. The new multi-scale composite being FRP, PC or RWP will enable expanding the use of polymers in applications were not possible because of the limited strength and energy absorption of classical polymers or regular polymer composites. We review here synthesis, fabrication and characterization of different types of polymer nanocomposites with the intention to be used in multi-scale composites including FRP, PC and RWP and with superior mechanical characteristics beyond what can be produced using typical polymer materials.

### **Usama F.M. Kandil**



After obtaining his BS degree in Chemistry from Cairo University in 1988 with honors; Dr Kandil has been employed as a research assistant at the Egyptian Petroleum Research Institute (EPRI) in 1988 where he continued his graduate study with connection to Cairo University, and obtained MS degree in Polymer Science in 1997. Then, he was promoted to an assistant researcher at EPRI (1997-2001). In 2001, he was awarded a scholarship from the Egyptian Government to pursue

his graduate study in the United State. In fall of 2001, he enrolled in the Polymer Science Program of the Material Science and Engineering Department at the Pennsylvania State University (PSU) and he received another MS degree in 2004 followed by receiving his PhD in Material Science and Engineering at PSU in August 2005. He was promoted to the Assistant Professor degree in 2011 and then he was promoted to the Professor degree in 2017. He is a member of the American Chemical Society, Division of the Polymer Chemistry and the Division of Polymer Materials. In 2008, he started a successful international collaboration between EPRI and the University of New Mexico (UNM) when he was awarded a junior post-doctor researcher grant to visit UNM to participate in nanocomposite research. This six month visit, January to June 2010, was funded by STDF Junior Scientist Program. Following this visit and through this collaboration; Dr. Kandil was successfully awarded a couple of funded projects: US-Egypt (STDF/NSF), Center of Scientific Excellence (STDF-CSE) and Sustainable Development of Sinai (STDF-SDS) funding programs and successfully established the Center of Scientific Excellence of Polymer Nanocomposites (PNC) in 2013 and he is the Director of that center. He has lots of scientific publications in highly ranked journals. He also obtained two US-Patents and one Egyptian Patent and he has one chapter in a book: Carbon Fibers, Edited by Jonathan Phillips, Edition 2015 - Chapter 1: "Improved Strength and Toughness of Carbon Woven Fabric Composites with Functionalized MWCNTs". Dr Kandil and his research team have done a workshop in his Center (PNC) at EPRI in 7-8/12/2016;

titled: "Next Generation of Polymer Nanocomposites for Sustainable Development in Egypt".

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## **Computational modeling as a value-add in energy storage materials**

Regina Maphanga

Council for Scientific and Industrial Research,  
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Computer modeling has been identified as a key area of growth worldwide and is increasingly becoming a driving force in the discovery and design of novel materials. Currently, computer simulation methods are influencing all areas of study, with a great impact in materials physics and chemistry. With the advancement of computing powers, complex materials and their properties are increasing investigated. Methods such as density functional theory, ab-initio, molecular dynamics, energy minimization, many-body perturbation theory and quantum Monte Carlo are employed to simulate materials for various applications. The search to improve and optimize electrochemical properties and structural characterization of battery materials is a subject of intense scrutiny. However, this has proved challenging because of the complex and preparation-dependent microstructure of battery materials. Computer simulation methods can aid experiments unravel the structural complexity of materials by generating atomistic models and calculating their physical properties. In this paper, specific examples of simulating energy materials using high performance computing tools

are presented. A systematic strategy - analogous to methods widely and routinely used to model crystal structure, is used to generate the bulk and nanostructures of selected based battery materials. Specifically, the symmetry associated with the nanostructure coupled with basis nanoparticle is used to prescribe models of various nanostructural architectures. Molecular graphic images, showing the atom positions for the microstructural features together with the simulated XRD patterns they give rise to, are presented and compare favourably well with experimental results.

### Regina Maphanga



Dr. Regina is a principal researcher at the Council for Scientific and Industrial Research in South Africa. She was an Associate Professor of Physics at the University of Limpopo, SA. Also, she was appointed as a Junior Associate at the Abdus Salam International Centre for Theoretical Physics in Italy. She is an alumni member of South African Young Academy of Science and Global Young Academy. She is an Honorary Secretary and Executive Council Member for South African Institute of Physics; and an international Steering Committee Member for the workshop on Women in High Performance Computing during Supercomputing and International Supercomputing conferences. She is a founding member of University of Limpopo Women Academic Solidarity Association. Recently, she was elected a member for C20 Commission on Computational Physics of International

Union of Pure and Applied Physics (IUPAP). She received distinguished several awards for her outstanding achievements. She actively shared in promotion of public understanding of science, engineering and technology in SA. Regina participated in World Economic Forum and BRICS Young Scientists' Forums. She is involved in various outreach activities on encouraging youth to become future scientists and often writes science communication essays for Science Magazine of AAAS.

### New Green technique for identifying and removing pharmaceutical residues from municipal wastewater

Ramia Albakain

Department of Chemistry, The University of Jordan, Jordan

The lack of water has severe impacts on domestic needs and industrial productivity. Increasing anthropogenic activity has many effects on human health due to the emissions of toxic compounds. The emission of harmful substances as toxic heavy metals and pharmaceutical residues results in serious threats to human health. Platinum group elements PGEs (Pt, Pd, Rh, Ru, and Ir) are also considered as wastes. Hospitals are significant source of environmental pollution with PGEs since anticancer drugs used in chemotherapy departments. These compounds are released directly to municipal wastewater systems without

organisms and thus can constitute a serious health risk. Nowadays, nanofiltration technology has gained attention in toxic heavy metal removal from wastewater due to the: high removal efficiency, low cost, and environmentally friendly. Herein, for the first time, a new and cheap synthesized hollow fiber membrane was generated. The formation of the cross linking can be confirmed using FTIR. The morphology of the hollow fiber membrane was observed by SEM. The results showed high efficient rejection of the hollow fiber membranes to heavy metals that exist in wastewater. This approved the new era of cheap, safe and simple methods for wastewater treatment.

### Ramia Albakain



Dr. Ramia Albakain holds a PhD with honor degree in Analytical and Bio-analytical Chemistry from Université Pierre et Marie Curie (UPMC) and Ecole Supérieure de Physique et de Chimie Analytique (ESPCI), Paris – France (2011). Dr. Albakain is currently an associate professor at the University of Jordan-Jordan, Department of Chemistry since 2012. Dr. Albakain was the recipient of L'Oreal-UNESCO for Women in Science Fellowships in 2015. Dr. Ramia received 17 international awards and fellowships in less than 4 years as Fulbright fellowship, award of the Academy of Medical Sciences/ Daniel Turnberg Fellowship- UK, TWAS Young Affiliates (2016-2020), etc. She got TWAS Prize for Young Scientists in Developing Countries, Elsevier Foundation- TWAS Sustainability Visiting Expert Program fellowship and IUPAC Periodic Table for Younger Chemists. Dr. Albakain is leading 13 international scientific projects and

published 18 articles in reputable international journals.

### Drag Reduction using Mixed Anionic Polymer and Cationic Surfactant

Nermine. E. Maysour, S. M. Elsaeed, E. G. Zaki

Petroleum Application Department, Egyptian Petroleum Research Institute (EPRI), Egypt

Turbulent drag reduction behaviour of a mixed anionic polymer/cationic surfactant system was studied in a pipeline flow loop to explore the synergistic effects of polymeric and surfactant drag reducing additives. The anionic polymer used was poly acrylamide. The surfactant used was cationic ethene, di1-(2-aminoethyl)-1-dodecyl-2-methyl-4,5-dihydro-1H-imidazol-1-ium chloride at concentration levels of 1000 and 2500 ppm. While the relative viscosities demonstrated a weak interaction between the polymer and the surfactant, the surface tension measurements exhibited negligible interaction. The pipeline results show a considerable synergistic effect, that is, the mixed polymer–surfactant system gives a significantly higher drag reduction (lower friction factors) as compared with pure polymer or pure surfactant. The addition of surfactant to the polymer always enhances drag reduction. However, the synergistic effect in mixed system is stronger at low polymer concentrations and high surfactant concentrations.

### Nermine Maysour



Nermine Maysour Refaat is a professor and deputy head of Petroleum Applications Department at Egyptian Petroleum Research Institute (EPRI).

Nermine published several researches in international journals related to polymers and their applications in petroleum sector. She has supervised many theses in different topics. Nermine has a patent that is granted from The Academy of Scientific Research and Technology (ASRT), Ministry of State for Scientific Research for the invention a Method of Preparation of Petroleum preservative Core during drilling process. She is a member in the Egyptian society of corrosion, a member in the Egyptian society of polymer science and technology (ESPST), a member in the Egyptian society for environmental sciences, a member in international union of pure and applied Chemistry| (IUPAC), and a member in Tank Service Center at EPRI. She was a session chair at First International Conference for Women in Science Without Borders (WISWB) Egypt.

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### Top quark physics with CMS experiment at LHC

Dr. Shima Abu Zeid

Faculty of Women for Arts, Science & Education, Ain Shams University, Cairo, Egypt

The Standard Model (SM) of Particle Physics is an extremely successful theory that provides accurate description of many phenomena that are experimentally observed in fundamental interactions. The SM is not a complete theory of the nature. Some phenomena are not embraced in the SM like gravity, composition of dark matter and neutrino masses. These shortcomings motivate scientists to search for physics Beyond the Standard Model (BSM) at the Large Hadron Collider (LHC) at CERN. The LHC is a proton collider where the protons are accelerated and finally collided with each other at four experiments located underground. This produces a huge variety of elementary particles including the top quark. The top quark plays a key role to search for new physics phenomena. Being the heaviest particle in SM, physicists believe that it has an enhanced sensitivity to various new particles and interactions suggested by BSM theories. One of interesting possibilities is the presence of flavour-changing neutral current (FCNC) interactions between the top quark and the Higgs boson. The observation of a SM-like Higgs boson by ATLAS and CMS experiments in 2012 initiated the study of this FCNC interaction. My research at CERN concerns an experimental research for FCNC interaction involving a top quark and a Higgs boson with a signature of two leptons in the final state with equal electric charge. Significant improvements are developed with respect to previous searches for FCNC interactions with the same final state.

### Shimaa Abu Zeid



The first Egyptian being a tour guide at Compact Muon Solenoid (CMS) experiment at CERN (European Organization for Nuclear Research), where she guides visitors coming from worldwide inside different places (on surface & underground) of CMS. Furthermore, she was the first Egyptian being a Detector Control and Safety (DCS) technical shifter at CMS experiment, which means she has the responsibility for controlling the CMS sub-systems and the connection between CMS and the LHC (Large Hadron Collider) machine from the control room of CMS experiment. Moreover, she has to assure safety conditions to provide a safer working environment in CMS during the operation period. Dr. Shimaa had her B.Sc. of Science (Physics) and M.Sc. of Science in Experimental Nuclear Physics from Faculty of Women for Arts, Science and Education - Ain Shams University. Her Master study focused on nuclear interactions used for production of medical and/or industrial radio-isotopes, this work has been done in collaboration with cyclotron project - Egyptian Atomic Energy Authority (EAEA). She started her PhD as an Erasmus Mundus student with joint-supervision agreement between Vrije Universiteit Brussel (VUB) – Brussels, Belgium and Ain Shams University (ASU) – Cairo, Egypt. Hence, she obtained Double-Degree of Ph.D, one in Science from VUB and Ph.D in Nuclear Physics from ASU. Her PhD focused on the study of top quark properties experimentally with the CMS

experiment at CERN. During PhD, She has participated in several international conferences and workshops in Belgium, France, Netherlands, Czech Republic, Germany and South Korea where she has presented the updated results of her research on top quark physics. She is a coauthor in CMS physics papers since 2015, with 435 peer-reviewed publications. Dr. Shimaa now is a professor Assistant of nuclear physics at faculty of Women for Arts, Science & Education – ASU. Also, she is a council member of Egyptian Network of High Energy Physics (ENHEP). ENHEP is running under the umbrella of the ministry of Higher Education and Scientific Research and the Academy of Scientific Research & Technology (ASRT) and is the official representative of Egypt in CMS collaboration. Shimaa was the official representative of teaching Assistants in the faculty board during 2012-2013 and the representative of ASU in the Union of Young Faculty during 2011-2013.

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### Structural / electronic amendment of Pt nanoanodes for boosting the performance of formic acid fuel cells

Ahmad M. Mohammad, Islam M. Al-Akraa

Chemistry Department, Faculty of Science, Cairo University, Cairo, Egypt

The development of efficient and stable Pt/Au/MnO<sub>x</sub> nanostructured anode for the formic acid electro-oxidation (FAO) was aimed for its potential application in the direct formic acid fuel cells (DFAFCs) which represent a convenient replacement for the traditional hydrogen fuel cells (HFCs) in harvesting clean electricity for several portable and stationary applications. While HFCs experience troubles with the H<sub>2</sub> use, storage and transportation, the DFAFCs enabled the direct use of liquid fuels without a reformer (a reactor for H<sub>2</sub> production) and offered the potential for enhanced cell performance by lowering the fuel crossover. However, unfortunately, the catalytic activity of platinum (that typically represents the anodic catalyst in DFAFCs) deteriorates rapidly due to the accumulation of poisoning CO. This consumes the active Pt sites, which are supposed to participate in the corresponding anodic reactions; lowering significantly the overall cell efficiency. The current investigation suggests a synthetic methodology to mitigate the CO poisoning by a dual modification of Pt nanoparticles with gold nanoparticles (nano-Au, ensemble effect) and manganese oxide nanostructures (nano-MnO<sub>x</sub>, bifunctional effect). This modification succeeded to achieve both a poisoning mitigation and an improvement of the anodic reaction's kinetics.

### Ahmad M. Mohammad



Prof. Ahmad M. Mohammad received his BSc in 1995 from the Faculty of Science at Cairo University (Chemistry major). At

that time, he was appointed as a TA in the Chemistry Department at Cairo University. He was awarded his MSc (Surface Chemistry) and PhD (Nanotechnology) from Cairo University, respectively in 1999 and 2004. In 2001, he joined the Pennsylvania State University as a research assistant for two years. In 2005, he received a research fellowship for two years from Tokyo Institute of Technology in collaboration with Sanyo Electric Co., Ltd. He worked (in a sabbatical leave) for Qassim University (KSA/Assistant Professor/from 2007-2009) and British University in Egypt (Egypt/ Associate Professor/ 2011-2015). Currently, he is a Professor of Physical Chemistry at Cairo University. His main research deals with fabrication of hybrid nanomaterials for water treatments and energy conversions. He co-authored so far 59 research papers and book chapters in prestigious international journals at Elsevier, Springer, American chemical Society, Royal Society of Chemistry and participated in 84 of famous international conferences, symposia, and workshops. He acts as well as a reviewer for several international journals and societies.

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## Design of an eco-friendly stable photocatalyst

Hassan A. Abd El-Rehim, El-Sayed A. Hegazy, Sahar A. Ismail<sup>1</sup>, El-Sayed A. Soliman, Noha M. Deghiedy

Radiation Research of Polymer Chemistry Department, National Centre for Radiation Research and Technology (NCRRT), Atomic Energy Authority, Cairo, Egypt

Environmental hazard caused due to the release of dyes in effluents is a concern in many countries. Among the various methods to combat this problem, Advanced Oxidation Process, in which semiconductor photocatalysts are used, is considered the most effective one. These materials release Reactive Oxygen Species (ROS) such as hydroxyl radical and superoxide in suspension that degrade the dyes into non-toxic minerals. However, this process requires UV light for activation, which uses <5% of the solar light. Hence, there is a need to develop materials that have better photocatalytic abilities, both in the UV region and in the visible light, so that the efficiency of dye removal is enhanced. Towards this objective, we have synthesized a series of Polyaniline–TiO<sub>2</sub> (PANI–TiO<sub>2</sub>) nanocomposites as photocatalysts for the degradation of organic pollutants. We used gamma radiation to modify the electronic structure of the photocatalyst to broaden the spectrum from the UV region into the visible one. The maximum photocatalytic degradation of as-prepared PANI-TiO<sub>2</sub> photocatalyst was found to be 84% within 240 min, whereas a removal efficacy of 97% within 150 min was noticed in the case of irradiated photocatalysts. The irradiation of the prepared

nanocomposite is convenient, direct and environmentally friendly. The study reports a highly efficient composite photocatalyst for the degradation of contaminants that can be applied to cleaning up the environment.

### Noha Mohamed Deghiedy



Dr. Noha is Lecturer at polymer chemistry department, national center for radiation research and technology, atomic energy authority, Egypt. In 2015, she received her PhD. in Polymer Chemistry from Chemistry Department, Faculty of Science, Ain Shams University. During her PhD, she was mainly dealing with the assessment of high-energy radiation processing as “elective” large-scale process for polymers formation and applications. Her earlier Research Activities have been carried out between Atomic Energy Authority and the University of Palermo, Department of Chemical Engineering. Her principal research contributions are in the areas of Active and Interactive Polymers, Radiation Synthesis and Modification of Polymers, Responsive Hydrogels, Conducting Polymers, Nanogels, Bionanomaterials, Polymer Matrix Composites, Polymer blends and Solar cells. She participated at several Coordinated Research Projects (CRP) of the International Atomic Energy Agency (IAEA) in the field of Radiation Synthesis of Nanomaterials, Radiation Curing of Composites for Enhancing the Features and Utility in Health Care and Industry. She is member of the board of directors of



created to support and encourage women working in nuclear sciences and industries throughout the world. WIN Egypt is the premier Egyptian network of women and men who work in nuclear- and radiation-related fields around the country.

## Promoting Environmental Sustainability through Green Chemistry: Role of gender on Chemistry Teachers' perceived and actual knowledge in Lagos State

Toyin Eunice Owoyemi, Adesina Adeleke

Department of Science and Technology Education, University of Lagos, Nigeria

The prevailing environmental problems and climatic changes faced in the world today result majorly from human activities that emanate out of ignorance of the devastating consequences of our day to day unfriendly environmental practices such as bush burning, deforestation, industrial development, consumption and inappropriate disposal of hazardous chemical substances, use of toxic chemicals in industrial production processes, air pollution from vehicle exhaust and so on. Chemistry as a discipline has also contributed in making our environment unsustainable through industrial applications and production of toxic and hazard inherent products that have had negative influence on man and the environment. Hence, needs for an urgent intervention that will remediate and reduce the impact of some of these menacing practices as their effects are threatening to human existence. Using a sample of male and female Chemistry

teachers, this study explores influence of gender on teachers' perceived and actual knowledge of Green Chemistry.

### Toyin Eunice Owoyemi



Dr. Toyin Eunice Owoyemi is a Senior Lecturer in the Department of Science and Technology Education, Faculty of

Education, University of Lagos. She holds Bsc. Ed Chemistry (OAU), a Post Graduate Diploma in Industrial Chemistry (FUTA), Masters of Technology in Analytical Chemistry (FUTA), Masters and PhD in Science Education (UI). She also undertook training on Policy Analysis Using Research Results and Field Knowledge for Education Quality Improvement in 2014 at Hiroshima University, Japan. She has over 40 publications in both International Journals and Local Journals. She has attended over 15 International Conferences where she presented papers and numerous National Conferences as well. Dr. T.E Owoyemi is an expert in the area of Curriculum Studies in Chemistry Education, Science Education and Sustainable Science Education with special focus on Sustainable (Green) Chemistry Education. She is a Fellow of Science Teachers Association of Nigeria (STAN) and a member of the following Professional Organizations: American Chemical Society (ACS), National Science Teachers Association (NSTA), Curriculum Organization of Nigeria (CON) and Teachers Registration Council of Nigeria (TRCN).

### Adesina Adeleke Sunday



Mr. Adesina Adeleke Sunday is an Assistant Lecturer in the Department of Science and Technology Education, Faculty of Education, University of Lagos. He holds Bsc. Ed Chemistry. Education (University of Lagos), Masters in Chemistry Education (University of Lagos). He is currently running his PhD program in Chemistry Education at the University of Ibadan. He has 2 papers in view of publication in international Journals. He has attended national conferences where he presented the papers. Mr A.S Adesina is a researcher in the area of Sustainable Science Education with special focus on Sustainable (Green) Chemistry Education. He is a member of Teachers Registration Council of Nigeria (TRCN).

### Chemistry teachers' perception of incorporating Green Chemistry into Chemistry Curriculum: Implications for Environmental Sustainability

Umanah, F. I.

Department of Science Education, Akwa Ibom State University Nigeria

The paper sought to investigate secondary school chemistry teachers' perception on incorporation of green chemistry into the chemistry curriculum and its implications for environmental sustainability. Two objectives and two research questions guided the study. Descriptive survey research design was adopted for the

study. The population consisted of all secondary school chemistry teachers in the 14 public secondary schools in Uyo Local Government Area. A sample of 44 chemistry teachers (24 females and 20 males) was drawn for the study from 10 randomly selected schools using simple random sampling technique. One researcher developed instrument tagged: Chemistry Teachers' Perception Questionnaire on Green Chemistry (CTPQGC) was used in gathering data for the study. The data collected were analyzed using mean, standard deviation and t-test statistics. The findings indicated that most of the chemistry teachers had no knowledge and awareness of the concept of green chemistry. The results also showed that male and female chemistry teachers exhibited equal perception on incorporation of green chemistry into chemistry curriculum. It was recommended among others that green chemistry should be incorporated into the chemistry curriculum and workshops/ seminars should be organized for chemistry teachers on the concept of green chemistry.

### Felicia Imeh Umanah



Dr. Felicia Imeh Umanah is a Lecturer II in the Department of Science Education, Faculty of Education, Akwa Ibom State University, Mkpata Enin, Nigeria. She holds B.Sc (Hons.) Chemistry (University of Calabar), a Post Graduate Diploma in Education (PGDE), M.Sc. (Ed.) in Chemistry and Ph.D in Chemistry Education (University of Uyo).

She has 20 publications in both Local and International Journals. She has attended two International Conferences and many National Conferences where she presented papers. Dr. Felicia I. Umanah is an expert in Chemistry Education, Science Education and Sustainable Science Education with special focus on Sustainable (Green) Chemistry Education. She is a member of the following Professional Organizations: Teachers Registration Council of Nigeria (TRCN), Science Teachers Association of Nigeria (STAN), Chemical Society of Nigeria (CSN), American Chemical Society (ACS), American Association of Chemistry Teachers (AACT), National Science Teachers Association (NSTA) and Curriculum Organization of Nigeria (CON).

## Research & Development as a Center for Excellence for Sustainable Development R & D in Nigeria Tertiary Institutions as A Case Study

Kalagbor, Ihesinachi A.

Research & Development Center, Ken Saro-Wiwa Polytechnic, Nigeria

The Research and Development Centre was established to advance the mission and vision of the polytechnic as it relates to research. In science and technology, research and development uses the results from scientific research and directs them to desired products for commercial yield. On technical level, high - tech organizations explore ways to utilize advanced technologies to scale up their commercial gains. The R & D center in the tertiary institutions involves itself in

innovative and cutting- edge research activities by encouraging staff and students to carry out projects that will position the institutions as Centers of Excellence in various specific research fields. These researches include: Waste to wealth in which organic wastes are collected within and around the institution and converted to biogas; production of ethanol from waste fruits and carbohydrates, fish farming and poultry farming, utilization of edible food waste and waste vegetables to generate electricity. Innovative technology is the driving force in any nation's economic growth. We can harness the natural raw materials around us to improve human life and the environment by minimizing the generation of hazardous and toxic substances. Finally, by encouraging and maximizing the application of Green Technology.

### Ihesinachi Kalagbor



She obtained a Ph.D degree in Analytical Chemistry from University of Port-Harcourt, Rivers State Nigeria in 2006. Dr. Ihesinachi A. Kalagbor is a

Chief lecturer and Director, Research and Development Centre, Ken Saro-Wiwa Polytechnic Bori. She has carried out a lot of research on heavy metals in water, soil, fruits, vegetables and crops. To date, she has supervised 67 students to graduation in Chemistry in the Polytechnic. She is involved with a team of researchers in her institution working on a pilot scheme for the generation of electricity using waste organic materials. She has published 26 papers in reputed journals. She is a Fellow

of the Chemical Society of Nigeria (FCSN), Fellow, Institute of Chartered Chemistry of Nigeria (FICCON), Fellow, African Scientific Institute (FASI), Member, Royal Society of Chemistry (MRSC), Member, International Water Association (MIWA) and an Affiliate Member of IUPAC. She is currently the coordinator, Women in Chemistry (WIC) Rivers Chapter, Nigeria.

## Water Desalination by Membrane Distillation with Waste Heat Recovery

Prof. Renato Machado Cotta

Interdisciplinary Nucleus for Social Development - NIDES, CT/UFRJ

Technology Center, Federal University of Rio de Janeiro, Brazil

Directorate General for Nuclear and Technological Development, DGDNTM, Brazilian Navy

The goals of sustainable development advocated by the United Nations have stimulated in recent years, in the context of thermal engineering, scientific and technological research on the reuse of rejected heat with high and low exergies, either from energy generation or the process industry in general, in secondary processes aligned with these objectives. On the other hand, advances in nano in micro-technologies have allowed substantial efficiency gains in heat and mass transfer processes, which under certain economic conditions and environmental conservation stimuli, can lead to significant innovations. The Aqua Vitae project is dedicated to the modeling, analysis and development of direct contact membrane distillation processes

(DCMD), aiming at the sustainable desalination of water from rejected heat recovery of different sources. In addition to proposing an improved model for the transport phenomena in DCMD, the research aims to modify commercial membranes to introduce characteristics to the surfaces in contact with the hot and cold water currents, for enhancing heat and mass transfer. The modified membranes are then tested in an experimental apparatus dedicated to the evaluation of the efficiency of the new process. Commercial membrane modules have been simulated and assembled for testing and demonstration in the Membrane Desalination Unit at UFRJ, with heat recovery from a solar collector, towards validation of the mathematical model. Also, thermodynamic analyzes were carried out to evaluate the technical feasibility of employing optimized DCMD from different thermal sources, such as small modular nuclear reactors (SMRs), stationary internal combustion engines, and high concentration photovoltaic panels (HCPV's).

### Renato Machado Cotta



Prof. Renato has B.Sc., Mechanical / Nuclear Engineering, Federal University of Rio de Janeiro (UFRJ), Brazil, 1981, Ph.D., Mechanical & Aerospace Engineering, North Carolina State University (NCSU), USA, 1985. He became associate professor, Mechanical Eng. Dept., Federal University of Rio de Janeiro, in 1987, Full Professor in 1994. Author of more than 500 technical papers, 10 books, supervisor of 82 PhD/MSc

thesis. Honorary Editorial Board of various journals, including International Journal of Heat and Mass Transfer, International Journal of Thermal Sciences, International Journal of Numerical Methods in Heat & Fluid Flow, and Computational Thermal Sciences. Regional Editor, "High Temperatures – High Pressures" journal, and Associate Editor, Annals of the Brazilian Academy of Sciences. President, Brazilian Association of Mechanical Sciences, ABCM, 2000-2001, Member of Scientific Council, International Centre for Heat and Mass Transfer, since 1993, Executive Committee of ICHMT since 2006, EC Chairman in 2017-2018, Congress Committee member, International Union of Theoretical and Applied Mechanics (IUTAM), 2012-2018, Executive Committee, Brazilian Academy of Sciences, 2012-2015. Recipient of ICHMT Hartnett-Irvine Award in 2009 and 2015, National Order of Scientific Merit, 2009 (Comendador) and 2018 (Grã-Cruz), and National Order of the Naval Merit, Brazil, 2018. Full member, Brazilian Academy of Sciences (ABC), 2009, National Engineering Academy (ANE), Brazil, 2011, and The World Academy of Sciences (TWAS), Trieste, Italy, 2012. President, National Commission of Nuclear Energy, CNEN, Brazil, 2015-2017. Visiting Professorship (Leverhulme Trust Fund).

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### **Multi-spectral MEMS based dual-axis microendoscope**

W. Piyawattanametha

King Mongkut's Institute of Technology  
Ladkrabang, Bangkok, Thailand

MEMS based microendoscopes have become important imaging tools for early cancer diagnosis and precise tumor resection. Due to various technical challenges, few microendoscopes have been translated to clinics or applied to human patients. Through synergistic collaborations, we have developed novel MEMS scanner enabled microendoscopic multispectral (640nm to 780nm) three-dimensional dual-axis confocal fluorescent imaging system for translational applications, including early cancer detection and staging on colorectal cancer, molecular imaging guided surgical navigation on head and neck cancer. Based on dual-axis confocal microscopic architecture, we have miniaturized the imaging system with compact form-factor by integrating micro-optics and a patterned gold coated MEMS scanners, which have been custom-made and mass-produced in the nanofabrication foundry. The metal coating of the scanning mirror provides over 80% high reflectivity over near infra-red range. Both axes of the MEMS scanner could perform large tilting angle (> 6 degrees mechanical scan angle) at DC and resonant mode. By advanced computational imaging approach, we have achieved real-time cross-sectional imaging in either raster or lissajous pattern scanning with fast frame rate (> 10 Hz) with large field-of-view (> 600 microns). Advanced real-time mosaicing algorithm has been developed to achieve broader view in millimeter scale. By utilizing molecular contrast probes conjugated with fluorescence dye, we have successfully demonstrated multi-spectral *ex-vivo* and *in-vivo* imaging on small animal tumor models and human tissue specimens, aimed for both early

cancer detection and molecular imaging guided surgical navigation.

### Wibool Piyawattanametha



Dr. Piyawattanametha received Ph.D. degree in Electrical Engineering from the University of California, Los Angeles, USA in 2004. Currently, he is with the King Mongkut's Institute of Technology Ladkrabang, Ladkrabang, Thailand as the Director of Advanced Imaging Research (AIR) Center. In 2013, he was selected by the World Economic Forum (WEF), Switzerland to be one of the 40 top young scientists under the age of 40. In 2014, he was one of the two recipients in the world to receive the prestigious Fraunhofer-Bessel Research Award from the Alexander von Humboldt Foundation, Germany for his pioneering work in light microendoscopy techniques. In 2015, he was awarded the Newton Fund Researcher Links from the British Council, United Kingdom for his novel optical imaging technique for early cancer detection. In 2017, he was selected to be a fellow in Leaders in Innovation Fellowships (LIF) from The Royal Academy of Engineering, United Kingdom.

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### Micro-technologies and Hybrid Engineering Approaches for Sustainable Electricity, Biofuel, and Water Production Applications

Carolina Palma Naveira

University of Rio De Janeiro, Brazil

The need for sustainable development has been driving research efforts worldwide and, in particular, within the scope of thermal sciences and engineering, towards more energy efficient equipment and processes. On the other hand, nanotechnology and micro-fabrication techniques have enabled the improvement and development of diverse engineering applications, while providing new challenging scientific perspectives in fundamental research. A hybrid engineering approach to the study of transport phenomena at the micro-scale, based on the synergy among computational, analytical, and experimental methodologies, is here presented. The focus of the lecture is on fundamental analysis and proof of concept developments in the use of micro-technologies for energy efficiency and heat and mass transfer enhancement applications. The hybrid approach described herein combines improved lumped-differential modeling, hybrid numerical-analytical solution methods, mixed symbolic-numerical computations, and advanced experimental techniques for micro-scale transport phenomena. Applications are selected to demonstrate the proposed methodologies in the application of micro-technologies in the energy efficiency improvement for renewables through waste heat recovery, in the less energy intensive and more portable production of biofuels, and in the low energy cost and maintenance facilitated water desalination, among other advanced technologies. The examples include the concept and

demonstration of the cooling of HCPV (high concentration photovoltaic) panels with micro-heat exchangers, the use of waste heat in the continuous biodiesel synthesis in micro-reactors from regional vegetable oils and waste cooking oil in the ethanol route, and in water desalination through micro-porous membranes distillation.

### Carolina Palma Naveira



Dr. Carolina holds the BSc (2004), MSc (2006) and DSc (2009) degrees in Mechanical Engineering from the Federal University of Rio de Janeiro, Brazil. She is Associate Professor at the Mechanical Engineering (since 2011) and Nanotechnology Engineering Programs (since 2013), both at COPPE/UFRJ in Brazil. Dr. Naveira-Cotta was elected as affiliate member of the Brazilian Academy of Sciences in 2014, and as an elected member of the Scientific Committee of the International Center for Heat and Mass Transfer since 2016, and elected member of the Deliberative Council of the Brazilian Society of Mechanical Sciences and Engineering since 2017. She has published more than 140 papers, including 41 articles in international journals, 7 book chapters and more than 90 articles in national and international congresses. Heading the Nano and Microfluidics and Microsystems Laboratory, she has supervised more than 60 undergraduate scientific initiation and final graduation projects, 15 MSc theses and 8 DSc theses. She is research Consultant/Coordinator of

Research Projects and Scholarship Programs with important companies, agencies and funding institutions.

### Rendering Farm for Multimedia Applications

Sokyna Al-Qatawneh

Al-Zaytoonah University of Jordan, Jordan

In multimedia applications, rendering can be defined as the process to generate or re-create a new multimedia product (video, 2D/3D animation, audio, and 2D/3D object, etc.) by converting the project components (such as, pixels, objects, frames, geometry, viewpoint, texture, lighting, and shading etc.) into an image, audio or a scene file. Product visualizations created with rendering software help the product development process in myriad ways. It helps to sell ideas or concepts long before they exist in physical form; and it helps to identify design problems; and can shorten the time to market. However, for complex objects or high quality images, the rendering process requires massive computational resources; this is for complex scenes that arise in scientific visualization, medical visualization, Computer-aided design applications, and virtual reality. For example, the rendering of some applications may need millions or billions of floating-point and integer operations for each image. Some image generating techniques work very slowly in simple machines. To obtain the required computing power, the only practical solution is to exploit multiple processing

units to speed up the rendering process. Parallel rendering can greatly improve the performance of computer graphics applications. In parallel rendering, a task is divided into many sub-tasks and processed by more than one processor simultaneously, resulting in a significant reduction in the response time. A cluster of machines are usually used to fulfill such kinds of tasks. With parallelization, high-quality multimedia product of great complexity can be easily produced, and high image processing efficiency can be achieved. Jordan like other developing countries, have started to progress in the production of multimedia applications, in spite of the great interest in the field of audio/visual media and the game designing, rendering process is fully rely on traditional methods that depends on each machine performance( CPU speed). The faster is computer's CPU the faster is rendering will complete, and in most cases it takes a long time which is consider as a big limitation. This project aims to construct a powerful parallel computing system using a multicore programming model that implements the render process for different multimedia tools in order to improve the performance of computer graphics applications. The render farm will overcome the problems of cost, speed and time consuming for different multimedia applications in academic and industrial domains. The constructed farm will be available to use online for all researchers, academics, businesses and students after finishing the project.

### Sokyna Al-Qatawneh



Dr Sokyna Al-Qatawneh is a computer scientist and a multimedia systems expert at the Faculty of Science and IT; Al-Zaytoonah University of Jordan. Dr. Alqatawneh has obtained her PhD in Computer Vision from Bradford University (UK) in 2010. Dr. Alqatawneh's principle research interests are in the areas of 3D Digital Image Processing, Pattern recognition, Machine Learning, and 3D Modelling. She is a peer reviewer for several related journals and conferences in her field of research. Dr. Al-Qatawneh is a full member of (OWSD), a professional member of the New York Academy of Sciences (NYAS), a mentor at 1000 Girls, 1000 Futures program for girls and women in STEM, a mentor at the United Technologies Aerospace Challenge, and a member of the Women Democracy Network (WDN). In addition, Sokyna is the coordinator of youth initiative "Kelmt Khair" in Jordan. She plays an effective role in increasing the positive attitudes and self-efficiency for female university students, by encourage them to be involved and effective in the community and try to find ways to overcome the challenges women face such as: discrimination, lifestyle choices & family obligations.

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## Long-Span Stock Market Co-movements between the US and other Advanced Economies

Sonali Das

Council for Scientific and Industrial Research, South Africa

We consider the co-movements (or correlations) of the stock markets of the US with the other six G7 countries. We use historical data, which in some cases spans from the 1800's. Our objective is to ascertain the effect of global crises on these co-movements in a Functional Regression framework, by regressing co-movement (monthly frequency) with the Global Crises Index (annual frequency). A major advantage of the Functional Data Analysis (FDA) framework is that it allows us to perform this mixed frequency regression, as aggregating co-movements data would make us lose information. The regression coefficient functions are analyzed and considerable knowledge on the effects of crises on comovement of data is gained.

Sonali Das



Das completed her MSC (Statistics) from the University of Calcutta, India, and a PhD (Statistics) from the University of Connecticut, USA. Since 2006 she has lived and worked in South Africa. Das' research interests include Bayesian methods, applied statistics, statistical modelling, structural equations modelling and path analysis, longitudinal data analysis, risk analysis, extreme value theory, non-parametric methods,

clustering, functional data analysis, decision theory and consulting. Her track record includes a number of large interdisciplinary local and international collaborative projects. Das regularly publishes in peer-reviewed journals and her latest H-score stands at 11. She also holds a Visiting Associate Professorship at the University of the Witwatersrand and a Research Associateship at the Nelson Mandela Metropolitan University. She is currently the Chair of the South African Statistical Association (Gauteng-Chapter), member of the South African Statistical Association Executive Committee, as well as the CSIR node-leader of the NRF Centre of Excellence for Mathematical and Statistical Sciences. Currently she holds a C-rating from the NRF. Das was also the Chair of the 2018 WISWB conference held in Johannesburg, South Africa.

## Healthcare system based on internet of things

Omaima Goher

Higher Institute of computer Science and Information Technology, 6<sup>th</sup> October University, Egypt

Due to the growth of the technologies of the smart devices, mobile applications and the embedded systems the Internet of things is increasingly allowing to integrate devices capable of connecting to the Internet and provide information on the state of health of patients and provide information in real time to doctors who assist. It is clear that chronic diseases such as diabetes, heart and pressure among

others are remarkable in the world economic and social level problems. The aim of this project is to develop an architecture based on digitized information capable of monitoring the health and workout routine recommendations to patients with chronic diseases by using the wearable device and internet of things to create meaningful data.

### Omaima Goher



Omaima Goher graduated from the Faculty of Engineering (Electrical Communication and Electronics) at Alexandria University in 1991. She obtained a Diploma in Computer science and Information Systems in 1998 from the Institute of Statistical Studies & Research at Cairo University. She received her Master's degree in Computer Science in 2003 from Atlantic International University's School of Science and Engineering. Afterward, she received her Ph.D. in Computer Science in October 2006 from Atlantic International University. She also holds a Ph.D. in the field of Electronics and Communications (Telemedicine-medical teleconferencing systems), which she received from the Polytechnic University of Bucharest in December 2009.

### Removal of organic pollutants using polysulfone ultrafiltration membrane containing polystyrene silicomolybdate nanoparticles: Case study: Borg El Arab area

Yousra H. Kotp

Water Treatment & Desalination Unit, Desert Research Center, Cairo, Egypt

Polysulfone (PSf) nanocomposite ultrafiltration (UF) membrane was prepared using polystyrene silicomolybdate (SiMo/PS) nanoparticles (NPs). The spherical SiMo/PS particles can be simply doped into a PSf membrane via the phase inversion process, which allows the hydrophilic SiMo/PS spheres to migrate to the hydrophobic PSf surface and facilitates the antifouling capability of the membrane, especially its antibacterial activity. Consequently, the nanocomposite hybrid membrane (SiMo/PS/PSf) displays excellent overall completion in separation performance compared with pure (PSf) and polystyrene/PSf (PS/PSf) membranes, where nanosized SiMo particles (70 nm) can completely and uniformly diffuse through the flat surface of the PS spheres. However, for bovine serum albumin (BSA) solution, the outcomes show that the modified membranes have a 99% rejection (compared to 90% for the basic membrane). Also, contact angle measurements expose that adding the NPs increases the hydrophilicity of the PSf surface. This membrane could be an exceptional material for water treatment purposes.

### Yousra Hafiz Kotp



Dr. Kotp is a researcher in water chemistry at Desert Research center and got her B.Sc and M.Sc in chemistry from chemistry department-faculty of science- Al Azhar University. She Has got her Ph. D in chemistry from Ain Shams University. Her activities at Desert Research center were focused on the development of advanced reverse osmosis and ultrafiltration membranes by the synthesis of nanomaterials membrane composites, preparation of different nanoparticles by different methods and using it in water treatment. She is principle investigator for project funded by Academy of scientific research and technology, to establish: Egypt desalination alliance. She has experience in (Chemical analysis of water constituents), the preparation and environmental applications of nanotechnology, evaluation of water quality, synthesis, preparation, characterization & application of ionic membranes, and other reactive polymers that used in the field of water desalination & treatment. She has experience in the field of using different nanoparticles for water treatment and field work especially at desert areas in addition to experience in training staff on water quality methods. She has good experience in diiferent fields of research and in working with many different scientific instruments. She is a reviewer in different international journals. She published fourteen papers in different international journals in the field of desalination and water treatment.

### Recent trends in Photovoltaic research

Shaimaa A. Mohamed

Center for Nanotechnology, Zewail City for Science and Technology. Egypt

Recent trends in optoelectronic research are all based on solution process technology. The ease of material processing from solution make the fabrication easy and minimize the cost and enable the scalability for large area and flexible production. However, device build using these materials are often suffered from low efficient charge extraction and/or injection and always limited by non-radiative recombination. Here, we highlighted two classes of these materials, namely organic and quantum dots with a focus on the photovoltaic and we show a pathway to process the materials into film and integration for device fabrication. We shell also highlight the light trapping possibility as a part of our research activity.

### Shaimaa Ali Mohamed



Shaimaa Ali Mohamed is an assistant professor at Zewail City of Science and technology and she is the National Representative of the African Network of Solar Energy. Shimaam obtained her BSc in Physics and Chemistry at Ain Shams University. Then she moved to Liquid Crystal Laboratory at Cairo University where she obtained her master degree. She is then joined the Arab Academy of Science, Technology and Maritime

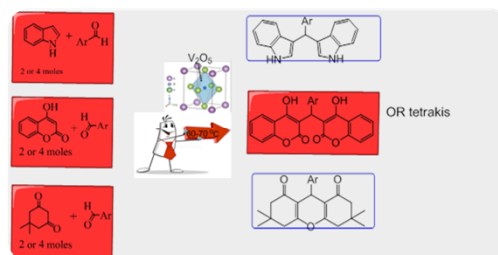
Transport as Physics Teaching Assistant (2009-2014). In 2012, Shaimaa was hired as a research assistant at Zewail City of Science and Technology. She is then started her Ph.D. at Banha University and was awarded two ANSOLE/ICTP scholarships in the frame of the Africa-North Exchange Program (ANEX) for six and three months, respectively. With this fund, Shaimaa joined Linz Institute for Organic Solar Cell (LIOS), Austria at Prof. Serdar Sarcftci's group. During her Ph.D. she had the opportunity to visit many African countries and to present her work at different international conferences. Her Ph. D. work is published in high impact factor journals and by the end of 2015, she obtained her Ph.D. degree in Solid state physics from Banha University joint with (LIOS). She is then appointed as a full-time postdoctoral researcher at Zewail City and she had two research visits to LIOS as postdoctoral during 2016 and 2018 three months each. Shaimaa awarded many prizes including the best Contribution Prize, Cape Town, South Africa 2013, best poster and oral prize/summer school for young scientists on Renewable Energies in Africa- Arusha, Tanzania 2015 and Young Research Award, Thessaloniki, Greece 2015. And she is selected as the best ANSOLE fellow for the year of 2016. She is also the organizer of the 1st international conference in renewable energy (INCORE2016) in celebration of the 5<sup>th</sup> ANSOLE anniversary. Her main research interest is an organic & optoelectronic

## Nano-perovskite supported V2O5 as a new catalyst for the synthesis of heterocyclic compounds

Hanan A Soliman

Chemical Industries Research Division,  
National Research Centre, Egypt

In this article, new heterogeneous catalyst from easily available materials is prepared in nanoparticles, this reagent is V2O5/perovskite nanoparticles, the structure of the prepared catalyst is proved by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) and scanning electron microscope supported with energy dispersive X-ray (SEM/EDAX). On application in organic synthesis, we found that this catalyst is efficient in the synthesis of Bis and tetrakis of coumarin, indole and xanthene derivatives, this heterocyclic compounds are obtained in high yield and very short time.



## Hanan Soliman



Dr. Hanan Soliman obtained her B.Sc. Degree in Chemistry, May 1991, and her MSc. degree in December 1994 from Faculty of Science, Mansoura University, Egypt. She has completed her PhD in 2001 from Department of chemistry Faculty of Science, Mansoura University, Egypt. She is associate. professor at the National Research Centre, Egypt. She has served as Assistant professor for 10 years (2002-2012) at Saudi Universities. Research Interests include organic chemistry, organic synthesis and catalysis. She is member in association of young researchers and Egyptian Chemical Society.

## Tailored Ionic Liquids as Future of Green Chemistry

Shimaa Mohamed Elsaeed

Egyptian Petroleum Research Institute, Cairo, Egypt

Ionic liquid is defined as a salt with melting point below the boiling point of water. Ionic liquids are known by several different names like neoteric solvents, designer solvents, ionic fluids, and molten salts. Most of the ionic liquids are composed of organic cation and inorganic anions. In order to be liquid at room temperature, the cation should preferably be unsymmetrical; that is, the alkyl groups should be different. Polarity and hydrophilicity/hydrophobicity of ionic liquids can be tuned by suitable

combination of cation and anion. It is this property of ionic liquids which has earned them the accolade “designer solvents.” This work approaches both in the field of ionic liquids and polymers combined with ionic liquids to the exceptional and diverse properties and applications of such advanced materials. Also we will deal the influence of the cation/anion combination of the ionic liquids on the physical properties of the ionic liquids and application

## Shimaa Mohamed Elsaeed



Dr. Shimaa is professor at polymer chemistry & material science. She acted as visiting professor at Lehigh University, Pennsylvania, USA. She is Reviewer for science and technology development fund (STDF). Dr. Shimaa is member of national committee for women in science (NCWS) at ASRT, member of royal society of chemistry (RSC), American chemical society (ACS), IUPAC, organization for women in science for the developing world (OWSD), society of petroleum engineers (SPE), member in many other organizations as (FAO, UN, CCN, E-agriculture, RWSN). She is board member in Tanks Services Center (TSC). She participated in the establishment of laboratory in (TSC) and Egyptian petroleum research institute (EPRI). Dr. Shimaa is editorial board member & Reviewer in International Journals & Organizing Committee for several international conferences. She is judge & Volunteer in Intel-ISEF and first Lego competitions. She is principal investigator

(PI & Co-PI) for several projects and certified reviewer.

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## Three-Dimensional Reconstruction of Medical Images Using Computer-Generated Holograms

Rania Mohamed Abdel Azeem

National Institute of Laser Enhanced Sciences (NILES), Cairo University, Egypt

Recently, holography has become the most popular method for reconstructing high quality three-dimensional medical images floating in the air without special eyewear. Digital holography has some of important and modern applications including holographic microscopy, sectioning, phase extraction, optical contouring and deformation measurement. The Computer-Generated Holographic images must be produced at very high resolution. The practical implementation of three-dimensional holographic display faces the challenge of addressing large amount of data that must be recorded and processed in the reconstruction. Fast calculation and correct depth cue are important issues in calculation of Computer-Generated Holograms for high-quality three-dimensional display. Spatial light modulators are used recently to present Computer-Generated Holograms dynamically. Also, the ability of digital holography to measure the phase and the deformation of the object will be utilized

as a useful tool for physicians in diagnosis and therapy.

## Rania Mohamed Abdel Azeem



Rania Mohamed Abdel Azeem got her Bachelor degree from Helwan University, Biomedical Engineering Department, 2004. She joined National Institute of Laser Enhanced Sciences (NILES), Cairo University, Department of Engineering Applications of Laser, 2009. Rania obtained her master degree in 2016. Area of research in master was in improving microscopic images by using adaptive optics for aberration correction. Now, she is a PhD. Candidate at NILES, the field of research is the uses and applications of Computer-Generated Holography in reconstructing high resolution three-dimensional medical images which will be a helpful tool for physicians in diagnosis and therapy.

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## Internet of Things IoT

Fatma Newagy

Faculty of Engineering, Ain Shams University, Cairo, Egypt

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. It is the network of physical objects or "things" embedded

with electronics, software, sensors and network connectivity which enable these objects to collect and exchange data. Smart cities and autonomous vehicles are some applications of IoT. Let's demonstrate how IoT is transforming industries like automotive, energy, healthcare, transportation and manufacturing as well as various appliances like door well cam, air tracking, electricity plug, security system, oven, thermostat, and tens of others. History of IoT, Benefits of IoT and Consumer and enterprise IoT applications will be presented. Due to popularization of IoT, new challenges are emerging with respect to privacy problems. So, IoT security and privacy issues will be illustrated. Internet of Things opportunities and challenges will be considered. All future aspects of Internet of Things will be discussed like Accessing more data, IoT enabled inventory management process, Employees working remotely, Efficiency and productivity, New consumers required, New staffing members required and Continuous customer engagement.

### Fatma Newagy



Fatma Newagy graduated in 1998 from Faculty of Engineering, Cairo University where she worked as research assistant and obtained a master's degree in 2002 and PhD degree in 2008 of Electronics and Communications Engineering. She worked Assistant Professor at Cairo University (2008 – 2011). Then, she moved to Ain Shams University as Assistant Professor (2011 – 2016) and Associate Professor

(2017 – To date). Dr Newagy is a member of Space Research and Remote Sensing Scientific Council, Specialized Scientific Councils - Academy of Scientific Research and Technology (SSC-ASRT) since June 2018. Dr. Newagy got in her carrier history about 20 years in total academic and research experiences in many universities which are Ain shams University (ASU), Cairo University (CU), American University in Cairo (AUC), German University in Cairo (GUC), Arab Academy for Science and Technology & Maritime Transport (AASTMT) and Masr International University (MIU). She is supervisor of more than ten Master degree students and six PhD degree students and external examiner in various universities in Egypt. She shared in different research projects and grants as “Enhancement Proposals for DVB-T2 Systems and Cognitive Radio Networks Sharing the Same Frequency Band” was founded by NTRA. Her research interests are Information Theory and coding, Satellite Communications, Internet of Things, Mobile and Wireless Communications and Cognitive Radio Networks. Fatma Newagy has more than 40 international research papers, all in international journals with high impact factor and international conferences worldwide. She is also an associated editor and reviewer in several high impact factor international journals.

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## Hyperbranched Polyamidoamine hydrogel for grey water treatment and reuse in agriculture

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Egyptian Petroleum Research Institute (EPRI),  
Cairo, Egypt

A series of micro-hydrogel particles consisting of hyperbranched polyamidoamine without any supporting core materials was synthesized via the inverse suspension condensation polymerization of monomers, N,N'-methylenebisacrylamide (MBA) and ethylenediamine (EDA). The particles were found to be highly effective when used to remove heavy metal ions, such as cadmium, copper, lead, nickel, zinc, and cobalt, from grey water, and they could be separated from the water by a simple filtration process. The results of this study demonstrate that crosslinked polymer particles, which can be prepared by a simple and environmentally friendly process, are an attractive absorbent for water purification.

### Elsayed Zaki



Dr. Elsayed Zaki is a researcher in petroleum applications department, Egyptian petroleum research institute. Dr. Sayed took part in many research papers, books and applied projects in the field of corrosion and scale problems particularly in petroleum industry and project in green chemistry for synthesis of hydrogels in agriculture.

Dr. Elsayed is capable and self-reliant scientific worker with broad knowledge in scope of corrosion protection methods as well as scale problems, surfactants and polymers. Dr. Elsayed is member for several scientific communities as royal society of chemistry (MRSC), chemicals development services center (CDSC), Egyptian corrosion society (ECS), the Arab society of material science, petroleum and mineral resources society, Egyptian petroleum association, the Egyptian society of polymer science and technology (ESPST) and IUPAC. He is also a member in Asia-Pacific chemical, biological & environmental engineering society (APCBEEES), society of petroleum engineers (SPE), world academy of science, engineering and technology (WASET), the international association of engineers (IAENG), Egyptian association for science and engineering (EASE), Sesame Users' committee (SUC), Synchrotron- Light for experimental science and applications in the Middle East, international association of advanced materials (IAAM), the society of digital information and wireless communications (SDIWC), the international society for environmental information sciences (ISEIS) and the organization for women in science for the developing world (OWSD). He has certified training from United Nations about climate change.



## Nanocomposites dendritic polyamidoamine based chitosan hyperbranched polymer for waveguide applications

Eman H. Ahmed, Magdy M.H Ayoub, Ahmed I.Hashem, Inas K. Battisha, Amal Amin

Polymers and Pigments department, National Research Center (NRC), Giza, Egypt

Silica phosphate/chitosan based hyperbranched dendritic polymer nanocomposite SiPhDER3+ was prepared for photonic applications such as planar optical wave guide sensors (POWS). Dendritic polymer (D) polymer was prepared by surface modification of chitosan (CT) via Michael addition reaction and treatment with tris-2-aminoethylamine to give (D).SiPhD nanocomposite was doped with well dispersed erbium Er<sup>3+</sup> ions as rare earth metal into form SiPhDER3+ nanocomposite. The properties of sol gel SiPhD and SiPhDER3+ materials in both forms of monolith and thin film were carefully characterized by Fourier transform infrared (FT-IR), X-ray diffraction (XRD), both of high-resolution scanning and transmission electron microscopy (HRSEM and HRTEM), respectively. The refractive indices have been investigated for all the prepared nanocomposites by using transmittance and reflectance spectra.

### Eman H. Ahmed



Eman Helmy Ahmed was joined National Research Centre (NRC) – Egypt, since 2008 at the lab of advanced materials and nanotechnology group, at

the Centre of Excellence. Now, she works as a researcher assistant at polymers and pigments department. She has a strong background in the field of solid-state physics and polymer research to produce hybrid organic/inorganic nanostructured materials.

## Transition metal complexes of $\alpha$ -aminophosphonates Part I: synthesis, spectroscopic characterization, and in vitro anticancer activity of copper(II) complexes of $\alpha$ -aminophosphonates

Hanaa Abdel Latif El-Boraey, Ahmed Abdel Aleem El-Gokha, Ibrahim El Tantawy El-Sayed, Mariam Ahmed Azzam

Applied Organic Chemistry Department, National Research Centre, Cairo, Egypt

A new generation of copper(II) complexes with  $\alpha$ -aminophosphonate as tridentate ligands has been synthesized. It is characterized by elemental analyses, spectral (IR, UV-Vis, MS, EPR, and <sup>1</sup>H NMR) studies, thermal analysis as well as magnetic and molar conductance measurements. On the basis of spectral studies, a distorted square-planar geometry has been assigned for all the complexes. Specific rotation measurements for both ligands and copper(II) complexes showed that they are enantiomerically enriched. The metal-free ligands and their Cu(II) complexes were tested for their in vitro anticancer activity against human colon carcinoma HT-29 cell lines. The results showed that

the synthesized copper(II) complexes exhibited significantly higher anticancer activity than their free ligands. Among all the tested compounds in the series, the complex 5g demonstrated the highest anticancer activity at low micromolar inhibitory concentrations (IC<sub>50</sub>= 14.2 IM) which is about a half of the reference drug activity, cisplatin (IC<sub>50</sub>= 7.0 IM) in the same assay.

### Mariam Ahmed Azzam



Mariam Azzam is a Research Assistant at Applied Organic Chemistry Department, National Research Centre, Egypt. She completed her MSc in Organic Chemistry, Menoufia University, Egypt. Her research experience is in incorporating metal ions into newly synthesized organic compounds (ligands) to afford metal complexes with the aim of improving the biological activity. She is currently working on organic synthesis, specifically in designing and developing synthetic routes for small organic molecules and heterocyclic compounds.

### Hydroxyl terminated hyperbranched polyester grafted nano rice husk powder / EPDM nanocomposite for biomedical applications

Heba Kandil, Hanem Awad, Doaa El-Nashar, Mohamed Nader Ismail, Amal Amin  
National Research Center, Egypt

Novel nanocomposite (HBPE-g-nRHP/EPDM) was prepared from aliphatic

hyperbranched polyester grafted nano rice husk powder (HBPE-g-nRHP) with ethylene propylene diene monomer (EPDM) by using solvent casting technique. Different loadings (0.5, 1.25 and 2.5 phr) were taken from modified and unmodified nRHP to investigate the effect of HBPE-g-nRHP on the mechanical and thermal properties of the resulting nanocomposites. Distribution of modified and unmodified nRHP in nanocomposites was checked using scanning electron microscopy. The cytotoxicity of the prepared nanocomposites (HBPE-g-nRHP /EPDM & nRHP/EPDM) were investigated towards HepG-2, MCF-7 and RPE-1 human cell lines in vitro using MTT assay.

### Heba Kandil



Heba is a researcher at polymers and pigments department at National Research Center in Egypt. Her work focuses on the development of promising nanocomposites from synthetic and natural polymers with using different types of nanofillers especially biofillers such as rice husks powder in order to involve them in future industrial applications.

### Bioplastic from the microorganisms as a promising biopolymer

Lamis. M. Diab  
Medical Research Institute, Damanhur, Egypt

The plastic products usage has significant increased recently because it is easier, and cheaper as compared to other materials. They are non-biodegradable requiring centuries to decay and they neither degrade or decompose. Their washing away to water reservoirs, clogging waterways, floating on reservoirs, and polluting them. Additionally, plastics fabrication uses dangerous chemicals, which are added as stabilizers or colorants. Bio-plastics, made from renewable sources instead of oil, reduce the dependency on limited fossil resources. PHA (polyhydroxyalkanoate) is polyester produced by bacteria act as bio-plastic and an alternative to petroleum-based plastics. The main member of the PHA family is Polyhydroxybutyrate (PHB), that is macromolecule synthesized by bacteria and inclusion bodies accumulated as reserve materials within bacteria when they grow under different stress conditions. Under natural conditions, they degrade naturally and completely to CO<sub>2</sub> and H<sub>2</sub>O by different microorganisms. Twenty isolates isolated from soil and organic wastes where twenty-five from each. Screening of PHB in cells by sudan black and Nile red screening methods and extracted by sodium hypochlorite-chloroform method. Under nutrient-limiting conditions with excess carbon, number of microorganisms from the clay soil strains produce PHAs as reserve food material. The PHB granules production must be tested by using various concentrations of C, N, C:N ratios, pH effect, incubation times, different fermentation media, and different temperature. Bio-plastic avoid harmful effects of the plastic and degraded easily.

### Lamis M. Diab



Lamis M. Diab obtained her Bachelor degree in chemistry/biochemistry with very good degree from the University of Damanhur, Egypt, May 2011. During her postgraduate studies at Medical Research Institute as a Master student, she conducted, as a research group leader, a great deal of research concentrating on the Liver diseases. The research was then published in national newspaper in Egypt. She worked as teaching assistant at biochemistry department, faculty of Science, Damanhur University. She managed in many sections which are overseen the strategic planning process for her department. She assisted department managers in identifying future needs for students and materials that aligned with the strategic objectives set by her professors. She has experience in teaching, medical research, medical analysis and scientific writing. She is interested in medical research, biochemistry and molecular biology fields of research.

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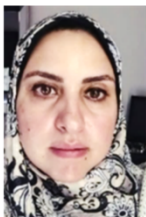
### Social Innovation and Digital Technology: Why Human-Computer Interaction Education Matters?

Shaimaa Lazem

City of Scientific Research and Technological Applications, Alexandria, Egypt

Information and Communication Technology (ICT) is considered one of the promising pillars for emerging economies' growth. There is an increasing global and local interest in developing inclusive digital technologies that meet social needs, and pave the road to sustainable social impact. In Egypt, there is a need for a workforce that is willing to engage with the bottom-the-pyramid users as a potential market for digital technologies. Computer Science students are ought to harness interdisciplinary skills that enable them to sympathize with users with diverse backgrounds and digital literacy abilities. Human-Computer Interaction (HCI) discipline puts the user at the heart of the design process. It is thus argued that teaching HCI could build a capacity necessary to fulfil this workforce gap. HCI education is underrated by Engineering students due to the way by which its courses are integrated in the Egyptian curriculum along with other inherited pedagogical challenges. The talk will demonstrate the results of four activities to train approximately 100 engineering undergraduates on conducting social innovation projects following HCI methodologies. Shaimaa will additionally give an overview about her work in HCI education and her involvement in the Arab and African HCI movements.

### Shaimaa Lazem



Shaimaa Lazem is an academic researcher at the City of Scientific Research and Technology Applications (SRTA-City). At SRTA-City she established a research program in human-computer

interaction (HCI). Her research interests include participatory design, cross-cultural collaborations, post-colonial computing, and decolonizing HCI. Her previous projects included designing low-cost education and health technologies and applying learner-centered and flexible learning pedagogies for teaching computer science and HCI. Lazem has experience working with rural communities. She is the Egyptian lead of a UK-Egypt project to engage Egyptian Bedouins in self-documenting their intangible heritage using mobile phones. One of the project outcomes is a mobile application that allow the non-Bedouins to ask questions about the Bedouin culture, which authenticated Bedouins who could then choose to answer either using text, audio, or video. She was recently awarded the Leaders in Innovation Fellowship with the Royal Academy of Engineering in London to design an archival platform for marginalized communities to self-document their indigenous knowledge. Lazem is the Chair of the Cairo ACM SIGCHI Professional Chapter in Egypt CairoCHI

### Optical Diagnosis of Biological Tissues

Omnia H. A. Nematallah

National Institute of Laser Enhanced Sciences, Cairo University, Egypt

Medical diagnosis with optical techniques is safer and causes less pain for patients other than the traditional diagnosing

methods. Every tissue type can be distinguished by its optical absorption and scattering properties which are related to many physiological changes and considered to be very important indicators for tissue health. Therefore, Studying light propagation in human organs and tissues is a vital issue in many diagnostic and therapeutic applications. In this work, light propagation in human brain and breast tissues at different conditions was investigated. A Monte-Carlo simulation model was implemented to obtain spatially resolved steady state diffuse reflectance profiles of the examined tissues. Furthermore, the diffusion equation was solved to create images presenting the optical fluence rate distribution at the tissue surface using the finite element method. The proposed diffuse reflectance curves and fluence rate images show different features regarding tissue type and condition that promises to be effective in medical diagnosis.

### Omnia H. A. Nematallah



Omnia Hamdy received the B.S. with an honor's degree at the department of systems & biomedical engineering, faculty of engineering, Cairo University, Egypt, in 2005. Omnia joined the National institute of laser enhanced science (NILES) at the department of Engineering Application of laser (EAL), Cairo University in 2006 as an academic assistant. She received the diploma, M.Sc. and Ph.D. degrees from the department of EAL in 2007, 2013 and 2018, respectively. Omnia's research in M.Sc. focused on uses of laser photocoagulation

in treatments of different retinal disorders. On her PhD, the main idea was to improve tissue monitoring and characterization with diffuse optics using different analytical techniques related to transport theory of light propagation in biological tissues. Many international journal articles were published from her results in optical medical diagnosis. In July 2018, Omnia won the grand poster prize from the Abdus Salam International Center for Theoretical Physics "ICTP" after participation in the hands-on research in complex systems summer school, ICTP, Trieste, Italy.

### Synthesis and Thermal conductivity of Iron vanadium oxide-Iron oxide Hybrid Nanofluid in Flat Plate Prototype Solar Collector

Eman M. Mostafa, Sawsan A. Mahmoud, Saad M. Desouky, A. M. Soliman and M. S. A. Abdel-Mottaleb

Egyptian Petroleum Research Institute, Cairo, Egypt

This work interested in the application of the nanofluids in prototype flat plate solar collectors. For this purpose, iron vanadate oxide nanoparticle was prepared in one step by simple sol-gel method at different pH 3, 9 and 11. The prepared samples were investigated at 100 OC or 500 OC. The samples were characterized by X-ray diffraction (XRD), Nitrogen adsorption-desorption isotherm, Fourier Transform Infrared Spectroscopy (FTIR), Raman Spectroscopy, High Resolution Transmission Electron Microscopy

(HRTEM), Thermo gravimetric analysis (TGA) and dynamic light scattering (DLS). The results showed the formation of mixed phases; Iron –vanadium oxide and hematite. The nanofluids were prepared using prolonged sonication. The prepared fluid was characterized by Rheological measurements and dynamic light scattering (DLS). Different factors affecting the stabilization of the nanofluid as the weight of nanomaterial, sonication time, and pH were also studied. To evaluate the thermal conductivity of the prepared nanofluid, two prototypes of flat plate collectors were constructed to be used in the natural solar energy. The synthesized nanofluid showed high thermal conductivity behavior in flat plate collector in different weathering conditions. The prepared nanofluid showed high stability more than 3 months. The results showed that nanofluid increase the efficiency of flat plate collector.

### Eman M. Mostafa



Eman is a researcher at the Egyptian Petroleum Research Institute (EPRI). Her research focuses on (Superheated Steam Generation using Solar System Prototype for recovery of Heavy Oil from Egyptian Reservoirs), Which be a part of the renewable energy researches in (Egyptian Petroleum Research Institute). She has a good experience in inorganic, analytical and photo chemistry and its` applications in the identification of structure and function of nano selective coating and Nanofluid heat transfer material which used in solar thermal

energy. She attended a Renewable Energy Diploma of (Sciences and Engineering of Renewable Energy) in Beni-Suef University, Faculty of Post graduated for Advanced Science, Egypt. She got diploma for statistical control and quality assurance at Cairo University , Egypt and Diploma of Biochemistry and Analytical chemistry in Alexandria University, Egypt. Her main target is using the principles and characteristics of chemistry and Engineering to be applied in economics and management of renewable energy.

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### Photoelectrochemical Oxidation of Water by Nanoporous Anodized Stainless Steel 316L Photoanode

Heba H. Farrag, Sayed Y. Nagy, Nageh K. Allam, Ahmad M. Mohammad

Chemistry Department, Faculty of Science, Cairo University, Energy Materials Laboratory, School of Sciences and Engineering, The American University in Cairo, Egypt

The urgency to secure alternative resources for fossil fuels along with the advanced revolution in nanoscience have stimulated a significant motivation in the sector of energy to develop nanostructured materials for several electrochemical and photoelectrochemical applications. Of these applications, the hydrogen production and storage received exceptional attention in renewable energy plants. Actually, most of renewable plants perform efficiently under certain circumstances (e.g., the daytime for solar cells). Therefore, a storage/restoring system is required to save excess

electricity from the time of plenty to the time of delay. So far, the applications of water splitting experience a lack of materials ensuring enhanced efficiency and reasonable stability. We herein propose a procedure to develop metal oxide nanostructured-based material for solar energy conversion. We herein suggest a propitious photoanode prepared by the anodization strategy for water splitting. This novel photoanode is composed of nanoporous arrays of stainless steel 316L. The morphology, composition, and crystal structure of as-prepared photoanode were investigated utilizing the field-emission scanning electron microscope, the energy dispersive X-ray spectrometer and the X-ray photon electron spectroscopy. The current-potential measurements were carried out in a three-electrode electrochemical cell and a scanning potentiostat was employed to measure the dark and illuminated currents.

### Heba H. Farrag



Heba H. Farrag received her BSc in 2013 from the Faculty of Science at Cairo University (Chemistry major). She exhibited a strong academic record during her study (2009-2013) in CU which recommended her to join the academic faculty staff of the department of Chemistry of CU as a teaching and research assistant in 2015. By that time, she joined the research group of Prof. Ahmad M. Mohammad as a M.Sc. graduate student. Also, she joined EML group of Dr. Nageh K. Allam as a research assistant in the American University in

Cairo. She was awarded her MSc (Physical Chemistry) from Cairo University in 2018. Her main research deals with fabrication of nanomaterials for energy conversion applications. Currently, she seeks for PhD scholarship position.

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## Wastewater Treatment: How to Turn Problems into Opportunities

Mohamed Mahmoud

Water Pollution Research Department,  
National Research Centre, Egypt

Nowadays, the concept of wastes is obsolete. Our current challenge is to recover value-added products, including renewable energy production, from waste streams (e.g., wastewater). In this context, a recent approach – known as “microbial electrochemical cells (MXCs)” – is recently developed to enhance the treatment of waste streams. Their main functions can be broken into two main categories: (1) recovery of renewable energy in different useful forms and (2) production of clean treated water that can be discharged safely into water bodies, by removing the biodegradable organic contaminants. Since the organic compound is the “fuel” for the MECs are complex in nature, their biodegradation requires cooperation among different trophic groups: fermenters, homoacetogens, and anode-respiring bacteria (ARB), as well as competition with methanogens. When a mixed-culture MEC is fed with a fermentable substrate, such as glucose, a significant fraction of

the substrate's electrons ends up as methane (CH<sub>4</sub>) through hydrogenotrophic methanogenesis, an outcome that is undesired. Here, we show that free ammonia-nitrogen (FAN, which is NH<sub>3</sub>) altered the glucose fermentation pathways in batch MECs, minimizing the production of H<sub>2</sub>, the "fuel" for hydrogenotrophic methanogens. Consequently, the Coulombic efficiency (CE) increased: 57% for 0.02 g of FAN/L of fed-MEC, compared to 76% for 0.18 g of FAN/L of fed-MECs and 62% for 0.37 g of FAN/L of fed-MECs. Increasing the FAN concentration was associated with the accumulation of higher organic acids (e.g., lactate and propionate), which was accompanied by increasing relative abundances of phylotypes that are most closely related to anode respiration (Geobacteraceae), lactic-acid production (Lactobacillales), and syntrophic acetate oxidation (Clostridiaceae). Thus, the microbial community established syntrophic relationships among glucose fermenters, acetogens, and ARB. The archaeal population of the MEC fed 0.02 g FAN/L was dominated by Methanobacterium, but 0.18 and 0.37 g FAN/L led to Methanobrevibacter becoming the most abundant species. Our results provide insight into a way to decrease CH<sub>4</sub> production and increase CE using FAN to control the fermentation step, instead of inhibiting methanogens using expensive or toxic chemical inhibitors, such as 2-bromoethanesulfonic acid.

### Mohamed Mahmoud



Mohamed Mahmoud is a researcher at National Research Centre, Egypt. He earned a PhD degree in Environmental Engineering from Arizona State University (USA) in 2016. He is a long-term researcher working on water resources management, especially resources recovery (i.e., clean water, energy, and nutrients) from wastewater, and to address the sanitation issues in resource-poor, developing countries, ensuring safe water and sludge reuse. His key research objective is to incorporate fundamental findings into process models for system design, performance prediction, and technology enhancement. He has authored 16 peer-reviewed articles (h-index = 8) and reports as well as 12 presentations at international symposia. He is reviewer for 17 international academic journals, including Water Research, Bioresource Technology, Chemical Engineering Journal, ACS Sustainable Chemistry & Engineering, and Water Science and Technology, and serves as an editorial board member for 3 peer-reviewed international academic journals. He has been elected for the membership of the management committee of the Biofilms specialized group International water Association and the specialized scientific council for water and irrigation sciences Academy of Scientific Research and Technology (ASRT), Ministry of Higher Education (Egypt). Recently, Dr. Mahmoud has been named as an Africa Science Leadership Programme (ASLP) fellow (the University of Pretoria, South Africa - 2019).



## Designing and Implementing a Low-Cost Electrospinning Device

Ibtisam A. Saeed, Manaf A. Mohamed, Suhad A. Yasin

College of Science, University of Duhok, Iraq

Electrospinning is a commonly used technique for the fabrication of fibers at nanoscale level. This technique uses an electrical field for the formation of the Nanofibers (A nanofiber is a fiber with a diameter of less than one micrometer), which can be made of polymeric, metallic, ceramic or composite solutions. There are many attempted to produce the nanofibers systematic by different desigees, vertical or horizontal systems. The aim of this work is to design and implement an Electrospinning device with low cost to open the door to the nanotechnology in University of Duhok. The device has been designed and implemented in the University of Duhok/ College of Science/ Department of Physics as a request of the need of a PhD student in Chemistry Department, where the university could not afford to buy such expensive device. The design includes two parts mechanical part and electronic part as a controller. Stepper motor is used to rotate the spiral shaft, whose rotation will cause the attached half nut to move and push the syringe. Stepper motor is chosen because it is accurate in its movement and the speed can be controlled to any required value. The electronics box has eight switches for liquid pumping Speed selection. With these switches we can get

32 different flow rate selection. Four different syringe sizes were used, the flow rate ranges (from 3.9  $\mu\text{l/hr}$  to 4000  $\mu\text{l/hr}$ ). The device has been used and gave good results, the produced Nanofibers diameters were in the range of 200 nanometers.

### Ibtisam A. Saeed



Ibtisam Saeed is a lecturer in Physics department/ College of Science/ University of Duhok /Iraq. She had a PhD in Physics/ Electronics from university of California in 1982. She got her MSc in Physics from University of California at 1979. In the beginning, she worked as teaching assistant at university of Baghdad. With the PhD degree, she worked as Scientific researcher, and then senior scientific researcher in the Iraqi Atomic Energy Organization, (1982 – 1991), in the field of automated system design. She shared in designing and implementing many control and data acquisition (DAQ) systems, hardware and software. After 1991, she was transferred to the Military Industrial corporation/ General Company for Mechanical and Electronic designs as a Senior scientific researcher, and head of senior researchers, where she participated in projects of reconstruction of electrical power plants and worked in the field of reverse engineering. After 2003, she transferred to the Electronic systems centre/ Ministry of manufacturing and minerals, as a head of senior researchers, then as expert. Many monitoring and DAQ systems had been designed and implemented by her group. In 2005, she

started as a university lecturer at University of Duhok/ College of Science/ Department of Physics. Now, she is a member of PEER project group, working in the field of nanotechnology. She started in this field by designing and implementing an electro-spinning device.

### Suhad Yasin



Suhad Yasin, is a Ph.D. student working at the University of Duhok /Iraq. She received her Master in Polymer Chemistry in 2009.

During her Master period, she focused her research on the Preparation of new materials to remove heavy metals from aqueous solutions. She has many published articles. From October 2016 until now, her research activities mainly focused on the preparation of nanofibers for application of water treatment from hazardous materials. She is also a principal investigator at Partnerships for Enhanced Engagement in Research (PEER) project under Cycle 6/ IRAQ. The PEER project title is (Removal of Heavy Metals Using Nanofibers Membrane). The aim of her project is to open a Nanotechnology laboratory in her university and to support women-scientist researchers.

## New Amphiphilic Interfaces in Cellulosic Composite to Improve Different Properties

Soha M. Albukhari and Patricia A. Heiden

Department of Chemistry, King Abdulaziz University, Jeddah, Saudi Arabia

Use of cellulosic reinforcements is likely to rise as we seek a renewable economy. Cellulosics are hydrophilic and biodegradable, and for many uses these properties must be reduced. We hypothesized that grafting the cellulose with an amphiphilic modifier, that is a short hydrophobic segment on the cellulose surface topped by a second block to adhere to the matrix, we could accomplish these goals. Rice husk (RH) could be a valuable reinforcement in countries without forests, and even useful here if wood becomes a major biorefinery feedstock. Therefore, we tested our hypothesis by grafting a diblock oligomer Methylmethacrylate(17,33)-b-Acrylonitrile106 and homo-oligomer controls to RH, and found the 33 wt% of RH-g-PMMA17-b-PAN106 in Urea-Formaldehyde composites reduced water uptake by 30%, raised the modulus by 22% increase in modulus, and increased resistance to brown and white rot fungal decay. In this talk we will seek to explain these results and suggest ways to further increase the value of this approach.

### Soha M. Albukhari



Dr. Soha works at the department of chemistry, faculty of science, Kind Abdulaziz University, KSA. Soha Albukhari was graduated

from the Department of Chemistry, King Abdulaziz University in 2002 and received her MS in 2007. She joined the polymer and nanotechnology research group at Michigan Technological University, USA and received her Ph.D. degree in 2017. Afterward, she returned to King Abdulaziz

University as Assistant professor in department of chemistry. Her research interests include biomass materials and nanotechnology. These biomass materials are fabricated as nanoparticles, nano-fibers and composites where their properties including physical, mechanical, nano-mechanical and biological properties are the matter of current research.

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## Track 3: Agriculture – Veterinary - Food

## Track 3: Agriculture

### Transgenic grain legumes in Egypt: current status and future prospects

Moemen S. Hanafy

Plant Biotechnology Department, National Research Centre, Cairo, Egypt

Soybean (*Glycine max* (L.) Merrill) and faba bean (*Vicia faba* L.) are important grain legumes worldwide. These crops are difficult objects for breeding due to their narrow genetic base and their partly outcrossing character. Improvement of soybean and faba bean on the other hand, is hampered by their recalcitrance both to regeneration and transformation. Commercially grown soybeans and faba bean are affected not only by pests and diseases, or abiotic stresses, but also show an imbalance in nutritional quality of the seed protein. In this review, we present our activity towards improvement of these grain legumes using biotechnology and our future plans.

#### Moemen S. Hanafy



Prof. Dr. Moemen S. Hanafy (1970) is a professor of plant Biotechnology at plant Biotechnology Department, National Research Centre (NRC), Egypt. As a DAAD alumni, he obtained his doctorate in Molecular Genetics from Plant Biotechnology Department, Hannover

University, Germany in 2002 before moving to Sapporo, Japan, where he worked at National Agricultural Research Center for Hokkaido region on manipulation of the seeds amino acids using genetic engineering approach as a JSPS fellow (2003 – 2005). In 2005 he joined Centre of Excellence for Advanced Science, National Research Centre (NRC) as a researcher of Plant Biotechnology and he shared Prof. M. Sakr (president of ASRT) in establishing Plant Molecular Genetics research group (2005 – 2008). Finally, he moved to Hannover, Germany, where he worked at Plant Biotechnology Department, Leibniz Universität Hannover on enhancement of abiotic stress tolerance of faba bean by heterologous expression of the PR10a gene from potato as Alexander von Humboldt (AvH) fellow (2008 – 2010). From January 2012 till June 2013 he worked as associate professor of plant biotechnology at faculty of science and humanities, Salman bin Abdul-Aziz University, KSA. Dr. Hanafy has over 24 years Experience in multidisciplinary laboratory and plant biotechnology research. Over the past 15 years, he developed plant Biotech research leading to about 26 research articles published in peer-reviewed international journals, five book chapters and about 20 invited presentations at national and international levels. He is a member of some professional societies and currently serves on three editorial boards. In the last 8 years, Dr. Hanafy was granted two prizes; Prize of the president of the National Research Centre for best applied research, 2008 and National Research Centre Prize for scientific encouragement in biology, 2013. Dr. Hanafy got his professorship in plant biotechnology on

March 2015. Recently, he is appointed to be an Ambassador Scientist of the Alexander von Humboldt Foundation in Egypt from January 2016 to December 2021. On 2018, Prof. Hanafy has been elected to be the chairman of the Egyptian National Committee of Biological Sciences.

## Plant Pathology

**Nawsheen Taleb-Hossenkhan**

Department of Biosciences and Ocean Studies, Faculty of Science

University of Mauritius, Mauritius

In Mauritius, substantial decrease in potato yields due to late blight is reported annually and it has become necessary to track the genetic identity of local *Phytophthora infestans* strains. The Random Amplified Polymorphic DNA (RAPD) technique is a low-cost and simple genetic characterization tool that has been widely used for molecular fingerprinting but which requires extensive optimization. The aim of this study was to carry out a series of experiments to optimize a RAPD protocol for routine *P. infestans* typing. Amplifications performed with DNA template concentration of 30-50 ng/μl, primer concentration of 2.0 - 3.0 μM and MgCl<sub>2</sub> concentration of 3.0 mM gave the best RAPD profiles. These optimised conditions were used to carry out RAPD fingerprinting of 7 *P. infestans* isolates and codified data was used to construct a consensus dendrogram, which grouped the 7 isolates into 3 distinct clusters,

consistent with results obtained from other molecular characterization techniques.

## Nawsheen Taleb-Hossenkhan



Dr. Nawsheen was graduated with a BSc Hons in Biotechnology from the Imperial College of Science and Medicine, University of London in 2000 with a Second Class First Division award and started her PhD in the same year at the University of Mauritius in collaboration with the Scottish Crop Research Institute (now the James Hutton Institute) in Dundee, Scotland, during which she studied the molecular mechanisms of late blight disease resistance in *Solanum tuberosum* (potato). After successfully publishing two papers in the journals of *Molecular Plant-Microbe Interactions* and *Canadian Journal of Plant Pathology*, she was awarded PhD in 2004, and joined the University of Mauritius as Lecturer in 2006. Since then, she has been actively involved in teaching Molecular Biology, Bioinformatics, Genetics, Molecular Plant Pathology and a few other related subject areas. She has also been active in research, graduating three PhD students, with three others under her current supervision, published one full book, 18 articles in Peer-reviewed International Journals and Conference Proceedings, 24 Research Abstracts, and secured a total of Rs 3.45 million in interdisciplinary research grants both from within University and external sources. She collaborates with various researchers in the fields of parasitology, microbiology and marine science, bringing the

molecular aspect to projects which are both health-related and environment-based.

## Oxidative defense and growth of broccoli (*Brassica oleracea* L.) plants in response to nitric oxide under water limited conditions

Nudrat Aisha Akram

Department of Botany, Government College University, Faisalabad, Pakistan

Nitric oxide (NO) is a diffusible gaseous molecule and has been under wide consideration because of its ability to mitigate the adverse effects of many abiotic stresses in plants thereby enhancing plant growth and yield. In the current study, it was determined whether or not exogenously applied and which mode, pre-sowing or foliar spray of sodium nitroprusside (SNP) as a donor of nitric oxide (NO) could alleviate the drastic effects of drought stress on broccoli plants. Seeds were soaked with 0.02 mM NO solution and distilled water for pre-sowing and control treatments respectively. Two levels of drought (Control and 60% FC) were applied to 4 weeks old broccoli plants. Foliar treatment of NO (0.02 mM) was applied to broccoli plants after 3 weeks of drought stress. After 12 days of foliar application, samples were collected to determine photosynthetic as well as antioxidant activities and other biochemical parameters. The results showed that water deficit conditions decreased the biomass, shoot fresh weight and shoot

length, glycine betaine, chlorophyll contents while it enhanced ascorbic acid (AsA), hydrogen peroxide and SOD enzyme activity. However, exogenously applied NO enhanced the fresh biomass, shoot dry weight, shoot length, chlorophyll contents, GB, total phenolics, total soluble proteins and activities of SOD and POD in broccoli plants under water deficiency. It was also observed that foliar application of NO was more effective in enhancing the drought tolerance in broccoli plants as compared to pre-sowing application of NO. Therefore, foliar as well as pre-sowing application of NO could be helpful in enhancing the oxidative defense system of broccoli plants under water deficit condition.

### Nudrat Aisha Akram



Dr. Nudrat Aisha Akram, is currently working as Assistant Professor of Botany at the GC University, Faisalabad, Pakistan. She earned PhD in Botany (2011) from the University of Agriculture, Faisalabad, Pakistan. She is a recipient of cash award of Rs. 5000/- on completion of her PhD by the university as well as a Gold medal from the Pakistan Academy of Sciences (PAS), Islamabad, Pakistan in the field of Botany for the year 2012. She has been selected as member, Pakistan Academy of Sciences (PAS), Islamabad, Pakistan in 2016 and TWAS Young Affiliate in 2015. Dr. Akram started her career in 2006 as a "Research Assistant" in the Department of Botany, University of Agriculture, Faisalabad in a HEC funded project. Onward she has worked in a variety of research projects

funded by different national and international agencies including HEC, Pakistan Academy of Sciences, and King Saud University, Saudi Arabia. She has carried out extensive research work to examine the effects of different stresses on potentially important cereal crops (wheat, rice, maize), vegetables, oil-seed crops and grasses. Improvement in crop tolerance to various stresses has been one of her major focuses of research. She has produced 14 MPhil and 21 MSc students. Her research output is very impressive. Dr. Akram has more than 106 publications including 16 review articles and 4 chapters in an edited book.

## Importance of Thyme Herb in Nutrition and Human Health

Eqbal Dauqan

Department of Public Health, Sport and Nutrition, Faculty of Health and Sport Science, Norway

*Thymus vulgaris* L. (*T. vulgaris*) a significant aromatic plant with around 100 species in the world is widely used for medicinal purposes as well as in culinary dishes. The genus *Thymus* are important medicinal plants, highly recommended due to a variety of therapeutic properties of their essential oils, normally known as Thyme oil. *Thymus* species are considered as medicinal plants due to their pharmacological and biological properties. Its properties are due to its main components, thymol and carvacrol. Fresh Thyme has the highest level of antioxidants among all herbs. *Thymus*

*vulgaris* L. is widely used in folk medicine in the treatments of variety of diseases such as gastroenteric and bronchopulmonary disorders. The essential oil of thyme and the compound thymol have antimicrobial activity in vitro against *E. coli* strains. The essential oil of thyme has been found to possess the strongest antimicrobial properties. Thus, the highlight of this paper was to review the Importance of thyme herb in nutrition and human health

### Eqbal Dauqan



In 2012, Eqbal M.A. Dauqan received her Ph.D in Biochemistry from the School of Bioscience and Biotechnology, Faculty of Science and Technology, Universiti Kebangsaan Malaysia (UKM), Malaysia, sponsored by the Organization for Women in Science for the Developing World (OWSD). Her main research interest is biochemistry, food antioxidants, and nutrition. Her thesis was awarded for being an excellent thesis. She was appointed as a Post-doctoral Fellow at the School of Chemical Sciences and Food Technology, FST, UKM from July 2012 to July 2013. In July 2013 she was appointed as Senior lecturer at Department of Medical Laboratory Sciences-Faculty of Medical Sciences, Al-Saeed University (SU) - Taiz, Yemen, where she became Head of the Medical Laboratory Sciences Department at the same Faculty. In 2014 Eqbal established a new program entitled Therapeutic Nutrition Department in, SU. She was selected as one of five winners of the



developing countries (Chemical Sciences). Dr. Eqbal was selected to be a visiting scholar in UKM, Malaysia sponsored by IIE\_SRF (USA) from Feb 2016 to Feb 2018. In February 2018, she affiliated with the Global Young Academy as a mentee in the At-Risk Scholar initiative. In September 2018, she had been selected as TWAS Young Affiliate for 2018-2022. Currently, Dr. Eqbal was appointed as an associate professor at University of Agder (UIA), Kristiansand-Norway through the Scholar at Risk (SAR) Network, USA.

carried out at  $180^{\circ}\text{C}\pm 5^{\circ}\text{C}$  for 24h, 4h heating cycle per/day for six consecutive days. The fried sunflower oil was treated with synthetic and natural adsorbent materials at  $105^{\circ}\text{C}$  for 15 min. The results indicate that Magnesol XL and olive waste ash contained Si+ Mg+ Mn and Si+ Mg+ Ca as the basic metals, respectively. Frying of sunflower oil led to significant increase in physico-chemical properties. Treatments of fried sunflower oil with the aforementioned substances greatly improved the quality of fried oil. The results of this study were shown that natural adsorbent (olive-waste ash) can improve its adsorption capacity significantly. In this respect, utilization of olive waste-ash for frying oil recovery applications can be an industrially is a very cheap and easily found material.

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## Effectiveness of olive-waste ash as an adsorbent material for the regeneration of fried sunflower oil

Amany, M. M. Basuny

Biochemistry Department, Faculty of Agriculture, Beni-Suef University, Egypt

The present work explored the use of olive-waste ash, a byproduct of the manufacture process of olive oil in mills as a natural adsorbent for improving the quality of fried sunflower oil compared with synthetic adsorbent material (Magnesol XL) were used to absorb the oxidation products of fried sunflower oil. The metal content (Si, Mg, Ca, Fe, Al, Mn, and Cu) of the adsorbent materials were determined. The physico-chemical properties (color, viscosity free fatty acids, peroxide value, induction period, polar content and polymer content) of fresh, fried and fried-treated sunflower oil were determined. The frying process was

### Amany, M. M. Basuny



Dr. Amany is professor, head of biochemistry department, faculty of agriculture & supervisor of Nutrition Dept., National Institute of Gerontology, Beni-Suef University. Dr. Amany has many papers in biochemistry, nutrition, antioxidants, Bioactive components, olive oil, and oils & fats published in international journal. She supervised many MSc. and Ph.D. theses and Participated in many scientific projects and many national and international conferences. She is reviewer and editorial board member for some international journals.

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## Impact of magnetically treated irrigation water on growth and yield of eggplant in various textured soils

Dr. Shaimaa Hassan Abd-Elrahman

Faculty of Agriculture, Ain Shams University, Egypt

Impact of magnetic field on plants still a controversial issue, wherefore this experiment was conducted to assess the effect of magnetized saline water on the growth and yield of eggplant as well as the soil properties. Eggplant was cultivated during two seasons in columns (60 cm length and 20 cm internal diameter) packed with clayey and sandy soils with four irrigation water treatments including: tap water (0.4 dS m<sup>-1</sup>) and saline water (7.5 dS m<sup>-1</sup>) in both ordinary and magnetically treated. The results indicated that the irrigation with magnetically treated water significantly increased the growth, yield and element contents of eggplant i.e. N, P, and K, as well as, resulted in a remarkable reduction of pH, soluble sodium and chloride ions of soil while increasing the availability of N, P and K in the soil. Moreover, the irrigation with magnetically treated water also enhanced the fertilizer use efficiency as compared to untreated water. The magnetically treated water increased the downward movement of soluble salts as can be deduced in EC values of the drained water. Such increases were higher with applying the magnetized saline water in irrigation more than using magnetized tap water, and in sandy soil more than clayey soil. Our results suggest that magnetically treated

irrigation water can enhance plant tolerance to stresses and recommended to use as a suitable practice for improving the growth and yield of plants especially under salt stress conditions in arid and semiarid regions.

### Shaimaa Hassan Abd-Elrahman



Dr. Shaimaa is associate professor at soil science department, faculty of agriculture, Ain Shams University. She is technical assessor at Egyptian Accreditation Council (EGAC) and peer reviewer for several International Journals. She is member at international associations as Franklin international membership.

### Updating the national adaptation strategy in Egypt

Fadl Abd Elhamid Hashem

Climate Change Information Center and Renewable Energy (CCICRE) - Agriculture Research Center (ARC), Egypt

Egypt's greenhouse gas emissions account for about 0.58% of total world emissions in 2015, although Egypt is one of the countries most affected by climate change impacts. By assessing and analyzing the projected economic impacts of climate change by 2030, the Egyptian cultivated area will be reduced to about 0.949 million feddans, equivalent to about 8.22% of the cultivated Egyptian area. The delta will lose at least 30 per cent of its

food production by 2030 as a result of climate change impacts, including low crop and livestock productivity, increased demand for agricultural crops, reduced water use efficiency, increased pest and disease infection, institutional weaknesses, as well as the negative impacts of salinity, etc. This will complicate the situation of the already economically affected and food-insecure region. The national adaptation strategy in Egypt aims to: 1) improve adaptive capacity of the northern region in the face of projected climate decline in food production; and 2) build institutional capacity at all levels to enable sustainability and replication throughout the region and country. These two objectives are the cornerstone of Egypt's national adaptation strategy. The updated Strategy is the agriculture section of Egypt's National Adaptation Strategy, which is still being drafted. It focuses on the projected climate risks for the productivity of ten major crops, livestock production and fisheries. The strategy outlines the need to develop new areas, explore and disseminate crops and efficient water and heat production methods. The methodology of this proposal is based on community mobilization, climate adaptation planning, introduction and use of water-saving irrigation and other adaptation techniques, capacity-building for adaptation in agricultural production, resilience building through livestock and poultry production, training of government technical personnel, documentation of lessons learned and best practices and sharing of results projects and lessons learned and to mainstream new approaches in local and

national planning. The expected results are summarized as follows: Improved adaptive capacity of the North Delta region in the country in the face of the expected decrease in climate resulting from food security through asset creation, transfer of knowledge / technology, capacity / skills development, and most committed local authorities' investment in - and sustainability - strategies and climate risk reduction measures.

### Fadl Hashem



Dr. FADL HASHEM has a Ph.D. in Horticulture science from Faculty of Agriculture, Ain Shams University, Egypt. He is national expert on UNFCCC roster of experts. He holds several leading positions such as member of the national committees for environmental issues and future earth at the Academy of Scientific Research and Technology, agro-meteorological application department, the information technology team and team member of (CLAC) to develop mathematical models for computerized irrigation and fertilization scheduling based on the Agro-meteorological data and the soilless culture (2004-till now). In 2004, he was member in the training programs of “the Safe Utilization of Farm Wastes” (SUOFW) project, implemented (CLAC) – (ARC) - Ministry of Agriculture and Land Reclamation. In 2007, he was member of the new project of (GIS) component in the national program for the eradication of peach fruit fly and acted as a researcher in (CLAC) team working in FP6 project of "adaptation of agriculture in European

regions at environmental risk under climate change". He was member of the project for geographic information systems (GIS) component in the plant and land survey in the Delta and Nile Valley. In 2010 he was member in the project "impacts of climate change of water management in Egypt (ICCWM)". In 2010, he gave some lectures with (CLAC) team on the short courses of irrigation and fertilization requirements. Dr Fadl participated in several international\regional conferences\meetings and training courses. He is the author of several publications and has several other activities.

### **Purification and identification of novel antioxidant peptides from buffalo and bovine casein hydrolysates.**

Ahmed Behdal Shazly

Researcher, Dairy Science Department, National Research Centre, Giza, Egypt

Buffalo and bovine caseins were hydrolysed by alcalase and trypsin enzymes to produce novel antioxidant peptides. The casein hydrolysates were purified using ultrafiltration (UF) and further characterized by RP-HPLC. The fractions produced higher antioxidant activities were identified for their peptides using LC MS/MS. All UF-VI (MW < 1 kDa) fractions showed higher antioxidant activity. Hydrolysate produced by alcalase for buffalo casein (UF-VI with 54.84-fold purification) showed higher

antioxidant activity than that obtained by trypsin. Trypsin hydrolysate contained high amount of hydrophobic amino acids while alcalase hydrolysate consisted mainly of Ser, Arg, Ala and Leu. The antioxidant peptides identified by LC MS/MS were RELEE, MEDNKQ and TVA, EQL in buffalo casein hydrolysates produced by trypsin and alcalase, respectively. Mechanism and reaction pathways of selected antioxidant peptides with ABTS were proposed. Conclusively, buffalo casein provided antioxidant peptides similar to bovine, suggesting that buffalo and bovine caseins are novel sources of antioxidant.

### **Ahmed Behdal Shazly Mohammed**



Ahmed Behdal Shazly Mohammed is Researcher at Dairy Science Department, National Research Center, Egypt.

His specific field is dairy and food science, and Nutrition and their relative with milk products and food safety. He had been gotten on two diplomas: Agricultural Science (Biotechnology) 2003, and (Quality control of Food and Milk product) 2004, Faculty of Agriculture – Ain Shams University. Also, the M.Sc. degree from Agricultural science "Dairy Science & Technology ", Faculty of Agriculture – Ain Shams University, 2009 and PhD degree (2017) in Food science and Technology, School of Food Science and Technology, Jiangnan University, China. He has participated in many international conferences and

symposiums; Multi-disciplinary Approaches for the Chemistry of Amino Acids & Peptides and their Medicinal Applications” Peptide Chemistry Department, NRC, Cairo, 2018. Oral presentation “Nutritional and Health Impacts of some Minor Milk Constituents” National Research Centre, Organized by “Egyptian Society of Dairy Science”, Cairo, 18 April. 2018. "New Methodologies Leading to significant Advanced in Functional Foods" at School of Food Science and Technology, Jiangnan University, China. The 3th International symposium on Minerals & Dairy products. As best poster presentation on MADP 2017” Sep 20-22, 2017, Wuxi, China. The 7<sup>rd</sup> International Conference on Food Industries and Nutrition Research Division "The Scientific Research and Industry in the Service of Food and Nutrition ", NRC, Cairo, Sept.2018. He had recently published two papers at Food Chemistry 2017-2019.

## The importance of fortified dairy products

Mervat Foda

Dairy Dept., Food Industry and Nutrition Division, National Research Centre, Cairo, Egypt

Milk and dairy products are consumed by a wide range of people for many reasons. Children consume milk during their developmental stage and adults consume milk, yogurt, cheese and ice cream for nutrition, pleasure and/or taste. While, women for medical reason to help

prevent osteoporosis and other bone- and joint-related diseases. Milk and dairy products offer proteins, micronutrients, fats, vitamins and other essential components. Although, milk and dairy products serve as excellent sources of essential nutrients, some people do not receive their daily dose of such nutrients due to several factors. Fortification of dairy products helps consumers have daily requirement of micronutrients, reducing the risk of certain diseases and nutrient deficiencies. Micronutrients used in the applications include folic acid and vitamins A, D, C and E. Vitamin D3 in milk and cheese. Vitamin A has been added to milk since the early 1940s; vitamin E is added to milk to curb the incidence of cardiovascular disease (CVD); and ascorbic acid in milk has shown to improve the net absorption of iron. Also, milk beverage can be fortified by omega-3 specially for autistic children (Egyptian patent).

### Mervat Foda



Mervat Foda is a Professor of Dairy Science and Technology, National Research Centre, Cairo, Egypt. She has two patents entitled “Formation of

Dairy Beverage for Autistic Children”, No: 634 / 2015 and “Production of herby soft cheese” No: 118 / 2008, the Academy of Scientific Research & Technology, Egyptian Patent Office, Cairo, Egypt. Prof. Foda has received some Distinguish Innovation Certificate from the Minister of Higher Education and Scientific Research, Egypt and the president of National Research Centre. She has got a bronze medal from the International Invention

Fair of The Middle East, Kuwait. the best research paper, Unilever Mosharak Co. She has published a book chapter in "Women and ICT in Africa and the Middle East: Changing Selves, Changing Societies" and more than 40 research papers in scientific peer reviewer national and international journals. She has got different international scholars' positions, starting in Food Engineering Dept., - Lund Univ., Sweden, the institute of Industrial Fermentation - Madrid, Spain, followed by the Department of Nutrition and Health Science, Siebold University of Nagasaki, Japan, and the Department of Industrial Microbiology and Biotechnology, Institute of Microbiology Chinese Academy of Sciences, Beijing, China. Prof. Foda is frequently invited to give keynote lecture in national and international conferences. Prof. Mervat is an Editor and Reviewer in different Science Alert journals and a member of Standing Committee of the upgrades at Bagdad University, Iraq, Sudan University for Science and Technology, Khartoum, Sudan and an external examiner for the Visvesvaraya Technological Univ., Karnataka, India. Prof. Mervat is a member in many international scientific societies such as Asian Council of Science Editors. (ACSE), Swedish South Asian Network on Fermented Foods, The Bioethics Network on Women's Issues in the Arab region, GRACE-project team leader, Lund Universitet-Alumni Group and DAAD-Alumni Group, Chinese-Egyptian Friendship Society, The Organization of Women in Science – Tunis, in addition to some Egyptian societies. Prof. Mervat is the president of the Society of Women in Science in Developing Countries–Egypt and the president of the Swedish – South

Asian Network for Fermented Foods – National Chapter – Egypt (SASNET-FF - Egypt). Member and project leader of gender research in Africa into information communication technologies for empowerment (GRACE) through the International Development Research Centre in Canada (IDRC).

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## **Mycobiota and Aflatoxin Contamination in fish feeds from East Africa**

Esther Marijani

Open University of Tanzania, Tanzania

A total of 52 samples of finished fish feeds and ingredients were collected from smallholder farmers in Kenya, Tanzania, Rwanda and Uganda, and analyzed. Culture and molecular techniques were used to identify fungal isolates from the feedstock, and mycotoxin profiles were determined using liquid chromatography-tandem mass spectrometry. The most prevalent fungal species recovered in the samples was *Aspergillus flavus* (54.5%). Other fungal species recovered from the samples were *Aspergillus tamarii* (9.1%), *Mucor velutinosus* (9%), *Phoma* sp. (6.1%), *Aspergillus niger* (6%), *Eurotium rubrum* (3%) and *Penicillium chrysogenum* (3%). Fourteen mycotoxins were identified: aflatoxins B1, B2, G1 and G2, fumonisin B1 and B3, deoxynivalenol (DON) and acetyldeoxynivalenol (sum of 3-ADON and 15-ADON), ochratoxin A, roquefortine C, alternariol, T-2 toxin, and nivalenol. DON (92.9%), aflatoxins (64.3%) and fumonisins (57.1%) were the most prevalent within locally manufactured

feeds, while no contamination was found in imported feed. Samples from Kenya were the most contaminated with aflatoxin (maximum 806.9  $\mu\text{g}\cdot\text{kg}^{-1}$ ). The high levels of aflatoxin and trichothecene type A and B contamination found in this study point to potential risks to fish performance and to the health of consumers of the fish and derived products.

### Esther Marijani



Dr. Esther is Assistant Lecturer. She got her B.Sc. in 2002 for Food science and technology at Sokoine University of Agriculture, M.Sc. 2005: Food safety at Wageningen University and PhD in 2019 in Food science at Open University of Tanzania. Principles of economics & consumer education, meal planning and institutional catering and nutritional diseases and disorders, nutritional diseases and applied dietetics and food safety, Research and publication. Microbiological and toxicological safety of food products, food safety, mycotoxin analysis in maize, feeds and animal products. She works with farmers to improve quality and safety of fish and fish products, palm oil, cashew nuts, coffee and tea.

### Are we the best friends of dogs?

Anindita Bhadra

Behaviour and Ecology Lab, Dept of Biological Sciences, Indian Institute of Science Education and Research Kolkata, India

The dog is man's best friend, and yet, scientific knowledge of the dog's behaviour, ecology and cognitive abilities in a natural environment is quite scarce. Dogs don't exist outside human homes in the West, and so, most research on dogs have focused on pets. However, nearly 80% of the world's dogs survive on their own, on streets, living as scavengers, depending on humans as resources. This talk will be a brief review of our work over the last 9 years, which has revealed that dogs live in family groups, help each other in raising pups, face threats from humans and learn to live among humans through adaptive behavioural responses. At the end of my talk, I intend to raise a rather philosophical question of whether our pets are slaves of our wishes, and whether they deserve such lives.

### Anindita Bhadra



I am a faculty at the Department of Biological Sciences, Indian Institute of Science Education and Research Kolkata, one of the premiere institutions of India. I teach at the undergraduate and postgraduate levels, which I thoroughly enjoy. I received my PhD in 2008 from the Indian Institute of Science, Bangalore, working with Prof. Ragahendra Gadagkar. For my PhD I worked on the politics of a wasp society. When I joined IISER Kolkata, I established my own research group, choosing to work on a new model system, exploring questions of my own. I have faced many adversities in my career because of my gender, and I try to sensitize my students and colleagues about these issues actively. I was involved

in the founding of INYAS, which I headed for three years. I am member of the GYA, co-leading a working group and an incubator. I am actively engaged in science promotion and outreach, for INYAS, the GYA and my institute. I am a proud mother of two children (11 and 6), and my family is my first priority. In addition to my academic life, I am actively engaged in theatre; my husband (a physicist) and I run a professional theatre group.

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### **The Babesia caballi Spherical Body Protein 4 (SBP-4) is recognized by antibodies in sera from B. caballi infected equids in Egypt and has potential for developing novel serological diagnostic methods**

Mona S. Mahmoud, Omnia M. Kandil, Nadia Abu El-Ezz, Seham M. Hendawy, Bassma S. and Saurez, C.

Veterinary Research Division, National Research Centre, Egypt

A competitive inhibition ELISA diagnostic kit based on a monoclonal antibody to Bc48, lacked the ability to detect specific antibodies of *B. caballi* strains in Egypt, Israel and South Africa. This study describes investigations aimed to defining the SBP4 of *B. caballi* as an alternative specific antigen that could be used for the detection of *B. caballi* strains circulating in Egypt. The *B. caballi* recombinant SBP-4 (r-SBP4) protein derived from an Egyptian isolate of *B. caballi*, was purified by

immuno-affinity and immunologically tested. The purified r-SBP4 shows a single 37 kDa band upon Coomassie blue staining of SDS-PAGE gels, which reacts with anti-HIS antibodies in Western blot analysis. The pattern of reactivity of the purified r-SBP4 against antibodies in the sera of equids infected with *T. equi* and *B. caballi* from an equine population was studied. No cross-reactivity was detected when using *T. equi* positive serum, suggesting that the r-SBP4 reacts specifically with *B. caballi* infected sera. A total of 191 equids sera were tested by *B. caballi*-IFA slides of VMRD Inc. and a novel SBP-4 I-ELISA. Hence, r-SBP4 could be considered as a candidate for developing a reliable serological test that can be used to detect *B. caballi* infection in Africa.

### **Mona Said Mahmoud**



Prof. Mona is head of veterinary research division at national research center. She was graduated from Veterinary College, Cairo University in

1984 and became a professor in 2008. During her academic period of more than 30 years, she was involved in research, education & extension activities on tropical parasitic diseases so as to minimize economic losses to livestock industry by way of improved diagnosis and control with an ultimate aim to enhance the socio-economic status of farmers. Her major research interests include epidemiology, diagnostics, immuno-modulatory and immuno-prophylactic approaches for the management of bovine and equine piroplasmiasis, cryptosporidiosis and



parasitic zoonoses as well as vector borne parasitic diseases. She is an internationally experienced researcher. She had undertaken duty travel to many countries in, Asia, Europe and United States as Post-doctoral researcher. Her current research is focused on the molecular evolution and epidemiology of parasitic diseases. The main goal is to understand the immunology in babesiosis, as well as the development of novel diagnostic techniques and vaccines. She is a regular reviewer and Editor in international scientific journals. She had several records in GenBank and submitted two Patents.

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### **Production of lignans, anticancer precursors, in in vitro cultures of Flax (*Linum usitatissimum*)**

**Ahmed M.M. Gabr, Hoda B. Mabrok, Kadry Z. Ghanem, Mohamed K. El-Bahr, Michael Blaut and Iryna Smetanska**

Department of Plant Biotechnology, Genetic Engineering & Biotechnology Research Division, National Research Centre (NRC), Egypt.

Plant biotechnology techniques represent a potential source of valuable secondary metabolites which can be used as food additives, nutraceuticals, and pharmaceuticals with significant amounts which are not always easily available. Flaxseed is the richest plant source of lignans in the time that plant foods containing lignans is very limited. The major lignans from flaxseed (*L. usitatissimum*) are secoisolariciresinol diglucoside (SDG), secoisolariciresinol (SECO) and matairesinol (MAT), which are

further metabolized to the mammalian lignans enterodiol (ED) and enterolactone (EL) in the large bowel by intestinal bacteria. In vitro and in vivo studies have proved that lignan-rich diets help reduce risk of various hormone-dependent cancers, heart disease and osteoporosis. There is evidence that ED and EL have potential health benefits in humans particularly against hormone-dependent diseases such as breast and prostate cancer. Several hypotheses are suggested that lignan compounds in flax cells are considered a defense response against pathogens. We successfully established a suitable and efficient protocol for hairy root transformation of *L. usitatissimum* from callus culture to accumulate plant lignans. In addition, the hairy root of *L. usitatissimum* showed antioxidant and anticancer activity. In the future, our protocol described here should be useful in studying lignan biosynthesis in *L. usitatissimum*.

### **Ahmed M. M. Gabr**



Dr. Ahmed is professor of Plant Biotechnology at National Research Center (NRC). He had BSc. Degree in Horticulture, Faculty of Agriculture, Cairo University, Egypt. He got his Ph.D. Degree in ornamental plant and plant physiology from faculty of agriculture, Cairo University, Egypt. He was visiting scientist at department of methods in food biotechnology, Institute of Food Technology and Food Chemistry, Faculty of Process Sciences, Berlin University of Technology, Berlin, Germany (2009 to

2011). He got diploma in Management of Technology (MOT), Nile University, Cairo, Egypt. (March 2013- To May 2014). He had 3 travel grants to Germany as Post-doctoral scholarship in University of Applied sciences, Weihenstephan-Triesdorf, Germany. (2015 and 2017). Dr. Ahmed is supervisor for 5 Ph.D students and 3 MSc students in the fields of Plant Biotechnology. He is principle investigator (PI), Co-PI and member for several national and international projects in the field of plant biotechnology. He published 32 manuscripts in national and international journals. He has several administrative activities as member at technology innovation and commercialization office and as focal point for research development and innovation (RDI) program at ministry for Scientific Research, Egypt which is funded from EU. He is focal point for E-Science Program, ministry of scientific research, Egypt. He is member of project formulation committee - National Research Center, and focal point for Egyptian Science, Technology and Innovation observatory (ESTIO), ASRT, Egypt.

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## **An overview on fish production in Egypt and how to achieve its sustainability**

Sahar F. Mehanna

Fish Population Dynamics Lab, National Institute of Oceanography and Fisheries, Egypt

Fisheries including aquaculture contributes to food security and nutrition and plays a vital

role in global, national and rural economies as it provides incomes to up to 300 million people, directly or indirectly. The coastal fisheries are potentially threatened by the ongoing progressive migration of people towards coastal areas, particularly coastal urban centers, where about 60% of the world population already live. The rapid and continuous increase in fishing intensity during the last half century has had a great impact on the aquatic ecosystem, the resources and the market. This impact is evident in the depletion of resources, the degradation of the environment and the evolution of supply, demand and prices. A growing aquaculture sector may bring relief but does not totally resolve conflicts resulting from ecosystem degradation and non-equitable access to available resources. In Egypt, the contribution of aquaculture to total fishery production has increased and has exceeded production from natural resources (up to 77% of the total production now). In Egypt, we face many challenges in both natural and aquaculture sectors and we try to overcome some of these threats. This talk will discuss the fish production from both sectors history in Egypt with its current situation and future perspective for its sustainability.

### **Prof. Sahar F. Mehanna**



I am working for National Institute of Oceanography and Fisheries, Egypt since 1988. I started as researcher assistant in Fish Population Dynamics Lab until achieving a full professor in 2013. I am a member in many organizations, reviewer in 25 scientific journals, supervisor of 35 MSc and PhD thesis, shared in 25 national and international projects, published 150 research papers in national and international peer reviewed journals and shared in 5 books, attended 55 international conferences with talks, visited

most of the world countries in official missions. I am the head of Fish Population dynamics Lab from 2005 – 2011 and from 2013 – now and were the director of Red Sea branch of NIOF and also the branch of Suez and Aqaba Gulfs. I was the Head of fisheries division in 2014-2015. I am teaching the fisheries science to undergraduate and post graduated in a number of Universities. I am external examiner for many international Universities (India, Jordan, Sudan, American University)

## Internet for Biological Control of Agricultural Pests

Rania A.Abd El-Wahab

Plant Protection Research Institute,  
Agricultural Research Center, Egypt

Biological control of mites and insect are being transformed to be remoted through internet of things (IoT) technology. IoT can control many instruments and systems to call specific predators even through direct voice or light which used as a chicanery against pests. Achievements are appeared in greenhouses infested with the piercing sucking mouth parts pests such as the two-spotted spider mite, *Tetranychus urticae* and insects with biting mouth parts as *Spodoptera littoralis*. The full automated system depended on specific protocols including the wireless protocol that used sensors, Arduino, geographic information system (GIS), global system for mobile communication (GSM), etc., for data collection, processing, and others. They are working through pest monitoring, data transference and then decisions related to the activation of the

distinctive procedure automatically. Robots and drones with light emitting diodes (LEDs) caused more than 90 and 85%, respectively, reduction of infestation with most used colors by attracting specific predators to *T.urticae* and *S.littoralis*. While, bioacoustics system caused approximately 80 and 70%, respectively. In other words, the precision agricultural system is so close for being applied to control mites through IoT as an advanced technology in both open fields and greenhouses successfully. Internet of biological control could be amenable to the viable integrated pest management specifically in the developing countries in order to get a full ecofriendly system with no side effects.

### Rania A. Abd El-Wahab



Dr. Rania has experience in Mites of Cotton and Field Crops Dept., Plant Protection Research Institute, Agricultural Research Center and ministry of Agriculture. She has expertise in Biological Control with advanced sciences as nanotechnology, electronics and renewable energies. She is associate professor from 2015-till now.

Dr. Rania has the following academic background: She was graduated from faculty of Agriculture, Mansoura University, Dakahlia, Egypt and got her PhD of Pesticides toxicology and Resistance, Pesticides Dept. 2010. She represented Egypt officially in Chinese Declaration of Climate Change and Ecosystem 2015 through IUCN. She has experience of nanotechnology and other

advanced sciences in precision agriculture and published many scientific research papers at international journals and conferences in Egypt, UAE, Oman, Jordan, Croatia, Serbia and China. Dr. Rania gained over 23 international awards for inventions and applied research related to the effects of solar energy and light emitting diodes (LEDs) against agricultural pests from Egypt, South Korea, Malaysia, Canada, Serbia, Poland, Germany, Russia, Romania, Thailand, Croatia, India and others. She is keynote speaker and a jury member at international events and conferences related to nanotechnology, advanced electronics to control pests, and others about innovation, scientific research, entrepreneurship, and social development. She is member of certain international electronic engineering associations, organizations and others for biological and environmental sciences.

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### **Green and nano acaricide from rosemary essential oil for control the two-spotted spider mite**

Abdel-Tawab H. Mossa, Sahar I. Afia, Samia M. M. Mohafrash, Badawi A. Abou-Awad

Pesticide Chemistry Department ,National Research Centre (NRC), Egypt

This study was dizzied to prepare nanoformulation of rosemary essential oil (EO) and study their acaricidal activity against the two-spotted spider mite and acute oral toxicity on rats. Rosemary EO was analysis by GC/MS and the major active compounds were 1,8 cineole, borneol,  $\alpha$ -pinene, D-limonene,

L-linalool, D-camphor,  $\gamma$ -terpinene, linalyl acetate,  $\alpha$ -terpineol, and p-cymene were the major components. Nanoemulsion of rosemary essential oil with droplet size 139.9 nm was formulated by ultrasonic for 6 min. Spray application of rosemary nanoemulsion showed high acaricidal activity against immature and adult of the two-spotted spider mite *T. urticae* with LC50 723.71 and 865.68  $\mu\text{g/ml}$  and the toxicity increased by 54.15% and 52.69% of immature and adult, respectively. No signs of toxicity or mortality were recorded in rats treated by rosemary nanoemulsion so it may consider nontoxic to mammals. High acaricidal activity, stability, and safety of rosemary nanoemulsion make this nanoformulation as a possible green and nano-acaricidal product. More study is needed to evaluate the effect of rosemary nanoemulsion on the predacious mites and their acaricidal activities under field conditions.

### **Samia M. M. Mohafrash**



Dr. Mohafrash is associate professor at National Research Centre. She has successfully completed her Administrative

responsibilities as associate professor. Her research includes green and nanopesticides, toxicology and environmental toxicology. She is serving as an editorial member and reviewer of several reputable journals like *Frontiers in Environmental Toxicology* “Associate Editor” and *Human & Experimental Toxicology*.

## Natural Resource in Egypt

**Noura Bakr** and Mohamed H. Bahnassy

Soils and Water Use Department, National Research Centre (NRC), Cairo, Egypt

The total area of Egypt is around one million square kilometers and occupied by over 95 million inhabitants who live on about 4-5% of this area. In this research, an overview of the Egyptian natural resources, mainly; land, water, and human resources in Egypt will be provided. Geographically, Egyptian territory is divided into five sections: Western Desert, Eastern Desert, Sinai Peninsula, Nile Valley, and Nile Delta. Their lands are ranged from completely sand areas to heavy clayey soils in the Nile Valley and Delta. The Egyptian agricultural lands could be classified as Old lands in the Nile Valley and Delta and Newlands (newly reclaimed areas). The primary water source is the annually fixed share of Nile River of 55.5BCM that is utilized for almost all human activities despite the high growth rate of population. The Egyptian government adopts strategies to utilize the non-conventional water resources (mainly recycled agricultural drainage, shallow groundwater, and treated wastewater) in irrigation as the agricultural sector consumes 80–85% of available fresh water in Egypt. At the administrative level, Egypt involves 27 governorates in which New Valley governorate represented 42% of total Egypt's area and occupied with only 0.25% of the Egypt total population. Conversely, the Great Cairo (involves Cairo, Giza, and Kalyoubia governorates) occupied by around 25% of the total population. Agricultural sector supports the livelihood

to approximately two-thirds of the Egyptians and considers the primary source of income to about 60% of Egyptians.

### Noura Bakr



Noura Bakr was graduated from Faculty of Agriculture, Alexandria University in 1999, with a Bachelor of Soil and Water Sciences. She got her Master of Science in Soil and Water Sciences from the Faculty of Agriculture, Alexandria University in 2003. She worked as a test debugger in Fujitsu Services Limited, Egypt, from 2003 to 2004. She was employed as a research assistant in Soils and Water Use Department, National Research Center (NRC), Cairo, Egypt in 2004 and re-enrolled at Alexandria University to pursue her doctoral degree in 2005. In 2008, she won a chance to be a visiting research associate in the School of Plant, Environmental, and Soil Sciences (SPESS), Louisiana State University Agricultural Center (LSU-AgCenter), USA, and was funded by the Egyptian government for two years. Then she won an assistantship to complete a full doctoral degree at Louisiana State University in 2010. She got her Ph.D. in Environmental and Soil Sciences from LSU, USA in 2013. She is officially holding a "Researcher" position in Soil and Water Use Department, NRC, Cairo, Egypt (from 2014 till now). Her interests include the utilization of advanced technology (geographic information system, remote sensing, and statistics) to perform applied research related to natural resource management and land use planning

mostly in new reclaimed areas that are sensitive to any change in their ecosystem and have limited water resources. She participate in several projects as PI, Co-PI, and team member.

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## Hydrogenotrophic methanogenesis: the ugly fact of the dairy industry

Mohamed El-Sherbiny, Adam Cieślak, Malgorzata Szumacher-Strabel

Department of Dairy Sciences, National Research Centre, Egypt

The term sustainability deals primarily with covering the rising needs of every living being without the negligence in requirements of future generations. The three pillars of sustainability are environmental responsibility, economic viability, and social acceptability. Interestingly, agriculture contributes in all three pillars of sustainability in both positive ways; by triggering the worldwide economy and social acceptability, and negative way; being a source of environmental pollution and high concentration of greenhouse gasses (GHG). It was estimated that dairy farms contribute in no less than 3% of the total GHG, that is in addition to a loss in feed energy by up to 12% in the form of emitted methane. Developing strategies to mitigate methane from dairy cows represents an inevitable challenge in both environmental and economic perspectives. On 2003, a decision was implemented by the European Commission mainly to ban on using

chemical supplements in ruminant nutrition which has been effective since January 2006. This change in laws resulted in an intensive development of research that relates to finding effective natural compounds that could inhibit GHG. Our presented research was based on implementing Alfalfa silage; rich in plant secondary metabolites, in dairy cows diet to decrease the methane production in the rumen.

## Mohamed El-Sherbiny



Mohamed El-Sherbiny is a researcher at the department of dairy sciences at national research center, Egypt. He holds a PhD degree in animal science from the Poznan University of Life Sciences - Poland. Mohamed conducts research in the ruminant science field that relates to ruminant nutrition, feed management, product quality and mitigation of greenhouse gases. He is the author of more than thirteen original scientific manuscripts published in high impact journals (Ex. Journal of Dairy Science, Animal Feed Science a, d Technology ... etc.). He is also a frequent reviewer for many scientific journals, and lately, he co-founded the Egyptian Society of Ruminant Nutrition.

## Escherichia coli between food and children in Egypt

Samy Mohamed Abdelhamid

Food Sciences and Nutrition Research Division, National Research Center, Egypt

In spite of finding Escherichia coli as a common and commensally bacterium in the gastric system of most animals and human being it is now considered as one of the common diarrheagenic bacteria within the family Enterobacteriaceae under Genus Escherichia. Strains of E. coli that cause diarrhea are of six major categories: Enterohemorrhagic (EHEC), Enterotoxigenic (ETEC), Enteroinvasive (EIEC), Enteropathogenic (EPEC), Enteraggregative (EAEC) and diffuse-adherent (DAEC). Each category of the diarrheagenic E. coli comprises a separate set of O: H serotypes, and has distinct virulence attributes resulting in distinctive clinical syndromes and characteristic epidemiologic patterns. Methods of classic microbiology identification, kits for rapid detection of the bacteria and shiga-toxin and PCR were used in the study. The current study focused upon the investigation of incidence of Diarrheagenic Escherichia coli and shiga toxin producing Escherichia coli in dairy and dairy products, food and food products and in diarrheal cases within children before 5 years old. All categories of Escherichia coli were isolated from the samples with different percentages and shiga toxin STxs was also detected in E.coli isolates from some food and children

diarrheal samples. Furthermore, the investigation encompasses studying some factors affecting E.coli bacterial growth as gamma ray and probiotic lactic acid bacteria. In conclusion, E. coli bacteria pose a direct threat to public health in Egypt, especially to children, who need crucial health measures to prevent and prevent their presence on the environmental level.

### Samy Mohamed Abdelhamid



Dr Samy got his PhD from Al-Azhar University in 2015 in microbiology under thesis titled: "Studies on Enteraggregative, Shiga toxin, and Verotoxin producing Escherichia coli and their interactions in Egyptian foods and milk". He works at the Centre of Excellence and Advanced Sciences at National Research Center, Egypt in group of dairy microbiology (January 2007 – August 2010) and group of bacteria transmitted by food (September 2010 – Until now). He presented 15 papers on various topics in dairy and food microbiology. He is a member of five local projects in probiotic and its application in dairy fields with synergism and antagonistic effect of some medical plants with pathogenic and lactic acid bacteria and two other international projects where one of them is in virology (Enteric viruses) and the other one in autism.

## Organic Farming and Good Agriculture Practices for Sustainability of Agriculture

Fawzy, Z.F., Li Yunsheng, Shaymaa, I. Shedeed  
Agriculture and Biological Research Division -  
National Research Centre - Egypt

Agricultural production in most parts of the world will face less predictable weather conditions than mankind experienced during the intensification of agriculture over the last century. Especially Arab region and Southern Africa could suffer negative impact on several crops when no investments will be made into improved addictiveness of the production systems. Besides specific technical measures (irrigation, breeding for drought improved or heat tolerant crops), the resilience of whole production systems is a very important focus. Organic agriculture is a highly knowledge-based technique for manipulating complex agro-ecosystems, for breeding locally adjusted seeds and livestock, and for producing on-farm fertilizers and inexpensive nature-derived pesticides. Such knowledge is a crucial 'reservoir of adaptations'. Organic agriculture, by its very definition, reduces harm to the environment, for example through the reduction or elimination of polluting substances such as pesticides and nitrogen fertilizers, water conservation practices, soil conservation practices, restoration of soil fertility, maintenance of agricultural biodiversity and biodiversity etc. Good Agricultural practices (GAPs) are designed to enhance the safety of vegetables and fruits by the implementation of safer harvesting, handling, production and packing

practices. The goal is the prevention of contamination of fresh produce either in the natural environment or in the handling, packing, and selling of vegetables. A necessary component is the provision of necessary education and training to workers at all levels on farms. Adoption of these measures by vegetable producers will help prevent contamination of water resources, improve public perception of the industry, and perhaps eliminate the need for mandatory regulations. This manuscript reviews the role of organic agriculture and good agricultural practices in achieving sustainable agricultural development.

### Zakaria Fouad Fawzy



Zakaria Fouad Fawzy - Professor - National Research Centre and Assessor in Egyptian Accreditation Council. He is Coordinator of Global Alliance for Climate Smart Agriculture – FAO, Rome. Furthermore, he is the first Egyptian researcher attended of the talented young scientist program in China. He got an opportunity for more than two international projects in Egypt as a principal investigator about Climate Changes Issues in China and Egypt. Dr Zakaria is professor in the Agriculture and Biological Division, National Research centre since 2013. Also, he is Assessor in the Egyptian Accreditation Council. Dr Zakaria is Former President of the Youth Scientific Research Association. He was attended many scholarships and fellowships such as , scholarship “ PostDoctor “ in china from 2011 to 2012 and fellowship “ Talented Young Scientists Program” in China from 2014 to 2015. He



created about four Memorandum of Understanding “MoU” and Memorandum of Agreement “MoA” between National Research Centre and other international scientific organization such as – Institute of Geographic Sciences and Natural Resources Research- Chinese Academy of Sciences and Beijing Institute of Technology- Ministry of Science and Technology – China. He is a member in many scientific organizations and acts as reviewer and referee as well as board member in the field of organic agriculture and climate changes issues for different national and international journals and organizations. Also, Dr. Zakaria won many awards and he was attend a huge number of conferences, training and workshops in Egypt and other many countries in worldwide as well as he was published five scientific books and more than 45 scientific research paper. Dr. Zakaria contributed significantly to the expansion of knowledge of organic agriculture and climate changes issues through public lectures on scientific research centers and various Egyptian and Chinese universities where he contributed significantly in helping to learn organic agriculture and climate changes and using smart climate agriculture as a new trend in the field of agriculture.

### Are natural insecticides safe?

Abdel-Tawab H. Mossa

Pesticide Chemistry Department-National Research Centre, Egypt

Long-term application and extensive use of synthetic insecticides have resulted in accumulating their residues in food, milk, water, soil and cause adverse health effects to human and ecosystems. Therefore, the application of natural insecticides in agriculture and public health sectors has been increased as an alternative to synthetic insecticides. The question here are all-natural insecticides safe. Therefore, the work presented here focuses on the safety of natural insecticides. Natural insecticides contain chemical, mineral and biological materials and some products are available commercially, e.g., pyrethrum, neem, spinosad, rotenone, abamectin, *Bacillus thuringiensis* (Bt), garlic, cinnamon, pepper, and essential oil products. Some natural pesticides can induce adverse toxic effects to mammals and ecosystems. In this respect, the term “natural” is not synonymous with “organic” and not all-natural insecticide products are acceptable in organic farmers.

### Abdel-Tawab H. Mossa



Dr. Mossa is working as Professor at National Research Centre. His research has included pesticides chemistry, environmental toxicology, green and nanopesticides. Based on this research and fellowship training he has received several awards and honors, such as NRC award of research output 2011,2012,2013,2014. He is serving as an editorial member of several reputed journals. He has over 65 publications and H-index is 13 in Scopus and 19 in google citation. Dr. Mossa is member in National

Committee of Toxicology, Academy of Scientific Research and Technology and Scientific Committee of the Rehabilitation Center, the repositories of NLA, Egypt.

## Producing vegetable crops under deficit irrigation water in arid and semi-arid regions

Sameh M. El-Sawy

Agriculture and Biological Research Division, National Research Centre, Egypt

Actually, arid lands cover around 47% of earth's land surface, these regions experience to a combination of high temperatures and low rainfall. However, in the arid areas the water scarcity is the most serious, as well as climate change impacts are reflected upon different sides of life there, especially the quantity and the time of the rains. On the other hand, the global human population is growing fast and it has been estimated that the world population would reach about 10.5 billion by 2050, so that there is a higher need for food. In fact, Egypt is located in the arid and semi-arid regions, which experience to the limited water resources and increasing the population. As indication of scarcity in absolute terms, often the threshold value of 1000 m<sup>3</sup>/capita/year, is used, Egypt has passed that threshold already now. In addition, Agriculture consumes the largest amount of the available water in both countries, its share exceeding 80% of the total demand for water. Producing vegetable crops in arid and semi-arid regions demands integrated irrigation water management to increase the water use

efficiency, which achieved by using the modern irrigation systems. One of the best ways for improving the water use efficiency in arid and semi-arid areas is using subsurface drip irrigation system. Especially with new underground pipe, the full and intermittent infiltration pipes which produced by Environmental Engineering Research Institute, Ningxia University. This pipes have a high efficiency for saving irrigation water and it works well under the high temperature and UV conditions. Furthermore, using new technology for saving irrigation water through smart irrigation devices and using wireless sensor networks, is considered a breakthrough for producing vegetable crops in arid regions, using the green energy (solar and wind energy) for supplying these devices by the power. The complementary water-saving irrigation system has a soil temperature and moisture sensors to control of the irrigation amount, which connected by wireless using the smart irrigation apps in the mobile to control and adjust the irrigation time. The wind-solar complementary water-saving irrigation system can be used in Arab countries to overcome the water scarcity and increase the productivity of vegetable crops in arid and semi-arid regions.

### Sameh Mohamed Mohamed El-Sawy



Dr. Sameh is researcher at Vegetable Research Department, agricultural and biological research division, national research center, Egypt. He was researcher at environmental engineering

research institute, Ningxia University, China according to "Talented Young Scientists Program", under "Saving irrigation technology in arid regions of intelligence". Dr. Sameh Participated at several research projects as "Improving the tolerance of wheat and beans for the severe salinity, drought and heat for the sustainable production in Egypt" & "producing the vegetable crops by using environmentally friendly techniques with liming of the emissions to avoid the impact of climate change" & "Application of selenium use as a fertilization of field and horticultural crops for Biofortification and improve productivity" and "Increasing productivity and quality of some vegetable crops for local market and exportation needs (onion – pepper – green beans – broccoli)".

### **Effect of some preservative treatments and modified atmosphere packaging during transit periods on the keeping quality of Solidago Canadensis cut flowers.**

Ghada M.R. El-Shawa; Magda M.El-Saka and Omaira Abd El- Kafie

Horticulture Research Institute, Agriculture Research Centre, Egypt

The present investigation was carried out during two seasons to study the effect of some preservative solution treatments, packaging materials and cold storage periods in keeping quality of Solidago canadensis. The obtained results indicated that, spraying flowers with 5 ppm BA +1ml/L Voporgard then placed in 2%

sucrose+200 ppm 8-HQS solution, significantly increased the vase life, maximum increase of fresh weight %, decreased bacterial counts on vase solution, increased chlorophyll content, carotenoid, total, reducing, non-reducing sugar and decrease proline. While spraying with 5 ppm BA +1ml/L Voporgard then placed in 200 ppm 8-HQS solution recorded the highest water uptake. Packaging with Kraft paper and storage at 3 °C for 1 week increased vase life, maximum increase of fresh weight %, and recorded the highest water uptake. The treatment of interaction between packaging with Tissue paper and storage at 3 °C for 1 week recorded the longest vase life, the highest value of maximum increase of fresh weight % and highest amount of water uptake. The treatment of interaction between packaging with Kraft paper and storage at 3 °C for 1 week resulted decreased in bacterial counts on vase solution, increased chlorophyll content, carotenoid, total, reducing, non-reducing sugar and decrease proline

### **Ghada Mohamed Ramadan Elshawa**



Dr. Ghada is researcher at the Department of Ornamental and Landscape research, horticulture research institute, agricultural research center, Giza, Egypt. Dr. Ghada received her PhD in agricultural sciences from Mansoura University at the Department of ornamental plants and worked as a researcher in ornamental plants. Dr. Ghada has some research in this field. She participated in the

organization of many conferences and scientific symposiums in the field of ornamental plants.

### **Impact of Stress and Nitrogen fertilizer Sources on some nutrients and grains quality of Maize**

Hammad, S. A.; A. M. El - Ghamry; M. H. Rabei; M. A. Seeda and E. M. Rashwan

Soil Fertility and Plant Nutrition Department, Agriculture Research Centre, Egypt

Two field experiments were conducted at Soil Department Greenhouse, of Agriculture Faculty, Mansoura University, during 2007 and 2008 summer seasons using maize plant to investigate the effect of water stress and nitrogen fertilizer sources on growth, yield and yield components of maize plants. Twenty-four treatments were arranged in strip split split design which were the simple possible combination between two treatments of irrigation (Normal irrigation 100% of field capacity and stress irrigation 60% of field capacity ), three treatments of mineral nitrogen fertilizer at rates of (0,50,100% from the recommended doses ), two treatments of organic nitrogen as farmyard manure (with and without FYM ) and two treatments of nitrogen biofertilizer (inoculated with *Azotobacter chroococcum* and uninoculated one). Results indicated that Water stress significantly decreased maize plant dry weight, straw and grains. While, those parameters increased by increasing mineral nitrogen, FYM and inoculation of

maize grains by *Azotobacter* in both seasons. The N, P, K, Ca and Mg maize leaf or grains content decreased by water stress but Na increased, on the other hand these characters increased by either increasing nitrogen fertilizer rates or by FYM additions and with inoculation by biofertilizers. Water stress significantly decreased maize grains protein and NO<sub>3</sub>-1 but increased grains carbohydrates content. Increasing application of mineral nitrogen rates, addition of organic and biofertilizers significantly increased the protein, NO<sub>3</sub>-1 and carbohydrates percentages in maize grains. Thus, it could be concluded that the nitrogen fertilization at the rates of 100% (260.87 Kg urea fed-1 of recommended doses) and adding FYM at 25m<sup>3</sup>fed-1 with inoculation of maize grains by *Azotobacter* under normal irrigation are considered as most suitable treatment for obtaining the highest yield of maize under these experimental conditions. In addition, the organic and biofertilizer had an important role in reduce the negative effect of water stress on maize plants and helping for reducing both the pollution factors and the economical maize production costs.

#### **Eman Mahmoud Rashwan**



Eman Mahmoud Rashwan is a researcher at the department of Soil Fertility and Plant Nutrition at soils, Water and Environment Research Institute, Agricultural Research Center, Giza, Egypt. Dr. Eman received her PhD in agricultural sciences from

Mansoura University at the Department of Soils Sciences and worked as a researcher at department of soil fertility and plant nutrition.

## Functional genomics analysis for stem rust resistance in durum wheat

Lamiaa salah Elden Elsaid

Agriculture Genetic Engineering Research Institute (AGERI), Egypt

Stem rust is the most destructive disease of wheat worldwide and middle Egypt, Crop species belonging to the tribe Triticale represents the main food stuff sources for humans. Most of the stem rust genes are temperature sensitive and the highest disease severities reflected to temperature change, its contain a pool of genes that are expressed for wide environmental adaptability .To investigate and understand the genetic response of stem rust resistance in durum wheat, differentially expressed sequence tags (dESTs) were detected, characterized and cloned from durum wheat under different stem rust stress and the functions of some of these dESTs were determined.

### Lamiaa salah el den elsaid



Dr. Lamiaa has PhD in genetic engineering at genetic engineering research center and biotechnology – bioinformatics department. She got her master degree from

biochemistry department, faculty of agriculture, Cairo University. She got diploma in bioinformatics, Wep Master in CIW foundation at NIIT Company and diploma in biochemistry. She works as researcher at AGERI, Giza, Egypt.

## Enhancement the biological efficiency of Rhizobiumleguminosarumbv. trifolii through different formulation processes

Dalia A Abd El-Fattah, Wedad E Eweda, Mona S Zayed, Mosaad K Hassanein

Central Laboratory for Agricultural Climate, Agricultural Research Center, Egypt

Diverse formulations were prepared using (sodium alginate, mixture of peat moss and vermiculite 1:2 (w/w), wheat bran, peat moss, rice husk and clay). Each carrier material was packed in polyethylene sheets and then divided into three sets. The first set was autoclaved at 121°C for 20 min., the second one was exposed to gamma irradiation at a dose rate of 4.0 kGy for 1 hour, while the third set was left without sterilization. Inoculated carriers were divided into two parts. The first part was preserved at 8°C and the other part was kept at 30°C for 6 months. While non-sterilized inoculated carriers only survived for 3 months, no contaminants have been detected in all sterilized carriers. Rhizobium leguminosarumbv. trifolii subjected to alginate formulation exhibit high stability during the incubation period (6 months) at 30°C and 8°C, being 11.905 log 10 CFU/g. Inoculated carriers, that exhibit

survival cells equal to or more than 108 CFU/ml after 6 months were selected to evaluate their biological efficiency using plant infection technique. *R.leguminosarumbv.trifolii*, formulated on alginate and kept at 30oC and 8oC gave the highest nitrogenase activity, being 97.00 and 95.80  $\mu$  Mole C<sub>2</sub>H<sub>4</sub> /plant /h respectively. Followed by those formulated on autoclaved clay incubated at 30oC, being 89.30  $\mu$  Mole C<sub>2</sub>H<sub>4</sub> /plant /h.

### Dalia A Abd El-Fattah



Dalia Ahmed Abd El-Fattah is assistant Professor at the central Laboratory for Agricultural Climate, Agricultural Research Center. Dr. Dalia is director in charge, Spawn production lab, Mushroom Research and Production Unit, Central Laboratory for Agricultural Climate, Agricultural Research Center. Dr. Dalia was post doctor fellow for sustainable agriculture, China 2017-2018. Dr. Dalia participated and organized several workshops for undergraduate, post graduate and professors regarding identification of the bacteria, lab biohazard, mushroom cultivation and recycling organic wastes. During her work at the spawn production lap, she organized a free of charge weekly theoretical and practical training course for public e.g. housewives, graduated and retired people to increase the awareness and the importance of recycling agro-wastes by using them in profit projects for the low-income, graduates and unemployed people to produce healthy

food with a low budget and higher income. Dr. Dalia participated in several research projects such as the regional project for pilot unit of production of Frankia inoculated Casuarina seedlings. (1995-to 2003) & others in association with Unit of Biofertilizer, Ain Shams Univ., Cairo, Egypt; Desert Development Center, American Univ. in Cairo, Egypt; Faculty of Science, Suez Canal Univ. Ismailia, Egypt; Timber Tree Research Section, Ministry of Agriculture, Egypt; Cairo-MIRCEN; and ORSTOM/CIRAD- France, etc. She is involved in several national and international other projects

### Fate of Certain Pesticides in Presence of Biochar in Cultivated Soil.

Ghada N. EL-Masry & Kari Tiilikkala

Plant Protection Institute, Agriculture Research Center, Egypt

Recycling of agriculture wastes can be processed into value added products such as biochar .Biochar from date palm fronds was produced through slow pyrolysis at 450 OC done in a batch retort. The identification of the chemical composition of biochar by using Fourier Transform Infrared spectroscopy, (FTIR) and elemental analysis show that there are function group found around the biochar structure. Its physical characterization by using XRD., Surface area (BET ) found to be 96.4 m<sup>2</sup>/gm and its Particle Size Distribution (DLS) had mean size of 172.5 nm and 41.4 nm width. Biochar-amended soil were prepared by thoroughly mixing

the soil with accurately weighed of biochar of percentages of 0, 10 and 25 % (w/w). Onion was plant in a sand soil. Two pesticides (Acetamidrid and Oxamyl ) were applied . Residues were extracted inside onion blubs after 1, 3, 7 and 14 days from application. It is clearly proved that the half-life time of both pesticides are increased in the soil contain biochar. In addition to the leaching of pesticides from the agricultural soils to the run out water show statistically significant as the soil contain biochar had no pesticide residues after application.

### Ghada Nabil El-Masry



Dr. Ghada is researcher at Cotton Pesticides Evaluation Department - Plant Protection Research Institute, Agriculture Research center. She is responsible for national program for evaluation of pesticide. She Engaged with the Finland community on the reuse of the agriculture wastes. Dr. Ghada assisted with teaching students on Technology Of Agriculture, Zagazg University and developed new use of pyrolysis product of agriculture wastes.

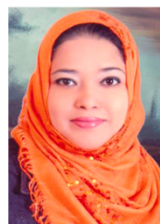
### How can we feed our growing planet in 2050?

Nermeen Y. Abass and Rex A. Dunham

Department of Agricultural Botany, Faculty of Agriculture, Alexandria University, Egypt

Millions of human beings are hungry and most of them live in developing countries. One in nine people in the world in 2014 to 2016 were suffering from chronic malnourishment. The global population expected to grow by 30% and reach 9.6 billion people by 2050. We must meet the huge challenge of feeding our planet. Fish is a major source of animal protein in most developing countries and, in developed countries. Growth hormone (GH) is a pituitary hormone, which is essential for normal somatic growth. Channel catfish, *Ictalurus punctatus*, GH cDNA driven by the ocean pout antifreeze protein promoter (opAFP-ccGH) or rainbow trout metallothionein promoter (rtMT-ccGH) were transferred to the channel catfish via electroporation. The present study was designed to compare the growth performance between transgenic channel catfish GH cDNA and their full-siblings. Body weight among the transgenic individuals and their full siblings was different at all ages ( $P < 0.001$ ). Catfish transgenic for opAFP-ccGH grew 1.67-2.8 fold larger than their full siblings and those transgenic for rtMT-ccGH grew 1.51-3.16 fold larger than their full siblings. GH transgenic meat technology could be highly beneficial to the aquaculture industry in the future to feed 9.6 billion people expected in the world by 2050.

### Nermeen Youssef Abass



Nermeen Youssef Abass Youssef graduated from Faculty of Aquaculture Saba-Basha, Alexandria University, Egypt excellent

obtained her Doctor of Philosophy (PhD) in fish genetics from School of Fisheries, Aquaculture and Aquatic Sciences, Auburn University, AL, USA, 36849. She has been a research associate at College of Agriculture, School of Fisheries, Aquaculture and Aquatic Sciences, Auburn University, AL, USA since 2015 and Assistant lecturer of fish genetics at Agricultural Botany Department, Faculty of Agriculture Saba Basha, Alexandria University, Egypt since 2010. She has been teaching at Faculty of Agriculture Saba-Basha, Alexandria University, Egypt as a demonstrator since 2007. 2013-2015: Visiting Scholar, Auburn University, School of Fisheries, Aquaculture and Aquatic Science, Auburn University, AL 36849, USA, funded by Egyptian Cultural and Educational Bureau. 2015-2016: Visiting Scholar, Can Tho University, Vietnam. 2015-2017: PhD student at School of Fisheries, Aquaculture and Aquatic Sciences, Auburn University, AL, USA, 36849. 2017-Present: Lecturer of genetics at Agricultural Botany Department, Faculty of Agriculture Saba Basha, Alexandria University, Egypt. Recently, she obtained AU Invention Patent No.: 2015-017 and Newly Filed Provisional Application No.: 62/094,486 for her work. In addition, she obtained Certification of Acknowledges, outstanding performance and successful completion of Doctoral Research & Training in Aquaculture Genetics, Molecular Genetics and Genomics. January 26, 2013-March 8, 2015 from School of Fisheries, Aquaculture and Aquatic Sciences, Auburn University, AL, USA, 36849. Research interest is the genetic improvement of fish. The areas and related areas within fish genetics include selective breeding,

hybridization, gene transfer, gene mapping and genomics, and reproductive.

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## **Impact of aquaculture on biodiversity**

Samah M. Bassem

Department of Water Pollution, National Research Centre, Egypt

Recently, aquaculture or more accurately the whole fisheries sector is dominated in developing countries affecting greatly different strategies planned by the sector. In the last three decades, the fisheries sector has modified from developed country to developing country predominance. The aquaculture sector grows rapidly in Egypt and also became one of the important economic activities in the country. So, aquaculture is believed to be the prime applicable option for decreasing the gap between fish production and consumption in Egypt. As a newly emerged food producing sector; aquaculture is facing high level of public scrutiny, and from the worst effects are those on biodiversity. The major impacts on biodiversity conservation resulted from aquaculture are summarized as follows: impacts on alien species, wild populations, effluent discharge, and land use among others examined. The impact of model changes in different development plans in addition to modern market assesses had started to affect aquaculture growth. As a result, application of environmentally friendly procedures and also improvement of various practices which cause descending negative effects on biodiversity conservation are underlined. Moreover a trial is made to elucidate both



direct and indirect features of aquaculture, as being an alternative food for human needs especially the over-exploited and weak fish stocks, also other targets (medicinal components), on biodiversity conservation, usually careless entity.

### Samah M. Bassem



Samah Mohamed Bassem Khalil is associate professor at water pollution research department, environmental sciences research division, biotechnology & biodiversity conservation group, center of excellence for advanced technologies (CEAS), national research centre (NRC). Also, she is member in the Accreditation and Quality Assurance Office, NRC. Egypt. She had 19 years of experience in the field of scientific research. She participated in many local and international research projects. Her current interests include biodiversity conservation especially for the native fish and other aquatic biota. Also, she works recently in the field of probiotics; their isolation, characterization and application in aquaculture. Moreover, she is interested in marine and fresh water fish beside effect of pollution on aquatic biota. Her research corresponds to Egypt's key production and services sectors through the research conducted to decrease deleterious effects of pollution on our lives.

### Genetic stability detected on micropropagated Egyptian sugarcane cultivar (GT54-C9)

Heba Abdel-Aziz Moussa Abd-Alla

### Agriculture and Biology Research Division, National Research Centre, Egypt

Egypt Direct regeneration of sugarcane cultivar (GT54-C9) through apical meristem is a sufficient protocol to obtain uniformed disease-free plants. In this study, regeneration of shoots indicated that the highest number of shootlets, leaves and nodes were shown on MS medium with 1mg/l BAP +0.25 mg/l NAA. However, the highest length of shootlet (16.9 cm) was noticed on MS medium fortified with 2mg/l KIN + 0.25 mg/l NAA. On the other hand, roots induction revealed that the highest length of root (4.66cm) was resulted on ½ x MS contained 1mg/l IAA+ 0.5mg/l NAA. Whereas, the maximum number of roots (2.66) were recorded on ½ x MS supplemented with 1mg/l IBA+ 1mg/l NAA. Furthermore, using ISSR technique for mother leaf tissue (as a control) compared 6 subcultures of plantlets summarized that 100% of all obtained bands were monomorphic.

### Heba Abdel-Aziz Moussa Abd-Alla



Heba got her M.Sc in 2014 -2018 at genetics Department at faculty of agriculture, Ain shams University, Egypt. She works as research assistant at Botany Department at National Research Centre, Egypt.

## Evaluation of the agronomic performance and metabolome changes in two divergent selections of kale (*Brassica oleracea* var. *acephala*) for glucosinolate content under different environmental conditions.

Nora Abdelmotlb

Agricultural and Biological Division, National Research Centre, Egypt

Glucosinolates (GLs) are biologically active secondary metabolites of the Brassicaceae family. These compounds contribute to enhancing the resistance to pests and diseases and have allelopathic and anticarcinogenic effects. GLs contents have quantitative inheritance, which is regulated by complex genetic and environmental factors. Kales (*Brassica oleracea* *acephala* group) are important vegetable crops in traditional farming systems in the world. The glucosinolate content of kales is influenced by environmental factors, plant part examined and phenological stage of plant growth. This study is aimed to the evaluation of the agronomic performance and metabolomics changes occurring in two divergent selections of kale (*B. oleracea* L) for leaf glucosinolates contents (high and low sinigrin and high and low glucobrassicin) at five different environments. The result showed that, the location had a significant effect on agronomic performance for both selections. HGBS and LGBS varieties had a significant effect on agronomic performance except for plant height. The HSIN and LSIN varieties had significant

effect on the vegetative growth traits evaluated. Six glucosinolates were detected as SIN, GIB, GBS, OHGBS, NeoGBS, and MeOHGBS in two divergent selections for leaf glucosinolates contents of kale (*B. oleracea* L). The location had a significant effect on all GLs. HGBS and LGBS varieties had a significant effect on GIB, GBS, and NeoGBS. HSIN and LSIN varieties had a significant effect on GBS, GIB, and SIN. The score plot for PLS-DA exhibited an obvious separation between the divergent selections for GLs low and high (SIN) and low and high (GBS). Most of the traits influenced by environmental factors and climatic parameters before harvesting showed the highest importance. These results demonstrated that the plant under different environmental condition gave a good agronomic performance and metabolites profile in the divergent selections for GLs of kale have a clear separation between low and high (SIN) and low and high (GBS).

### Nora Abdelmotlb



Nora abdelhamied mohammed abdelmotlb is assistant researcher at vegetable department, agriculture and biological division at National Research Center in Egypt. Nora got her master degree in plant breeding program in Mediterranean Agronomic Institute of Zaragoza (IMAZ) of the international center for advanced Mediterranean agronomic studies (CIHEAM) and University of Lleida (UdL) in Spain. I worked in the effect of arbuscular mycorrhizal fungi (AMF) and *Bacillus megaterium* on green bean plants to mitigation of salt stress. She works in

abiotic and biotic stress how can make an adaptation for the plant with the abiotic and biotic stress and metabolomics.

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WORLD FORUM FOR WOMEN IN SCIENCE

# Track 4: Environment

## Track 4: Environment

### Municipal Management Economy and Solid Waste and Green

Sherien Elagroudy

Faculty of Engineering, Ain Shams University, Cairo, Egypt

Around the world, waste generation rates are rising. In 2016, the world's cities generated tons of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% from 2016 levels to 3.40 billion tons in 2050. Improper solid waste management contributes to air pollution, surface and groundwater contamination and public health challenges. MSW management is commonly the largest single budget item for communities, and this sector is often one of the largest employers as well. Thus, it is imperative to move towards a green economy in the solid waste sector by prioritizing waste avoidance, minimization and promoting the "Three Rs" (Reuse, Recycle, and Recover). In addition, moving this important sector towards responsible stewardship will contribute to the main targets of the Sustainable Development Goals (SDGs). This study provides a global snapshot of today's MSW management practices. In addition to providing details of the current situation, credible estimates are made for the potential state of SWM in 2025. This study describes the specifics of

SWM in an economic context, focusing on: (1) countries with advanced economies, especially G8 countries, (2) countries in transition and with emerging economies (BRICS) and (3) countries with developing economies. It aims at motivating and assisting governments and businesses in making a transition to a green economy in the waste sector. Beyond appraising the current state of solid waste management, this study ultimately proposes alternative policies and remedial action to achieve a green economy in SWM. This study has been generously funded by The InterAcademy Partnership (IAP), the Global Young Academy (GYA) and the German National Academy of Sciences Leopoldina.

#### Sherien Elagroudy



Sherien Elagroudy, is an Associate Professor of Environmental Engineering at Ain Shams University in Egypt and the founding director of the first Solid

Waste Management Center of Excellence in the country. In her Ph.D. studies at Ryerson University, Sherien modeled the settlement of bioreactor landfills and then build a field-scale prototype of that novel landfill in Cairo. Her new bioreactor avoided methane emissions into air and leaching of wastewater into Cairo's water supply. She continued her research in novel solid waste treatment systems that could mitigate the environmental impact of waste through post-doctoral research at Yale. Since then, Sherien has spent more than 16 years in research and practical projects to design and implement real-world solid waste

management strategies, supervising both post-graduate students and junior engineers to train the next generation of academic and industrial leaders in the field. The impact of Sherien work has also been recognized in awarding her the Next Einstein Forum Fellow in 2016, the L’Oreal UNESCO Fellowship for Women in Science in 2013 and has also been honored as young scientist at the World Economic Forum in China in 2013. She was named a fellow of the Global Young Academy as well as a steering committee member of Egypt Young Academy of Science. Consistent with Sherien passion to do more than academic work, she has long been a solid waste expert at Chemonics Egypt. She led the team at Chemonics in setting the solid waste management strategy for several countries. Sherien has published several journal papers and book chapters. She is currently engaged in several research grants of more than \$3.5M in the fields of solid waste management, biochemical waste treatment technologies and waste to energy.

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### **Application of Livelihood Vulnerability Index in assessing climate vulnerability: A case of smallholder horticultural producers in Ghana**

Portia Adade Williams

University of Cape Town, South Africa

Agriculture in Africa is vulnerable to changing climate and factors contributing to climate vulnerability are distinct

between places, sectors and communities. Although numerous potential adaptation options have been identified, African countries including Ghana have not realized their full potential in climate adaptation. With limited knowledge guiding specific sector vulnerability assessments, applicability of the Livelihood Vulnerability Index to understand vulnerability among smallholder horticultural farming households to impacts of climate variability in two municipalities were explored in Ghana. A total of 480 households engaged in horticultural crop production were surveyed in Keta and Nsawam municipalities. Using composite index, data collected were aggregated and compared. Smallholder horticultural farmers in Keta were more vulnerable in relation to exposure and sensitivity to climate variability while smallholders in Nsawam were more vulnerable in terms of capacity to adapt to climate variability. To enhance future planning and policy discussions, identification and assessment of adaptation options to manage climate variability is recommended. Inclusion of appraisal method that provides analysis on gains and losses arising from investment in adaptation options as decision support for enhancing climate adaptation is also recommended for future vulnerability assessments within local and national levels.

### Portia Adade Williams



Mrs. Portia Adade Williams is a PhD candidate at the Environmental and Geographical Science Department, University of Cape Town (UCT), South Africa. Mrs. Williams is also a Research Officer with the Science and Technology Policy Research Institute (STEPRI) of the Council for Scientific and Industrial Research (CSIR) in Ghana for the past five years. She had her MSc in Economics and Management and a BSc in Agricultural Science from the Blekinge Institute of Technology, Sweden and Kwame Nkrumah University of Science and Technology (KNUST) Ghana, respectively. Mrs. Williams is a fellow of Organization for Women in Science for the Developing World (OWSD) PhD Training Fellowship Programme at UCT and is presently a member of the OWSD. She was a fellow of DFID's Climate Impact Research Capacity and Leadership Enhancement (CIRCLE) Programme in Sub Saharan Africa (Cohort 2). Her research interests are into climate, socio economic and innovation studies and research areas are agricultural production systems' impacts, vulnerability and adaption to climate variability/change. Mrs. Williams has participated and/or presented in over ten international conferences/workshops/training programmes globally with about ten peer reviewed publications to her credit.

### Sustainability of the Water Resources Management

Alaa El-Sadek

Water Resources Management, Arabian Gulf University, Bahrain

Partial rootzone drying (PRD) is the creation of simultaneous wet and dry (or drying) areas within the root zone. Only part of the root zone is irrigated and kept moist at any one time. This new irrigation strategy allows the exploitation of drought-induced abscisic acid (ABA) based root-to-root signaling system to water saving. In this research, the PRD technique is examined and simulated for wheat and maize crops in the Mashtul Pilot Area (MPA), Egypt using Saltmed model. The technique causes the stimulation of physiological responses which are normally associated with water stress and this result in a significant reduction in water use through the production of chemical signals in drying roots. The results confirmed an increase in irrigation water use efficiency using PRD comparing with conventional flood irrigation. The research highly recommends applying the PRD method in new reclaimed areas in Egypt to save water; improve crop quality and achieve the sustainability of water resources in the agricultural sector.

### Alaa El-Sadek



Prof. Alaa El-Sadek holds the academic position of Professor of Water Resources Management at the National Water Research Center, Egypt and at the Arabian Gulf University, Bahrain. He

obtained his PhD degree in 2001 in the field of surface water modeling from Catholic University of Leuven, Belgium. He held a postdoctoral position at Catholic University of Leuven, where he worked on applying his developed models to water management and validating it using the most recent data from three catchments in Belgium and Egypt. He has published more than 120 papers in peer-reviewed journals, conferences, and seminars. In 2002, he received the Award of UNESCO-MAB young scientists and in 2004, he received the Encouragement State Prize in Engineering from Academy of Scientific Research and Technology, Egypt. Since 2006, Prof. El-Sadek has been the president of the Arab World Academy of Young Scientists. His research interests include but are not limited to Water Resources Management; Virtual Water; Project Management and Environmental Impact Assessment. He serves as a consultant for many international and regional organizations.

## Desalination by using Nanocellulose Extracted from Solid Agricultural Wastes

Amira Salah Mahmoud

Institute of Graduate Studies and Research,  
Alexandria University, Egypt

Cellulose is an abundant natural material, low environmental, health and safety risks and Low cost. Cellulose was extracted from Egyptian cotton stalks and rice straw and convert it to Nanocellulose. The Nanocellulose acetate was investigated by

FTIR, HNMR, SEM, XRD and Gel electrophoresis. It was found that size of Nanocellulose about 22 nm for rice straw and 28 nm for cotton stalks. The XRD results indicates that Nanocellulose enhance crystallinity while mechanical test proved that Nano cellulose acetate increase mechanical properties comparing with cellulose acetate membrane. The surface hydrophilicity of Nanocellulose acetate membranes were enhanced as the contact angle reached 40.50 in case of Nano rice cellulose acetate (NRCA), 35.80 in case of Nano cotton cellulose acetate (NCCA). Addition of polyethylene glycol to nano CA-RO membrane increase hydrophilicity as the contact angle reached 23.90 values of water flux and salt rejection for CA-RO membrane tested in 10,000 ppm NaCl, the water flux was 1.1 L/m<sup>2</sup>h and salt rejection 94%, while the water flux and salt rejection of Nanocellulose rice straw membrane (NRCA) and for Nanocellulose acetate extracted from cotton stalks (NCCA) at 4 bar. Were 99.3% and 41 for RNCA and 98.4% 20 for NCCA respectively. Nanocellulose acetate membrane has been applied to reverse osmosis for desalination due to chlorine tolerance and biofouling resistance. This study could contribute to develop a Nanocellulose acetate RO membrane for desalination application.

### Amira Salah Mahmoud



Dr. Amira Salah Mahmoud had PhD degree in Environmental Studies titled (A study on water treatment by using



from solid agricultural wastes), Environmental Studies Department, Institute of Graduate Studies and Researches (IGSR), Alex, Egypt. (2018). She has master degree in environmental studies titled (Application of Nanotechnology for Degradation of Organic Pollutants in Industrial Waste Water using Photocatalytic Materials), environmental studies department, Institute of Graduate Studies and Researches (IGSR), Alex, Egypt. (2013). She got bioanalytical Chemistry Diploma from Alexandria university, Egypt in 2007. She got B.Sc. from department of Chemistry and Oceanography, Faculty of Science, Alexandria University in 2004.

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### **Mobility and Risk Assessment of Heavy Metals by Sequential Extraction in Coastal Sediment South Mediterranean Sea, Egypt**

Maha Ahmed Mohamed Abdallah and Adel Amer Mohamed

Marine Pollution lab, National Institute of Oceanography & Fisheries, Alexandria, Egypt

The chemical speciation of metals (Cd, Zn, Cu and Fe) for coastal marine sediment samples collected from ten locations in the Western Harbour (main harbour) in Egypt and has been studied in two surveys were determined using the 4-step sequential extraction procedure. A sequential extraction technique was used to quantify exchangeable, oxides (reducible), organic/sulphidic and acid soluble (residual) fraction. It was noticed that Cd and Zn have the highest capability

to be released from the sediment, more mobile and bio-available, by the simple ion exchange mechanism in the W.H than Cu and Fe which were present at higher percentages in the acid-soluble fraction, meaning that these two metals were strongly bound to the sediments. Considering the percentage of metals extracted in the most labile fractions (F1 + F2 +F3), the order of mobility (from most to least bioavailable) was: Cd (94%)>Zn (64%)> Cu (22%) >Fe (3.5%). Risk assessment code (RAC) analysis indicated that, the sediments show no risk for Fe and a low risk for Cu and low to medium risk for Zn and medium to high risk for Cd with RAC values greater than 11% and 30% respectively, indicating a substantial risk of metal mobilization from sediments across the entire study region.

### **Maha Ahmed Mohamed Abdallah**



Dr. Maha is the head of Marine Pollution Department, Environmental Consultant in the Egyptian Ministry of Environment, Professor of Marine Pollution and Environmental Chemistry, National Institute of Oceanography & Fisheries, Mediterranean Sea Branch, Alexandria, Egypt. Her current activities are related to the field of monitoring and assessing marine pollutants especially toxic metals and organic pollutants in water and sediment, i.e. using the sequential chemical fractionation of trace elements and heavy metals in the surface sediment to identify the picture that there is a component of the mineral deposits and

the potential to address, and also enrich the accumulation of heavy metals in sediments. In addition, she is interested in the preparation of nano particles from natural marine materials and using them in removal of some pollutants from industrial wastes and contaminated drinking water

## **Sustainable Valorization of Different Agro-Industrial Wastes towards Better Environment**

Nour Shafik El-Gendy

Egyptian Petroleum Research Institute (EPRI),  
Cairo, Egypt

Millions tons of agro-industrial wastes are produced annually all over the world. These wastes are not economically reused, create air, soil and water pollution. That has negative impact on human health, tourism, economy and environment. My talk briefly summarized how valorization of agro-industrial wastes can be applied to solve many of pollution, waste management, energy, climate change ... etc. problems. For example; (1) bioremediation of different oil polluted environments and my team work successful efforts in real field case studies. (2) bio-upgrading of petroleum and its fractions throughout the application of biodesulfurization, bidenitrogenation ... etc. (3) biosorption and wastewater treatment. (4) recycling and valorization of different kinds of agro-industrial wastes

to produce valuable products; e.g. nano-materials, biosurfactants, biocides, catalysts to be applied in biodiesel production, corrosion inhibitors, green-catalyst with high photo-catalytic degradation properties, wastewater treatment ... etc. (5) production of different valuable industrial products from algae, which have many applications in industries of food, cosmetics, pharmaceuticals, food supplements, animal feed ... etc. (6) production of different kinds of biofuels as complementary and/or alternative to ptero-fuels; biodiesel from waste cooking oil and micro-algae and bioethanol from macro-algae, different lingo-cellulosic wastes and sugarcane and sugar beet molasses.

### **Nour El-Gendy**



Nour Sh. El-Gendy is a Professor of Petroleum and Environmental Biotechnology and acting head of Process Design & Development Department and former head manager of Petroleum Biotechnology Lab, Egyptian Petroleum Research Institute. Vice coordinator of the Scientific Research Committee and member in Rural Woman Committee, National Council for Women (NCW) of Egypt. She is member in the Egyptian Young Academy of Sciences (EYAS). El-Gendy is expert in the field of biotreatment of environmental pollution, wastewater treatment, biofuel, petroleum upgrading, green chemistry, nanobiotechnology, recycling and valorization of wastes and biocorrosion. She authored 4 books, 4 chapters and 107

manuscripts in the fields of the environmental pollution, bioremediation, biosorption, biofuels, microbial-corrosion, green chemistry, wastewater treatment, biodesulfurization, biodenitrogenation and nano-bio-technology and its applications in petroleum industry, treatment of environmental pollution and biofuels. She is an editor for 38 international journals, reviewer for 79 international journals and supervisor for 26 MSc and PhD theses. She participated in 40 international workshops, training courses, and 61 international conferences. She is a member in many international associations concerned with petroleum, biotechnology and environmental health and sciences. She has international collaboration with different foreign universities. She has also teaching experience (Chemical Engineering Department – Faculty of Engineering - The British University in Egypt BUE, Faculty of Biotechnology - Modern Sciences and Arts, MSA University, Faculty of Science - Monufia University, Chemical Engineering Department - Faculty of Engineering - Cairo University and Biotechnology Program - Faculty of Science, Cairo University). El-Gendy biography is recorded in Who's Who in Science and Engineering.

## Effectiveness of Eco Friendly Adsorbents for Oil Removal

Ola Abdelwahab<sup>1</sup>, Samir M. Nasr, Walaa M. Thabet

National Institute of Oceanography and Fisheries, Alexandria, Egypt

The use of natural adsorbents to clean up oil spill in an eco-friendly and cost effective way is promising, and more attention should be paid to this prospect. Palm fibers, PFS, were used as natural sorbent material for oil spill removal. The present study examines the adsorption efficiency and capacity of raw and modified fibers for three types of oil; crude oil, diesel oil and vegetable oil. The results revealed that the efficiency of fibers to remove different types of oil from artificial saline water was related to sorption time and the system conditions such as oil film thickness, particle size, sorbent dosage, weathering and temperature. The results showed high sorption efficiency and capacity of palm fibers for different kinds of oil. PFS are very promising fibers because of all advantages of agricultural wastes plus the high resistance of that fibers which appears obviously in the present study.

### Walaa M. Thabet



Dr Walaa is researcher and lecturer at Pollution lab, Marine Environment division, National Institute of Oceanography and Fisheries in Egypt. She got M.Sc. in chemical oceanography and Ph.D. in environmental studies. Her master thesis was about studying the water quality and Ph.D. about marine pollution, water treatment and using of eco-friendly methods for treatment. She got courses of LSS Green Belt and ISO 17025, ISO 9001, PMP and environmental management where she will be a certified lead environmental audit 14001 in 2019. She is seeking to work in the field of

environmental management after she earned two scholarships about ocean management (Malta University and International Ocean Institute) and blue growth (EMUNI university Slovenia).

## Magnesium dioxide modified by Calcium Carbonate Derived from Eggshell Waste for Effective Photodegradation of Indigo Carmine Dye

Radwa A. El-Salamony, Sherif A. Younis

Egyptian Petroleum Research Institute, Cairo, Egypt

The field of catalysis has seen a recent reappearance of interest in the design and development of catalytic materials derived from low cost components, with a view to improving the overall sustainability of catalytic processes. Raw eggshells turned out as a good source of calcite phase by calcination at 600 °C. A series of CaCO<sub>3</sub>-doped MgO nano-composites (x Ca-MgO) with different Ca-molar ratios were prepared by mechano-mixing method. The as-synthesized nano-catalysts were characterized through N<sub>2</sub>-adsorption-desorption, X-ray diffraction, transmission electron microscope, and fourier transform infrared. Photo-catalytic degradation of 50 ppm of Indigo Carmine Dye (IC) under 8-W ultraviolet C irradiation was examined, and these results compared with that of adsorption studies. 100 % removal was achieved in 120 min by using 80Ca-MgO nano-composite. The kinetic study revealed that

photo-degradation of IC follows pseudo-first order reaction mechanism.

### Radwa A. El-Salamony



Radwa A. El-Salamony received the BSc degree in chemistry from the faculty of science, Ain Shams University, Egypt, in 1998, the MSc. and Ph.D. degrees in physical chemistry on "Reforming of Natural Gas by Carbon dioxide to Produce Synthesis Gas" and "Photocatalytic Degradation of Organic Pollutants Containing Various Functionalities in Aqueous Solution Using Transition Metal Oxides as Photo-catalysts" from Ain Shams University, Egypt, in 2005 and 2010, respectively. Since December 2015, she was associate professor. She is specialist in Preparation, Characterization of Nano-catalysts and Application in Photo-catalysis and Energy Production. Her current research interests focused on modification of many catalytic composite systems based on agriculture waste like RSA or SCB in removal of dye, phenol compounds and heavy metals from wastewater, preparation and utilization of ceria based catalysts for hydrogen production through steam reforming of ethanol, dry reforming of methane, Methane production via CO<sub>2</sub> hydrogenation and preparation of nanofluids for cooling. She has experience in designing fixed bed flow reactors. She is good expert in operation of online Quantitative Gas Analyser (QGA, HIDEN) in gaseous reaction and expert in detection and separation of natural gas components. She is member in "Development of Novel Catalysts and Membrane Reactors for the Dry

Reforming of Natural Gas Using Carbon Dioxide" project, (STDF). She acts as a reviewer in many international journals.

### Adsorption isotherms and kinetic studies for the defluoridation from aqueous solution using eco-friendly raw marine green algae, *Ulva lactuca*

Ghada .F .El-Said, Manal .M.El-Sadaawy, Mohamed .A .Aly-Eldeen

National Institute of Oceanography and Fisheries, Alexandria, Egypt

The defluoridation from aquatic medium by raw marine algae, *Ulva lactuca*, was investigated. The element components and adsorbent's properties were determined. The influence of pH, contact period, and *Ulva* sp. weight on the defluoridation was achieved. The complete defluoridation of 10 mg F<sup>-</sup>/l solution was obtained within 10 min at definite pHs. Fourteen adsorption isotherms and four kinetic models (pseudo-first order and pseudo-second order, Elovich, and intraparticle diffusivity) were studied. The most adequate model was performed by using five error functions. The application of chi-squared test indicated that the nonlinear isotherm models (two and three parameters) were more applicable than the linear ones. The adsorption kinetic proceeded by pseudo-first-order model. The adsorption mechanism was very complex; thus, the solute distribution step was not the only dominant one during the process. The adsorption seemed to be a

physical negative binding cooperative type with activation energy and free energy of 3.16 and - 1.672 kJ/mol, respectively. Thus, raw marine algae, *Ulva lactuca*, can be used as an adsorbent in solving the fluoridation problem in aquatic mediums throughout the world due to their fast procedure, high efficiency, low effort, and high economic value.

### Manal .M.El-Sadaawy



Dr. Manal is associate professor at pollution lab, marine environment division, national institute of oceanography and fisheries in Egypt. She has

experience in determination of heavy metals in sediment, biota and algae. She is expert in determination of hydrocarbons and pesticides in sediment and biota & extraction of cellulose from agriculture waste & acetylation of cellulose & wastewater treatment & heavy metals and dyes abatement from waste water using electrocoagulation-floatation technique & desalination using different types of liquid membrane technique and environmental aspects. She has 24 scientific papers in International journals

### Bioremediation of Diesel Contaminated Water Using Indigenous Hydrocarbon Degrading Bacteria

Tudararo-AheroboLaurelta, Iritare Mudiaga, Ogeleka Doris Fovwe

Department of Environmental Management and Toxicology, Federal University of

### Petroleum Resources, Effurun, Delta State, Nigeria

Petroleum-based refined products such as diesel, kerosene, petrol are the major source of energy for industry and daily life. Accidental spills and leakages occur regularly during the refining, transport, and storage of petroleum products. Bioremediation of diesel contaminated water was studied using indigenous degrading bacteria isolated from hydrocarbon contaminated soils obtained from automobile mechanic workshops located at Effurun, Delta State. Four (4) bacteria isolates with high diesel biodegradability potential assessed by turbidity measurement were used for the diesel bioremediation study. The bacteria isolates used for the test were identified as, *Acetobacter* sp, *Staphylococcus* sp, *Marinococcus* sp, and *Acinetobacter* sp. The test microcosms were incubated for two weeks at  $28 \pm 2$  °C. Oil & grease concentrations, bacteria count, pH and turbidity were monitored weekly to assess the biodegradation of the diesel. At the end of the test duration, *Acetobacter* sp. recorded the highest percentage diesel biodegradation (77.57%) for the 5% diesel experimental set up. Similarly, *Acinetobacter* sp. recorded the highest percentage diesel biodegradation (81.34%) for the 10% experimental set up. Both residual diesel concentrations obtained are below the DPR recommended limit of 10 mg/L for oil & grease in inland waters. Thus, *Acetobacter* sp. and *Acinetobacter* sp. could be used to effectively bioaugment the bioremediation process of diesel

contaminated waters within a short period of time.

### Tudararo-Aherobo Laureta



She works at department of Environmental Management and Toxicology, Federal University of Petroleum Resources, Delta State, Nigeria. She is senior lecturer, with specialization in Environmental Microbiology and Public Health Microbiology. Research areas covers bioremediation of hydrocarbon contaminated sites, microbial induced corrosion and bioenergy production from microbial biomass and anaerobic waste degradation.

### Removal of cadmium (II) from water by low cost activated carbon prepared from Stevia plant

Engy Elhaddad

National institute of Oceanography and Fisheries, Egypt

The present work describes the biosorption potential of low cost and easily available Stevia plant for the adsorptive removal of cadmium (II) metal. Stevia plant was treated chemically with ascorbic acid and physical treatment by increasing temperature to 500 °C. The adsorption behavior of Stevia plant has

been investigated as a function of appropriate equilibrium time, adsorbent dose, temperature, and pH in a batch system. Studies showed the modified peel is adsorbing more than non-modified. The pH of aqueous solutions effects the heavy metals removal of cadmium. The maximum value of removal appeared at pH 5. The isothermal data of Cd (II) sorption conformed well to the Langmuir model. The equilibrium of removal of heavy metals was reached within 60 min. The removal process could be described by the pseudo-second-order kinetic model. In conclusion the activated carbon prepared from Stevia plant is better than Stevia plant only.

#### Engy Elhaddad



Dr. Engy is associate professor for environmental chemistry at National Institute of Oceanography and Fisheries. She received both of her B.Sc (2001) (excellent with honor), Master (2005) from Al Azhar university and her Ph.D. (2012) degrees from Darmstadt Germany. Also, she obtained postdoctoral fellowship at Oldenburg, Germany (2015) and DAAD fellowship at the University of Oldenburg Germany (2017). She is interested in Nanotechnology, Environmental chemistry, hydrochemistry and photocatalysis.

#### Fluctuations of phytoplankton community structure of Aswan High Dam (Nasser) Lake, Egypt.

Shymaa S. Zaher and Walid Aly  
National Institute of Oceanography and Fisheries, Cairo, Egypt

Lake Nasser is the main source (reservoir) of fresh water for drinking and irrigation in Egypt. This study was carried out to acquire better understanding of the present status of phytoplankton distribution along the main channel of Lake Nasser under the present flood regime and before the constriction of the Grand Ethiopian Renaissance Dam (GERD). Samples were collected from forty sites representing different lake sectors along the main channel of Lake Nasser during 2016-2017. A total of ninety species were recorded belonging to five different classes dominated by Cyanophyceae, Bacillariophyceae, and Chlorophyceae, while Euglenophyceae, and Dinophyceae were rare. Cyanophyceae was the most frequent phytoplankton class, and *Microcystis aeruginosa* was its most abundant species. *Aulacoseira granulata*, *Cyclotella meneghiniana*, *C. operculata*, *C. ocellata*, *C. glomerata*, *C. kutzingiana* and *C. bodanica* were the most dominant diatoms. Also, *Chlorella vulgaris* and *Chlorella pyrenoidosa* were the most common green algae. Generally, total phytoplankton number was higher post the flood period than before it. The results of this study indicated that the most important factors affecting phytoplankton species distribution before and after the flood season are temperature, ammonium, nitrite, nitrate and phosphate. Lake morphometry, level of water oscillation, zooplankton, and fisheries may be also affected by changing of flood regime of the Lake, so further studies on the lake ecosystem are recommended.

### Shymaa Sabry Zaher



Dr. Shymaa is a lecturer of marine toxicology, Fresh water aquatic habitat Division, National Institute of Oceanography and Fisheries Branch: Inland water. Her research interests include the phyecology to understand the effect of phytoplankton as the base of the aquatic food chain. Her researches include physical, chemical and biological parameters in water in addition to heavy metals in both of water and sediment, isolation and purification of algae from water. She studied the toxic algae in aquatic habitats which included field and bioassay studies. She got BA in microbiology in 2001 and Ph.D. in microbiology in 2012 from Ain-Shams University. She had M. Sc. Degree in microbiology (2006), Al-Azhar University. She is interested in phytoplankton distribution and its relation to industrial and raw-sewage wastes discharging in Rosetta Branch of River Nile, Egypt.

### Sustainable Coloured Decorative Cementitious Renders for Building Façade by Using Industrial Wastes Materials

Abdelfattah Mahmoud Abdelfattah Ghareib

The solid wastes are one of the environmental problems not only in Egypt but also in the whole world, so the all organizations in different countries should do an important role to overcome this problem by some effort has been done by them like some laws or instruction or some environmental projects for recycling the wastes. The main objective of this

paper to create colored cementitious render by using wastes of much industrial manufacturing like construction manufacturing by using fine domination wastes also marble dust from many marble factories and electrostatic powder waste. Two parameters (color stability and water resistance performance) are studied to characterize the mechanical properties of the render. The findings show the surface features of outer façade surfaces is suitable and give a good appearance so this may help to overcome many types of wastes to be useful in the future.

### Abdelfattah Mahmoud



Dr. Abdelfattah Mahmoud is a specialist in quality and environmental management systems like ISO 9001 ISO 14001 ISO 17025 and OHSAS 18001. He received his first degree in chemistry from Ain Shams university- Egypt, 2003. He then won his first master degree in Year 2011 from The Arab Academy for Science and Technology and Maritime Transport and the second one from Ain Shams university in November 2015. Finally he got his PhD degree from Damietta University in 2019. His expertise is related to quality, environmental management, training, safety and calibration.



## Myco-gold nanoparticle synthesis by *Aspergillus flavus*: Characterization, optimization and cytotoxic activity

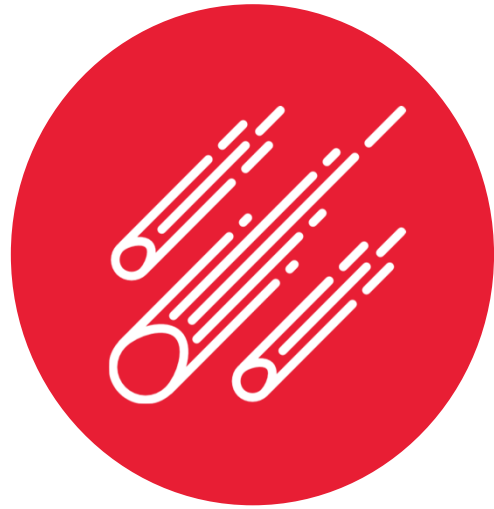
Shimaa Ragab Hamed Ragab  
National Research Centre, Egypt

Myco-synthesis of stable gold nanoparticles (GNP) using *Aspergillus flavus* filtrate was obtained. Myco-synthesized GNP were characterized by UV-Vis spectroscopy, high resolution transmission electron microscopy (HRTEM), dynamic light scattering (DLS) and FTIR. GNP showed red violet colour with a peak at about 530-540nm as detected by UV-Vis spectroscopy. HRTEM showed spherical, hexagonal, rectangular and anisotropic crystalline nanoparticles with 10-50 nm in size. The size was confirmed by DLS and it was  $35.5 \pm 15$ . FTIR analyses of synthesized GNP showed presence of amide and carbonyl functional groups which depicts the presence of peptides that involved in the synthesis and stability of GNP. Nitrate reductase activity was found to be  $0.83 \mu\text{mole}/\text{min}/\text{ml}$  of filtrate. The optimum conditions for the synthesis of GNP were 10% filtrate, one mM  $\text{HAuCl}_4$  in aqueous solution for 30 min incubation at  $30^\circ\text{C}$  under static and illumination conditions. GNP synthesized by *A. flavus* filtrate showed a potent cytotoxic effect on both breast and lung carcinoma human cell lines. However, they were none toxic to normal human cells. This study used a simple, clean, quick and inexpensive synthesis approach for GNP. The synthesized GNP showed anticancer activity and they can be used in biomedical applications.

## Shimaa Ragab Hamed Ragab



Dr. Shimaa Ragab is a researcher of Microbial Biotechnology at the National Research Centre in Egypt. She got the Bachelor of Sciences, department of Microbiology and Chemistry, from Zagazig University, Egypt. Following that, she had M. Sc In Microbiology from Assuit University that was about "Production of Some Compounds of Therapeutic Effect by Fungi from agricultural and Industrial by-products", then she had Ph.D in microbiology from Benha university, Egypt which was titled as "Biochemical Studies on some Bioactive Compounds from some Fungi". She worked as assistant researcher in Fungal Physiology Lab., Botany department, Faculty of Science, Assuit University in the period from 2003 to 2006 and as Researcher of Microbial Biotechnology, Microbial Biotechnology Department, Genetic Engineering and Biotechnology Division, National Research Centre (NRC) from 2008 till present. She is reviewer for Springer international publisher and science domain international publisher.



3<sup>RD</sup> INTERNATIONAL CONFERENCE FOR WOMEN IN SCIENCE NETWORK

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## Track 5: Recent Advances

## Track 5: Recent Advances

### Mansourasaurus - A Story from the Land of Pharaohs and Dinosaurs

Hesham Sallam

Department of Geology, Faculty of Science,  
Mansoura University, Egypt

Despite decades of exploration and numerous paleobiogeographic scenarios put forth to characterize Gondwanan and African faunas, the African Late Cretaceous fossil record remains largely unknown and hinders adequate testing of these hypotheses. Here, we report a very rare and by far the most complete nonavian dinosaur from the post-Cenomanian Late Cretaceous (Campanian) of the entire continent of Africa. The close phylogenetic relationship of the new Egyptian dinosaur with other Late Cretaceous Laurasian titanosaurs provides the first unambiguous evidence that clearly demonstrates affinities had indeed existed between northern African and Eurasian faunas, revealing a previously suspected but largely untested biogeographic province.

2010 at the University of Oxford (UK). In addition, he was a visiting scholar at Stony Brook University, Ohio University, Denver Museum of Nature & Science and Duke University, USA for a year (2014/2017). Over the course of last 10 years, he has been conducting paleontological research on the vertebrate fossils of Afro-Arabia. The work resulted in a series of publications in high profile journals such as Proceedings of the National Academy of Sciences (PNAS), Nature Ecology & Evolution, Nature Communications, PLoS ONE, PeerJ, Journal of Vertebrate Paleontology, and Palaeontology. His important contribution to Egyptian paleontology is that he founded the Mansoura University Vertebrate Paleontology (MUVP), the only high-level vertebrate paleontology research unit in the Middle East, a combined research, outreach, and conservation endeavor based out of Mansoura University, Egypt. MUVP's most significant accomplishment was the discovery, recovery, and description of the large sauropod dinosaur Mansourasaurus, which was found in the Dakhla Oasis area of Egypt. This new species revealed previously unappreciated biotic links between the Afro-Arabian and Eurasian landmasses during the close of the Cretaceous period, around 73 million years ago.

#### Hesham Sallam



Dr. Hesham received his bachelor degree (1997) from the Department of Geology at Mansoura University in Egypt then he completed his Ph.D. in

## Meteorites and Impact Craters in Morocco and Arabic Countries: An Overview

Hasnaa Chennaoui Aoudjehane

Faculty of Science, Hassan II University of Casablanca, Morocco

**Meteorites:** Arabic countries are very rich in meteorite finds. Collection of meteorites is essentially done in hot and cold deserts. Most of the Arabic countries contain large desert areas, explaining why they are a very good place for searching meteorites. Those meteorites are quasi totally exported out of their countries of find, by dealers, collectors or foreign scientists. All classes of meteorites are found in the hot deserts; a lot of them are rare and potentially very important for the scientific research in particular due to their origin: most of martian meteorites, lunar meteorite, angrites and other rare types are from the hot deserts. All meteorite falls since 2004: “Benguerir”, “Tamdakht”, “Tirhert”, “Tinajdad”, “Sidi Ali Ou Azza”, “Izarzar”) has been classified and submitted to the Nomenclature Committee of the Meteoritical Society by our team including the exceptional fifth Martian meteorite fall in Morocco “Tissint”. Many valuable papers have been published on these falls allowing Moroccan researchers to comfort their position on this topic. A similar effort was done with meteorite finds in Morocco such as “Al Haggounia”, “Anoual”, “Bou Azarif”, “Agoudal”... Most other finds from the countries surrounding Sahara (Morocco, Algeria, Tunisia, Mauritania Mali, Tchad, Niger...) are called by a serial name (North West Africa) followed by a

number: NWA xxx . The lack of locality name means that we don’t know the exact origin of the sample, thus we loose important scientific and patrimony information. In Lybia and Oman, there are large meteorites strewnfields with known geographic coordinates and a serial name plus a number like Dar El Ghani (DAG xxx), Hamada Al Hamra (HAH xxx), Shisr xxx, ... In Egypte, there is one of the most famous martian meteorites falls, Nakhla, as well as the most ancient meteoritic iron, found in the King Tut treasure. In Saudi Arabia, there is a recent impact meteorite crater: the Wabar crater, while the black stone in the Kaba Al Mounaouara is said to be possibly a meteorite. Despite of this richness, Arabic countries does not have laboratories devoted to research on meteorites, they doesn’t have museums for the preservation of this patrimony that is lost quickly. Indeed, most meteorites exported from Sahara are sold to private collectors with no benefits to Science and to the countries. It’s important to have a smart regulation as well as research centres and museums have to be created in Arabic countries.

### Hasnaa Chennaoui Aoudjehane



Dr. Hasnaa is professor at the Hassan II University of Casablanca, Faculty of Sciences Ain Chock, Director of GAIA Laboratory. She got her PhD on Noble gases geochemistry in Pierre et Marie Curie Paris 6 France in 1992 then a Doctorat d’état on Meteoritics and Planetary Sciences in 2007. Her research focuses on Meteorites classification and the

constrain the intensity of the shock on parent bodies of meteorites. She introduced and promoted Meteoritics research in Morocco since 2000, she is author of many research papers including one publication on Tissint (martian meteorite fall in Morocco) in the prestigious magazine "Science" (Chennaoui Aoudjehane et al., 2012). She organised many meeting in Morocco as well as the 77<sup>th</sup> Meteoritical Society meeting on November 2014 in Casablanca. She is currently member of the Nomenclature committee and past member of the council of the Meteoritical Society. She is actively involved in the promotion of planetary sciences in the Arab world and Africa.

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3<sup>RD</sup> INTERNATIONAL CONFERENCE FOR WOMEN IN SCIENCE NETWORK

WORLD FORUM FOR WOMEN IN SCIENCE

## Track 6: Science Diplomacy – Gender – SDGs

## Track 6: Science Diplomacy - Gender Issues - Sustainable Development

### “United Nations Sustainable Development Goals (SDGs), Science Diplomacy, Science-Policy Interface and Future Careers of Young Scientists”

Tateo Arimoto

National Graduate Institute for Policy Studies, Tokyo, Japan

Since the beginning of the 21st century, globalization has spread to every sector and corner of the globe. We live in a fast-paced and interconnected world with increasing complexity and uncertainty. We are standing at the crossroad of great transformation of modern society and science, and facing local, national and global challenges. In 2015, United Nations unanimously agreed Sustainable Development Goals – 2030 Agenda”, and expected global science community can play an important role for achieving 17 goals of SDGs: hunger, poverty, health, gender, inequality, education, economy, environment, cities & habitats, energy, production & consumption, climate change, ocean, land and global partnership. SDGs are common values and visions of the 21st century and giving great opportunities for science community to transform its values and eco-system for people and earth. Science and technology policy is expanding rapidly its horizon from “Policy for Science” to “Science for Policy” and “Science

Diplomacy” beyond the boundaries. I will show you mega-trend and changing landscape of society and S&T, and then discuss about how to build up your capacity and future career in the changing world.

#### Tateo Arimoto



Dr. Tateo is deputy director, STI Policy Research Center and Visiting Professor, National Graduate Institute for Policy Studies (GRIPS),

Principal Fellow, Japan Science and Technology Agency (JST) and Vice Director General, International Institute for Advanced Studies. He served as Director General of Science & Technology Policy Bureau of the Ministry of Education and Science and held the position of Executive Research Fellow at the Economic and Social Research Institute of the Cabinet office. He has played an active role in public policy making and implementation in the area of science, technology and innovation in Japan and is a major promoter of science of STI policy with multidisciplinary approach. He has been a co-chair person of the OECD study projects on “Scientific advice”, “Research funding system” and “Trans disciplinary research”. He is a member of the program committee of the International Network for Government Science Advice (INGSA), and the special committee of Science Diplomacy at the Ministry of Foreign Affairs of Japan. He has published several books and

numerous papers and given many invited lectures at international conferences such as OECD, INGSA, APEC, EU, WSF, STS Forum and AAAS; “Rebuilding Public Trust in Science for Policy Making”, Science, vol.337, 2012, “Building the Foundations for Scientific Advice in the International Context”, Science and Diplomacy, vol.3 No.3, 2014, “UNESCO Science Report – Towards 2030”, Japan Chapter”, November 2015, “Five years after Fukushima: scientific advice in Japan”, Palgrave Communications 2016, “Science in a changing world”, Physics World, Institute of Physics, UK, 2018.

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## Science Diplomacy and the Role of DAAD: Meaning, Challenges and Internationalization Strategies

Isabell Mering

DAAD Regional Office, Cairo, Egypt

Nowadays, Science Diplomacy is emerging ever more clearly as a soft diplomacy tool. In fact, Science Diplomacy is a fluid concept with multi-layered positive results. It is considered to act as a bridge between higher education and research and international relations. The presentation will give an overview with regard to the possible dimensions of the topic; at the same time, the current special interest in the field shall be examined: why Science Diplomacy is experiencing a revival in our days. When it comes e.g. to international partnerships, academic and scientific exchange, global challenges and political ties between

nations, soft diplomacy tools are more and more taken into consideration by various decision makers. The DAAD as an organization has also stressed the importance of Science Diplomacy as a tool of external politics. DAAD’s mission – change by exchange – is closely linked to science diplomacy. In fact, facilitating and supporting scientific relations is an inherent part of DAAD’s daily work. Selected examples are supposed to show how DAAD is contributing to the various dimensions of Science Diplomacy.

### Isabell Mering



Ms. Isabell Mering is the director of the DAAD Cairo office since the 1st of October 2018. Ms. Mering studied Italian and English translation at the Saarland University in Saarbrücken, Germany. She subsequently completed a further graduate program in German as second language. Following her studies, Ms. Mering worked for the Italian consulate in the Saarland, as a teaching associate for German as foreign language at Saarland University and as a spokesperson and head of the office of the director of the state media authority of Saarland. From 2006 to 2013, Ms. Mering was then employed as a lector for the DAAD at the German Jordanian University in Amman, Jordan, and subsequently at the Salahaddin University Hawler in Erbil, Iraq. In July 2013 she returned to the DAAD headquarters in Bonn, where, from 2015 till September 2018, she headed the department for ‘Transnational Education



Projects in the Middle East, Africa and Latin America’.

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## **Science Diplomacy for Sustainable Development – The role of the International Science Council (ISC) and its Regional Office for Africa (ROA)**

Nomasomi Gasas

ISC Regional Office for Africa, Pretoria, South Africa

Despite the critical role women have been playing in the field of science, the number of African women who enter science programs in higher education institutions is always less than that of men. Institutional policies, educational and work environment conditions are often not female-friendly and contribute to the under-representation of women in science. The ISC is ensuring that the transdisciplinary research through grants, like the Leading Integrated Research for Agenda 2030 in Africa speaks to policy makers through programs such as The International Network for Government Advice (INGSA). This program provides the forum for policy makers, practitioners, national academies and researchers to share experiences, build capacities, and develop theoretical and practical approaches to the use of scientific evidence in informing policy at all levels of government. The ISC ROA is secretariat to the Africa chapter of INGSA formed in March 2016 following the Southern African Regional Workshop in South Africa in February 2016. It also provides some

seed funding towards its activities. The Office also sources and avails funding for scientists (especially early career researchers) to attend international events to present their works as well as interact with renowned scientists from Africa and other parts of the globe. ISC ROA is working with and supportive of all initiatives/programs in Africa that seek to promote women’s participation in science diplomacy as well as mainstreaming of women in all programs in science, engineering, technology and innovation.

### **Nomasomi Gasas**



Ms Gasas coordinates ISC ROA activities related to the Leading Integrated Research for Agenda 2030 in Africa (LIRA2030) program. She holds a Master of Science Degree with specialization in Medicinal Plant Sciences from University of Pretoria, South Africa. Prior to joining ISC ROA, Ms Gasas has been working as a Research Administrator Intern at the National Research Foundation, South Africa

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### **L’Oreal UNESCO for Women in Science Program for Egypt**

Nagwa Abde Meguid

UNESCO/L’Oreal Laureate, National Research Center, Egypt

today, and only 3% of Scientific Nobel Prizes were awarded to them. This is why for the last 21 years, L’Oreal Foundation and UNESCO have been committed to increase the number of women working in scientific research. Thanks to the prizes and fellowships awarded, L’Oreal Corporate Foundation and UNESCO have been committed to increase the number of women working in scientific research. Proudly, 2018 L’Oréal Foundation announces the launch of L’Oreal UNESCO For Women In Science Program for EGYPT. The Program aims at honoring more exceptional researchers and scientists from Egypt who help scientific knowledge progress and serve as models for younger generations. This will to empower Arab women scientists, recognize their achievements and contributions to the progress of scientific research, and acknowledge the role they play in the development of their countries. As a Human geneticist and Former Laureate, I was chosen to be the Jury president of this respective initiative in Egypt. Following the Huge success of the past year, L’Oréal and UNESCO decided to launch the For Women In Science Program for EGYPT program for the second year (2019). Since the creation of the program in 1998, over 2,250 greatly talented women have been distinguished in over 110 countries. Awarding her is not only well-deserved recognition for her outstanding contributions to science and society but it also will give more exposure to her work expanding her opportunities to make life lighter for the most vulnerable amongst us and inspire others to follow in her footsteps.

### Nagwa Abde Meguid



Dr Meguid is a professor of human genetics and Children with Special Needs and Former Head of Human Genetics Unit, at the National Research Center (NRC) in Egypt. She holds a Ph.D. in Human Genetics, and she is a Senior Geneticist at the Genetics Institute, Pasadena, California; a fellow of Uppsala University, Sweden and Yale University. She was one of five selected scientists to win the outstanding L’Oreal UNESCO Award for women in Science for Africa & Middle East (2002). She has used her expertise to identify and describe several novel genetic syndromes. She was given the Distinctive Arab Female Scientist Prize Creative Women in Genetics by the Arabian Gulf University, Bahrain, 2009. Finally, was awarded with the National State Award of Excellence in Advanced Medical science Technology, 2016. She is the Founder of Autistic disorders Clinic in the NRC. On the other hand, she is the head of the laboratory of research in DNA in genetic behavioral disorders. Member in the National Committee for Women in Science and Technology, member of the International Jury member« For Women in Science » Awards. Jury president for Women in Science; Egypt. Supervised around 60 Ph.D. & master theses. She has more than 70 International publications in distinguished International Journals. Member in Gender Research in Africa into Information Communication Technologies for Empowerment (GRACE) through the International Development Research Centre in Canada (IDRC). She is member in Bioethics Network on Women's Issues in

the Arab Region. Head of CONEM Egypt Child Brain Research Group and member in Council for Nutritional and Environmental Medicine, Norway.

## Story of Chemists Without Borders

Maria-Stella Portelli

Chemists without Borders, Malta

Chemists Without Borders is a non-profit organization with the mission of solving humanitarian problems by mobilizing the resources and expertise of the global chemistry community and its networks. Chemists without Borders envisions a global support network of volunteers providing mentoring, information, and advice to ensure every person has affordable, consistent and persistent access to essential medicines and vaccines, sufficient safe water, a sustainable energy supply, and education in green chemistry, amongst others. As a reflection of these goals, the projects supported by the organization vary widely in location and scope. In Bangladesh, a simple, extensive, cost-effective model to fight arsenic poisoning in water was devised and is being implemented. In parallel, partners at the University of Massachusetts are developing a relatively inexpensive, easy-to-use test kit to measure arsenic levels in rice. Water quality is also being monitored in the US, as a reaction to the water crisis in Flint, Michigan, resulting from lead contamination. In terms of climate initiatives, the use of biochar in

agriculture, both commercially and at a subsistence level, is being investigated. Moreover, chemistry education is being supported by developing microchemistry kits to enhance student learning in Sierra Leone. Chemists Without Borders collaborates extensively with AIDSfreeAFRICA, which is building pharmaceutical manufacturing facilities in Cameroon to be owned and operated locally. It also works closely with a group of researchers at the University of Notre Dame to develop and distribute low-cost, paper-based tests to determine the authenticity of drugs in Kenya and other countries.

### Maria-Stella Portelli



Maria-Stella Portelli, a director of Chemists Without Borders, will be presenting the active projects of the organization. Stella is currently reading for a Masters of Science in Natural Environment and Resources Management at the University of Malta. She also currently holds the position of a medical writer at a healthcare company and has previously worked as a research chemist in the pharmaceutical industry. Stella received her B.Sc. in Chemistry and Biology from the University of Malta in 2013. Amongst other places, she has travelled to India, Kenya, Colombia, Brazil and Peru, where she worked on various voluntary projects with different organizations. For 4 years she was also an active committee member of IAESTE Malta. She started volunteering with Chemists Without Borders in March 2017 and joined the board in October 2017. The original concept of Chemists Without

Borders came about in response to an article in Chemical and Engineering News in 2005. Dr. Bego Gerber had read the article “Carbohydrate Vaccines” and suggested that the world perhaps needed a humanitarian organization for chemists similar to Médecins Sans Frontières for doctors. Dr. Steven Chambreau responded to Dr. Gerber and although the pair had never previously met, they decided to pursue the development of Chemists Without Borders as a global humanitarian organization to utilize chemistry and mobilize chemists to solve humanitarian challenges. The incorporation (2005) and the establishment of the non-profit status (2008) of Chemists Without Borders led to the development of the mission and vision.

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## SDGs and Gender Equality in Japan

Miyoko O. Watanabe

Japan Science and Technology Agency

Sustainable Development Goals (SDGs) are universal goals applicable to all developing countries and developed countries in the world, pledging “No one is left behind” through the implementation process. The progress toward achieving SDGs has been published in the SDG Index and Dashboards Report for each country annually since 2016. The most insufficient SDG in Japan has been Goal 5: Gender Equality (GE) in these reports. Promotion of GE is an indispensable issue to achieve SDGs in Japan. In order to promote GE,

various research has been done and published recently. The typical research was the comparison of economic value of patents in engineering between male teams and mixed-gender teams in Japan. The results showed that the average value of the patents by mixed-gender teams was 44% higher than that by male only teams in 2016 and was 54% higher in 2018. The other data have been analyzed with a factor of gender and showed that gender is an important factor for science, technology and innovation. Dialogue and communication are also important to share the problem and the research results with various stakeholders in the society. A lot of symposium and talk sessions on GE have been set up by many organizations. It should be also noticed that GE can bridge all other SDGs and all of the people in the world. We proposed the concept of “GE 2.0”, focusing on diversity with which many other factors, culture, geography, ethnicity, race, age, men, boys and so on can be connected with GE, and it will supply a new approach toward achieving SDGs.

### Miyoko O. Watanabe



Dr. Miyoko serves at Japan Science and Technology Agency (JST) as Deputy Executive Director, Director-General of Center for Science

Communication and Director of Office for Diversity and Inclusion. She has a long experience of research in semiconductor physics at Toshiba R&D Center in Japan, and she conducted her physics research as a Postdoctoral Fellow at Dalhousie University, Canada, from 1986 to 1988

and as a Visiting Researcher at Nanoscale Physics Research Laboratory at the University of Birmingham, U.K., in 1997. Returning to Toshiba, she served there at different positions, including that of Executive Quality Leader at Innovation Division in the headquarters. She has been working at JST since 2013. She also worked as Council Member of Science and Technology Council at Ministry of Education, Culture, Sports, Science and Technology from 2012 to 2017, as Chairperson of Japan Women Engineers Forum from 2012 to 2014, and as Auditor at National Institute for Environmental Studies in Japan from 2013 to 2015. She has also been Council Member of Science Council of Japan (SCJ) since 2011, and Vice-president of SCJ in charge of science and society since October 2017. She worked as Chair of Committee on Comprehensive and Synthetic Engineering in SCJ from 2014 to 2017. Dr. Watanabe has been a member of Specialist Committee on Priority Policy in Council for Gender Equality of Cabinet Office of Japan since 2014. She was the chair of both Science Agora in 2015 and 2016 and Gender Summit 10 in Tokyo in 2017.

science. In Germany, women comprise 33% of enrolled Physics students, while 25%, 28% and 13% of women in Finland, Poland and Norway respectively are into scientific track. The low participation of women in STEM fields is an erroneous impression that STEM are for men who are intellectual. Indicators show that tertiary education in the Arab region represents 25% of the eligible population, which is high compared with gender balance in several countries; there is even an imbalance in favor of women as in Saudi Arabia & the Gulf States. There is a surplus of un-employed women graduates in STEM. However, efforts are on-going to encourage women in S&T. Cooperative scientific projects with female science/medical and IT graduates could have several mutually beneficial outcomes including: (1) Help raise the profile of Arab women as productive scientists, (2) Allows women "well settled" within their own society, (3) Facilitate the transfer of technology, (4) Be an example of positive exchange between the Arab world and the west, (5) Provide scientists from outside the region access to an under researched region.

## Arab Women in STEM Fields: The Way Forward

Samira Ibrahim Islam

King Fahd Medical Research Center, Saudi Arabia

In most countries of the world, 40 to 50 % of students are women. However, there is much greater sex imbalance in the area of

### Samira Ibrahim Islam



The first ever Saudi woman, in respect to all subjects and specialties related to completion of secondary education, obtaining Bachelor and Ph.D. degrees and becoming the first full female professor of Pharmacology. In 1996, she was assigned as WHO Regional Adviser for Essential Drug Program (EMRO). She was selected in January 2000 as the first

woman from the Muslim and Arab world among the 32 distinguished shortlisted women scientists around the world for the HR/L'Oreal/UNESCO "Women in Science Award" in Paris. In May 2000, UNESCO/ L'Oreal held special ceremony on her honor in Dubai inviting all the Regional and Arab universities and some high profiles key personalities. In May 2009, she was awarded the "Makkah Award for Excellence" for her exemplary contribution to Science & Research, the highest distinction ever awarded to Saudi citizen. Her researches focus on pharmacogenetic/pharmacokinetic and phenotyping which defined the Saudi population profile in pathways of some drug Metabolism that became the reference in literature. She founded the Drug Monitoring Unit, providing drug blood levels data for publication thus empowering researchers and guiding the treating doctors to adjust the dose according to individual patient safety. She published high level 131 research articles.

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### **JST's Approach for Promoting Active Participation of Female Researchers**

Yoshiaki ARAKI

Japan Science and Technology Agency, Japan

Although the importance of promoting gender equality in science and technology has been recognized, gender equality in Japan is still in a situation of playing second fiddle to various countries around the world. For example, "Global Gender Gap Index 2018" by the World Economic

Forum (WEF) shows that Japan (Score: 0.662) is on the 110th place among 149 countries (the lowest in G7 countries), and "Readiness for the Future of Production Report 2018" by WEF also Shows that Japan is on the 49th in 100 countries in respect of "Female participation in labor force" which is one of the evaluation criteria in the report. In addition, although the proportion of women in all researchers in our country is on an increasing trend year by year, it still remains low at 16.2% (as of the end of March 2018). Meanwhile, when we look at the proportion of application by women and adoption of women in the JST funding programs, we find the percentages to be very low; for example, PRESTO - 12.3% for application, 9.6% for adoption, CREST- 5.9% for application, 1.9% for adoption in FY 2017. In order to increase the adoption ratio of female researchers, any measures to increase the number of applications by female researchers should be taken. Therefore, in order to study how to cope with this situation, we held a female researcher opinion exchange meeting in September and October 2017 and also conducted a survey research (questionnaire) in December 2017 with a view to advancing the diversity and inclusion in JST R&D projects, where we tried to collect opinions mainly on countermeasures to increase the number of female applicants and whether implementing affirmative actions for female researchers into R&D projects are necessary or not. As a result, we could obtain various feedback such as "there is no big objection to implementing affirmative action for female researchers", "there is a tendency for women to believe that funding is male-centered and

disadvantageous for women, and so they tend not to apply". Based on these results, we organized a symposium entitled "Creating the future together with Female Researchers" in April 2018, in order to share problems at R&D sites and discuss strategies to solve them, from the viewpoint of increasing the number of women's participation in R&D projects by public funds. In the symposium various discussions were made on the significance of women's participation, the circumstances surrounding female researchers, and the fact that it might be easier to research abroad than in Japan. In this session, I would like to introduce the efforts that we are currently making to promote female researchers' active participation and realize gender equality.

### Yoshiaki ARAKI



Mr. Yoshiaki Araki joined Japan Science and Technology Agency (JST) in October 2016 as a member of Office for Diversity and Inclusion. He was engaged in organizing the Gender Summit 10 held in Tokyo in 2017 as a member of the secretariat. He is now in charge of tasks including the operation of "childbirth · child rearing · elderly care support systems" to assist the work-life balance of the researchers engaged in various R & D projects funded by JST. Prior to joining JST, Mr. Araki had worked for a Japanese non-life insurance company for thirty-six years, where he was engaged mainly in hull and cargo

marine reinsurance, transacting business with many foreign insurance markets such as Lloyd's of London in U.K. He graduated from International Christian University (ICU) in Tokyo.

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## The State of Young Scientists in Egypt: Implications for Sustainable Development

Abu Elnasr Sobaih,

Applied Science University, Bahrain

Young scientists play an increasingly important role in the knowledge-based economy, where research and innovation are the drivers of economic growth and development. They are the key creators and innovators that provide the intellectual capital needed to grow strong national research and innovation systems. Understanding precisely how young researchers can succeed in and contribute to the knowledge landscape, and what obstacles they encounter would provide a platform for sustainable development. For this purpose, a survey on young scientists was designed to address the lack of evidence on the profiles and research experiences of postgraduate students and postdoctoral fellows in many developing countries, using Egypt as a case study. The survey was designed to understand the general needs of Egyptian young scientists and identify shortcomings in science, technology, engineering and math as well as social sciences and humanities. The survey evaluates the status of system from young scientists'

and their overall satisfaction. The survey targets all young scientists in Egypt in all disciplines, mainly those in public research centers and public universities. A random sample representing the whole population was employed. The results of the survey showed that despite the several initiatives by the government to empower young scientists, research culture, environment and infrastructure need more interventions by policy makers since this has impacted on scientists' brain drain. The communication gap between young and experienced is critical for supporting young scientist and for ensuring sustainable development. It is hoped that the recommendations of the study impact on science policy reform in relation to postgraduate students and postdoctoral fellows to initiate the necessary programs and support actions for young scientists and ultimately for sustainable Egypt.

### **Abu Elnasr Sobaih,**



Dr. Sobaih is an associate professor of human resources management at the College of Administrative Science, Applied Science University, Bahrain. Prior to this, he was an associate professor of management at the Faculty of Tourism and Hotel Management, Helwan University, Egypt. He also was a visiting professor in Cardiff Met. University, (UK) and Virginia Tech University (USA). Dr. Sobaih undertook his post-graduate studies and received his PGCASR and MPhil/Ph.D. in human resources management from Cardiff Met. University, UK. Dr. Sobaih has a great experience in conducting several projects

and research studies for national and international professional bodies (e., ASRT and STDF (Egypt), USC (USA), ESRC (UK). He is Fellow of Academy of Scientific Research and Technology (ASRT); Member of the Technical, Support and Evaluation Office; Member of Social, Human Research Council and Population; and Egyptian Young Academy of Science. He is also an editorial board member of lifelong Education journal and a reviewer in a number of international bodies and academic journals, e.g. IJHM, IJCHM.

### **State of trans-disciplinary science research in Africa: A snapshot from submissions to the 2018 Women in Science Without Borders Conference**

Juanette John

Council for Scientific and industrial Research, South Africa

There is general consensus that, interaction between different, sometimes even unrelated-disciplines, can greatly enhance the success and impact of solutions. As such, the over-arching theme of the 2nd international Women in Science Without Borders (WiSWB)-Indaba (conference) which was hosted in South Africa in March 2018 was "Resilience in Diversity". Submissions were solicited in areas informed by the Sustainable Development Goals. A total of 650 submissions were received, of which 515 were from 27 countries in the Africa-Arab region. An envisaged outcome of the conference was to establish a database of



meta-data from the submissions to identify common goals in the region using Kumu, an open-source mapping tool. Kumu provided an ability to explore and visualise inherent complex relationships within the submission meta-data, by location. Preliminary results reveal that the country with most submissions was Nigeria (55%); more than 60% of submitters were in the 30-45 age groups and that almost 50% of the main author qualification was at doctorate level. The largest number of submissions was under the Health theme (26%), followed by Food Security (17%) which is indicative them being the two most urgent trans-disciplinary problems in the Africa-Arab region in this period.

### Juanette John



John is an Environmental Health scientist, working at the CSIR for over 20 years. Her interests include vulnerability, sustainability and spatial analysis. She is passionate about networking to improve research collaborations and impact.

### How to build a successful academic career? what is below the tip of the iceberg?

Mohamed A. Farag

Chemistry Department, American University in Cairo, Egypt

One of the unspoken rules in research is that a successful career in science is only possible with one or more papers with an impact factor above 10 or higher. This belief creates a lot of peer pressure among young scientists and may be even one of the causes of increasing numbers of scientific fraud cases. But is it true? To answer this question, it is crucial to get a very clear idea what “a successful career in science” means for you. It is very simple: If you want to work and succeed in an academic environment you must be prepared. Here, I provide unvarnished advice for young scientists on the difficulties that lie ahead and on how to escape the bottle necks most researchers go through in their career to succeed. Opinion presented in this talk is based on Dr. Farag 23 years of experience in academia and to cover issues related to how to think scientifically, present & publish in an upmost level. Talk is presented in a cartoon way for all to hopefully enjoy!!

### Mohamed A. Farag



Specializing in metabolomics, natural products chemistry, and plant biochemistry, Mohamed A. Farag completed his PhD at Texas Tech University, USA, in 2003. In 2005, after spending time as a postdoctoral fellow at The Samuel Noble Foundation, USA, and the James Graham Brown Cancer Center, USA, he became assistant professor in 2005 at the Faculty of Pharmacy, Cairo University, Egypt. Since 2009, Dr Farag has been working as a part time visiting professor at the

Technical University of Munich, Germany, to participate in teaching plant metabolomics and chemometrics modelling for master students, and in 2009–2010 he held the Alexander von Humboldt fellowship at the Leibniz Institute for Plant Biochemistry, Germany. Dr Farag now works full time as a professor at the American University in Cairo (AUC) where his research work focuses primarily around applying innovative biochemical technologies (metabolomics) to help answer complex biological questions in medicine, herbal drugs analysis and agriculture. Dr. Farag has been recognized with several awards, including Abd el Hameed Shoman award (2016), Egypt Higher State Incentive Award (2012), Cairo University Incentive Award (2009), TWAS award in science diplomacy (2014), and the Mass Spectroscopy Performance Award, TTU, USA (2004). For his highly cited publications of 100 scientific papers with close to 4000 citations, Dr. Farag was selected as a top researcher in the field of plant biology in Africa by the American society of plant biology, USA.

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## **Clarifying the language of Science for cross-disciplinary communication**

Antoinique van Staden, Sonali Das  
University of Pretoria, South Africa

Communication in Science, even between disciplines in related fields, is complex because it requires us to write with accuracy and specificity, often about abstract constructs. This necessitates a

specialized vocabulary (a jargon) which is constantly growing as new discoveries are made, new technologies are invented and new relations need to be described. The language of science needs to prioritize processes, interactions, specific conditions, causes and effects, as well as evidence. Where assumptions are made about the prior knowledge of the readers, clarity is often sacrificed, and communication may be hampered. With the global scientific society ever expanding to include more people and different languages, the need for different scientists from various countries to be able to communicate is obvious. English has become the common language of scientific communication, but a basic shared vocabulary may not be enough where new concepts have to be conveyed and people's home languages differ considerably on a grammatical level (e.g. English and Zulu). How can we address these difficulties? This paper argues that one way to overcome them is to use appropriate Plain Language principles, which focus on the reader and making a document accessible through micro-editing (minor vocabulary and grammatical changes) and macro-editing (structural considerations). The paper demonstrates the advantages of this approach by means of sample texts from various technical documents.

## Antoinique van Staden



Antoinique van Staden is a language practitioner with a passion for writing and editing. She is currently working on a PhD with a focus on Plain Language principles for scientific writing. After working with several engineers, she realized the importance of effective communication in this interdisciplinary and competitive field. She has presented on the topic at the WISWB and SATI Third Triennial Conference in 2018.

## Catalysing Science Diplomacy for the Global South

Global Young Academy Science Advice working group

Since the workshop is in Science Diplomacy we would like to focus our panel into the area of “Diplomacy for Science” and “Science for Diplomacy” since one of the biggest barriers that developing countries face today is access to resources to facilitate and promote the academic and professional development of youth. For young students and professionals, lack of opportunities has a direct impact in the economic and social development of their countries. Thus, one of the main challenges today is how to effectively promote and foster access to academic and professional opportunities for youth in developing countries and lever these to catalyse new knowledge and new technologies for their own economic and social growth. Today, we find strong global organizations that

advocate for young scientists and professionals around the world. Organizations such as Science Academies, Governmental Institutions or international organizations such as Ekpa’palek (Latin-America) and the Global Young Academy (International) provide resources and access to an international network whose mission is to empower young researchers and professionals from around the world. These organizations are working to unleash all of the talent and potential that exists in developing countries and whose contributions have too often gone unnoticed because of lack of essential resources, such mentorship, academic advising, collaborative environments, as well as gender and race disparities and discrimination. In this panel, we will discuss the work of three organizations whose mission is to empower, connect and mobilize talent from all six continents. Our aim is to cross-pollinate ideas and find new avenues that these organizations can implement to increase their influence and impact around the globe with emphasis in the South and in promoting South-South collaborations. Furthermore, we aim to elaborate and present a proposal/statement to promote the cooperation among Latin America, Africa, and Asia (The Powerful South), to share and synchronize best practices and expand opportunities for young talent in the three regions.

## Rationale for Inclusion in Science Diplomacy

The lack of mentorship and academic/professional advice in many countries around the world make it

difficult to effectively train the next generation of researchers and professionals, those that will create the knowledge and technology to foster economic and social growth and address humanity's greatest challenges. Therefore, it is crucial that international mechanisms and multi-lateral collaborations are put in place to help train, connect and mobilize young students and professionals around the world. This will benefit the entire globe since often times problems we face today in some parts of the world often overshadow what other parts will face in the future. Our panel proposal will connect organizations working to empower young researchers and professionals in the southern hemisphere and provide a forum where new collaborations may be established. In essence, this is science diplomacy at work. These organizations (the ones where the speakers are currently working) are using the power of the scientific endeavour and its essential collaborative character to connect more young students, researchers and professionals from developing countries around the world to a network that will help advance their careers and also build the global capacity we need to address humanity's present and future challenges.

#### **Clarissa Rios, Peru/ Switzerland**



Dr. Clarissa is a scientist with experience working at the Ministry of Environment in Peru and at the European Commission providing science-based

evidence and advice for policy making. She is the Founder and Director of the non-profit Ekpa'palek which is focused on the empowerment of young professionals in Latin-America. She also has experience as a UN Women champion for women's economic empowerment, a UNESCC delegate, an Emerging Leader at the Atlantic Dialogues, a Young fellow at the Raisina Dialogues, a newspaper collaborator, an advisor at Womer Economic Forum and as a co-lead of the Science Advice working group at the Global Young Academy. Her work is also related to science diplomacy, gender equality, reduction of Inequalities and education for the Sustainable Development Goals. Praised international speaker, a leader with excellent communication and people skills. Global experience living and working in Germany, Italy, Finland, Sweden, Peru, Australia and The Netherlands. Currently working in Security Policy, equality and peace as a fellow at the Geneva Centre for Security Policy.

#### **Orakanoke Phanraksa, Thailand**



Dr. Phanraksa is a policy specialist in the field of intellectual property laws. Currently, she is

with the Technology Licensing Office,

Technology Management Center at the National Science and Technology Development Agency, Pathumthani, Thailand, as a manager of the Intellectual Property Policy group. Since 2010, she has been working closely with the Office of the Higher Education Commission and has played a key role to form a policy

framework to promote and strengthen technology licensing offices and IP professionals in the academic institutes in Thailand. This effort has further extended to a recent collaboration between the World Intellectual Property Organization, the Department of Intellectual Property, and NSTDA to run a six year project titled the “Enabling IP Environment” in Thailand. She is one of the founding members of the Licensing Executive Society Thailand and serves LES Thailand as the Vice President (2017–2019). Apart from her professional works, Dr. Phanraksa was also former Co-Chair of the Global Young Academy (2014–2016). To pursue her efforts in supporting young scientists, she has lead two major regional projects titled the “Global State of Young Scientists in ASEAN” and “ASEAN Science Leadership Program”. She is currently Co-Chair of the ASEAN Young Scientists Network.

### **Meron Zeleke, Ethiopia**



Dr Meron Zeleke is an Associate professor of Social Anthropology with over 10 years of research and teaching experience. She holds a PhD in Social Anthropology from the Bayreuth International Graduate School of African Studies, Germany. She has MA in social Anthropology and BA in history from Addis Ababa University. She is a senior Postdoctoral research fellow and is currently working on a research project on Female labor migration from the Horn of Africa. She was and is engaged in numerous research projects funded by different international development such

as the World Bank, DFID, and EU. Dr Meron has authored two books, several journal articles in renowned peer reviewed international journals and book chapters. Her core areas of research Interest and Expertise includes: Gender, Migration, conflict and religion. Meron served as the chair of Eastern African Chapter of African Good Governance network (AGGN). She has international teaching and research post experience. She was a visiting scholar at York University in Canada, California State University (USA), University of Singapore, and University of Wake Forest in North Carolina and university of Bayreuth in Germany

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### **“Day Zero: Water Security in the Wake of Climate Change”**

Amira Sayed Ahmed

- What is the role of journalism in climate change debate?
- Does journalism influence the general public attitudes toward climate change and does this influence extend to government decisions about mitigation?
- How journalism portrays climate change?
- What is the effect of journalism on climate change opinion?
- How journalism portrays climate change?
- How new media technologies are change the landscape and dynamics of the world and climate change?

## Amira Sayed Ahmed



My name is Amira Sayed Ahmed. I am an Egyptian journalist with five years of experience and Egypt's Representative at the World Youth Parliament for Water (WYPW). In 2007, I was one of thanaweya amma top ten achievers in Egypt. I ranked fourth. Then, I graduated from the Faculty of Languages and Simultaneous Interpretation with honors. I also got diploma in media translation from the American University in Cairo. I started my career as a journalist in 2013. I am writing for the Egyptian Gazette, the first English-language daily in the Middle East and now it is affiliated to " Gomhuria" newspaper. I covered many conferences inside and outside Egypt. This year, I got selected to represent Egypt at the 4th General Assembly of WYPW held in Brazil . I am also political analyst at Nile TV International ( Maspero) as I take part in press review segment in Breakfast Show on a weekly basis. Now, I am Establishing Egypt's Youth Parliament for Water with the aim of further engaging young people to act for water.

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## Closer to the Truth

Salma Hassaballa

Writers Union, Egypt

The "closer to the truth" project is produced in an attempt to verify the objectivity of many scientific claims. Despite the neutrality of science, there are disputes among scientists about critical

issues, like Darwin's evolution theory, the essence of our consciousness, near death experience, parallel universes, the possibility of producing a living cell in the lab, etc. The controversies have extended to include issues regarding the limit of the scope in science. When investigating the credibility of the Near- Death-Experience in the project of 'Beyond Life', it was shown that the scientific claims regarding this area are not always objective (Hassaballa, 2011). For, the trigger of the dispute among many scientists is not based on scientific evidence, rather based on scientists' different beliefs. Thus there is a need to assess the credibility of many other scientific issues like those mentioned above. Consequently, there is a necessity to raise awareness in the scientific community regarding the fact that scientists are humans, thus their objectivity is questionable, despite their discipline that is evidenced based. The project is made of 30 episodes. Each is 15 minutes long and will discuss a scientific claim or finding with scientists who have opposite views. A comparison with an assessment regarding the integrity of the claim will take place. The dramatic scenes are to be blended with scientists' interviews to combine the most unusual topics in thrilling TV investigations, dynamics of digital imagery and the power of drama. Nothing is as important as knowing the truth!

## Salma Hassaballa



Salma Hassaballa is a graduate of faculty of Engineering, Architecture department, Cairo University, 1988. She worked as part time graphics instructor at the Engineering Services, American University in Cairo from 1995 to 2012. She worked as a programmer to facilitate the conceptual design for architects from 1990 to 1992. The project was accepted for an oral presentation in the international research conference on housing in Montreal, Canada 1992. She was a Multimedia manager in a leading Egyptian computer company, "Comutek" from 1994 to 1996. In 2003, She was one of nine in total to receive the Discreet Certificate (Discreet was a subdivision of Autodesk International Company in the US). A year later, she produced 3D graphics tutorials on the net, which were appreciated by Discreet and published in famous 3D sites in different languages. In 2001, she used her multi talents to start her independent production & work. She produced English & Arabic songs, graphics episodes for children. In 2005 she started documentaries production. In 2007, she produced her award winning "do you believe?" documentary, which won a golden medal in the Everglades film festival in South Africa and was nominated in Swansea film festival in the UK. In 2011 she produced "beyond life" documentary that was screened in notable places like the opera house in Egypt and Columbus library in Ohio USA. Since 2013 she has written 9 books and

novels of different genres. Currently she is a member of the Writers Union of Egypt.

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## Domestic violence

Amani Abdel Fattah

Faculty of Medicine, Cairo University, Egypt

Domestic Violence (also named family violence) is an important public health issue in the developing as well as developed countries. There are several types of domestic violence including violence against women, child abuse, male abuse and elderly abuse. Violence may take many forms such as verbal abuse, physical abuse, emotional abuse, financial abuse, psychological abuse and neglect. Research has established that there exists a direct and significant correlation between a country's level of gender equality and rates of domestic violence, where countries with less gender equality experience higher rates of domestic violence. There are several factors contributing to the increased prevalence of domestic violence worldwide such as poverty, low socioeconomic level, drug abuse, psychological disorders of the parents, unwanted children and early age of marriage on certain countries. Researchers and Scientists conduct a lot of researches on domestic violence statistics, its causes, predisposing factors, and put a lot of recommendations to decrease its incidence but survivors of domestic violence need more attention and strict regulations and the society in the whole world needs more awareness

about family violence. The rate of family violence crimes has unfortunately increased in Egypt in the last year. This presentation aims to highlighten the problem of domestic violence in the whole word especially in Egypt and Africa and to put suggested strategies to help survivors of domestic violence

### Amani Abdel Fattah



Dr. Amani Abdel Fattah is an ambitious Egyptian forensic doctor specialized in cases of domestic violence. She is very interested in the “Social Impact of Medicine” to make the people from different cultures and social levels benefit from the results of the scientist’s researches. She is a presenter of TV program called “Medicine and other things” which is also the name of her Facebook page aiming at spreading awareness of Domestic Violence in the first place in addition to other medical issues in different specialties. She was chosen by a non-governmental NGO organization called “ESRAA EL ZAT” to be appreciated as one of the public figures who make great efforts to confront all shapes of violence in the Egyptian society in a great ceremony held at Ritz-Carlton at May 2018. She gave many lectures about domestic violence in different faculties of Cairo University (faculty of computer and information systems, faculty of Archeology) and Ain-shams University ( faculty of Pharmacy . faculty of Agriculture). She conducted a lot of researches on different types of domestic violence such as female abuse and child abuse. She wrote many published articles

on the different types of violence. She was chosen for 3 successive years 2016,2017 and 2018 by her Egyptian and Malaysian students to be appreciated by the Dean of Faculty of Medicine- Cairo University for her great efforts in education of forensic medicine. She is the head of large medical family “Doctor’s society” at Kasr Al-Aini hospital.

### The past, present and future of E-JUST

Maha.Elsabrouty

Japanese University in Egypt (E-Just), Alexandria, Egypt

Bringing together Japanese style, education, concepts and cutting-edge technologies all in one physical location, Egypt-Japan University of Science and Technology (E-JUST) is the first university endorsing Japan's name, industry, culture, educational systems, academic and research concepts outside Japan! E-JUST is a living example to the successful implementation of Science and Technology Diplomacy. With the objective of serving the Egyptian community, Arab world and Africa, E-JUST exposes its students to an education that combines rigorous academic study and excitement of discovery adopting the Japanese education and research essence. Located in Alexandria – the second largest city in Egypt with its ambience and cultural heritage – within the premises of New Borg El-Arab City – one of the booming industrial zones in Alexandria, E-JUST distinct location enables dedicated



academic scholars and researchers to fully engage in a high-tech community with relevance to the practical world. Extended on 840.000 square meters, the proposed campus is planned to be designed and constructed in a matter that represents cutting-edge technologies of the 21st century while reflecting Egyptian and Japanese cultural values and identities. With its libraries, museums, botanical gardens, sports and athletics, convention center and auditorium, science gallery and park, centers of excellence and recreational opportunities, E-JUST allows its scholars to find more to college life than just attending classes. E-JUST is focused on encouraging personal integrity and academic excellence alongside fostering forward thinking philosophies, innovation and teamwork spirit. Being research oriented, the Japanese style of education focuses on making students learn how to think; not what to think which encourages students to develop problem-solving and analytical skills through the personalized and independent approach to learning.

### Maha Elsabrouty



Prof. Dr. Maha received her BSc. in Electronics and Electrical Communication Engineering, with honors from Cairo University, Egypt. She received the M.Sc. and PhD degrees in Electrical Engineering from the University of Ottawa, Canada. Currently, Prof. Elsabrouty is with E-JUST University, department of Electronics and Communication Engineering (ECE) since

September 2010, where she is involved in Teaching graduate courses, supervising Masters and PhD students and conducting several advanced research work granted by funding agencies in Egypt and abroad. Her current research interest focuses on physical layer techniques, advanced methods of channel coding, MIMO coding, Cognitive radio and wireless sensor networks. She has supervised over 10 PhD theses and 10 MSc. Theses. Dr. Elsabrouty has also acted as the executive director of the center of innovative technology (CINTECH) from January 2015 to January 2018. The center is responsible for technology transfer, patent filing and communication with the industry along with supporting spin-offs and start-ups. Dr. Elsabrouty has been a key member in developing the 1st innovation cluster in ICT in Egypt in Borg Elarab, specialized in the internet of things as part of the fund from ITIDA from 2017 to 2022. She has also been active advocate of entrepreneurship and industrial cluster, attending several courses and establishing strong ties with the innovation ecosystem all over Egypt.

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### Activities of School of Energy Resources, Environment, Chemical and Petrochemical Engineering toward Sustainable Development EECE School, EJUST

Prof. Mona Gamal Eldin

Egypt - Japan University of Science and Technology (E-Just)

The EECE School has been providing innovative research in the fields of energy, environment, and chemical engineering since its foundation in 2009. There are three departments: Energy Resources Engineering, Department of Environmental Engineering in collaboration with Tokyo Institute of Technology (Tokyo Tech), and Chemical and Petrochemical Engineering in association with Kyoto University. The scarcity of resources, the dangers of climate change, and the dependence on fossil fuels are major issues that confront the 21st century. Therefore, at our school we educate our students on how to develop alternative methods that generate clean and sustainable environment. We also train them to provide innovative methods for energy production, water reuse, overall natural resources conservation and clean technologies. Prof. Mona Gamal Eldin-Dean of EECE School - has performed many research projects like Chemical Security program funded by Civilian Research and Development Foundation - CRDF Global and Low-grade heat recovery for absorption chiller and desalination from concentrated solar powered steam power plants in Egypt in collaboration with Cranfield University (CU) and funded by Science and Technology Development Fund, STDF. Prof. Mona Gamal Eldin has concluded many initiatives as a part of the EECE school social responsibility and organizing many activities related to the high school students; like Science, Technology, Engineering and Math School in New Borg El Arab City (STEM). Not only the EECE school programs mainly limited to the male students, but also prof. Mona Gamal Eldin has developed programs to

increase the percentage of female students and encourage them studying STEM field both under graduate and post graduate programs, through an initiative with Progirls program in collaboration with Goethe Institute as a part of The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

### **Mona Gamaleldin Ibrahim**



Professor Mona G. Ibrahim serves as Dean of Energy Resources, Environment and Chemical and Petrochemical Engineering School for Egypt – Japan University of Science and Technology (E-Just), she also served as Acting Vice President for Education and Academic Affairs (2016 -2018). In her capacity as a researcher, Prof. Ibrahim had published many scientific publications over 25 years covering most significant environmental fields. Prof. Ibrahim represented Egyptian NGO's in many African countries as a steering committee member for Nile Basin Initiative (NBI) focusing on "Confidence Building and Stakeholder Involvement Project" funded by World Bank and was honored with the shield of Euro-Arab Cooperation Center for her prominent role in saving the environment. In August 2018, Prof. Ibrahim had the chance to share as an expert for the selection of the graduate students for the Pan African University Institute of Life and Earth Sciences at the University of Abadan, Nigeria under the flag of African Union Commission. Being a rapporteur of Consultant Committee of

Development and Environment in Bibliotheca Alexandria (2003- 2005) plus possessing a high rank employment position as an Under Secretary for Ministry of Environment (2007 - 2012), gave Prof. Ibrahim a great opportunity to experience, sharpen and apply her strong leadership skills. Prof. Ibrahim had her basic education in Chemical Engineering and PhD in Public Health Sciences (major- Environmental Engineering) from Alexandria University. Her professional interests focus on environmental management and hence she enjoyed sharing with well reputed international organizations (GEF, World Bank, CEDARE, JICA and UNEP) in many projects (Egyptian pollution Abatement Project, Alexandria Lake Maryut Integrated Management, Regional Environmental Management Improvement Project and MED POL Program).

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## Why scientific networks are important

Ingrid Wüning Tschol,  
Robert Bosch Foundation, Germany

“Excellent science requires excellent funding, education, infrastructure, research funding agencies and public support for science. The basis for good science in any given country is a good national science strategy and policy. This cannot be left to politicians alone. Scientists must contribute to the development and updating of such strategic plans. This requires scientists to

network and interact with scientists from other disciplines, with politicians and representatives from companies and the media. The presentation will cover several successful networking fora with a focus on science and research and their fruits.”

### Ingrid Wüning Tschol



Senior Vice President Strategic Development, Robert Bosch Stiftung, Germany. After receiving her PhD in Zoology from the University of Tübingen in 1985, Ingrid did her postdoctoral work at Massachusetts Institute of Technology (MIT), Cambridge, and State University of Stony Brook, US from 1985-1990. Further career steps include positions as Head of Molecular and Cellular Biology at Deutsche Forschungsgemeinschaft (DFG) in Bonn and Head of the European Medical Research Councils at European Science Foundation (ESF) in Strasbourg, France. She joined the Robert Bosch Foundation in 1999, first as Head of Research, since 2005 as Senior Vice President Research, and later as Senior Vice President Strategic Development. Her numerous committee activities include national and international bodies, such as the Board of Trustees (BOT) as Co-Initiator of the Next Einstein Forum (NEF), Africa; BOT Falling Walls Conference in Berlin; BOT University of Ulm; BOT Natural History Museum in Berlin, the German Museum in Munich, the African Agricultural Technology Fund (AATF) in Nairobi and Vice Chair of ERAB (European Research Area Board, advising the EU-Commissioner for Research); She is Co-Initiator of the Euroscience Open Forum

(ESOF), Member of ESOF Supervisory Board, Vice Chair/Co-Chair/ Member Steering Committees and Programme Committees of ESOF 2006-2020.

## Building bridges for science led sustainable development

Nathalie Munyampenda

Managing Director of Next Einstein Forum (NEF), Rawanda

How do we successfully move research from the lab into scalable solutions for Africa's and the world's sustainable development? How do we get scientists, especially female scientists, into decision-making positions to make the link between science and technology and national transformation? Scientists have to leverage strong networks to advocate for planned investments along the education pipeline. Beyond slogans, this keynote will shift the conversation on women in science, placing sustained and measurable commitments as critical for building the pipeline that will drive sustainable development.

### Nathalie Munyampenda



Nathalie Munyampenda is the Managing Director of Next Einstein Forum (NEF). The NEF is driving Africa's scientific agenda through the premier science and innovation conference on the continent, strategic foresight and policy work, as well organizing a coordinated Africa Science Week in over 30 countries. As part of making science more accessible, Nathalie

is also Editor-in-chief of the NEF's public magazine, Scientific African Magazine. Nathalie is also the global communications lead for the African Institute for Mathematical Sciences (AIMS) Group. AIMS believes the next Einstein will be African. Prior to joining the NEF, Nathalie worked in the Canadian public service and international social media consulting before working to build the Government of Rwanda's central communication unit as Coordinator (DG) in the Office of the Government Spokesperson.

## JST's International Strategy and Programs under Japan's S&T Diplomacy

Takako Shibata

Japan science and technology agency (JST), Japan

The nature of Science, Technology and Innovation is undergoing dynamic and rapid change. This evolution is clearly observed in the growing trend towards more open international cooperation in research and business, in the application of science and technology to multidimensional challenges that are difficult to solve by any single country or institution, as well as in the increasing circulation of exceptional talent across borders. In recently established frameworks for addressing global issues, such as the UN Sustainable Development Goals, STI are expected to make substantial contributions and provide evidence for improved policymaking. In Japan, with the increasing importance of

bridging science and diplomacy, the Foreign Minister appointed Dr. Teruo Kishi as the first Science and Technology Advisor to the Minister for Foreign Affairs in 2015. Dr. Kishi supports the activities of the Foreign Minister from the perspective of science and technology, and provides advice on the utilization of science and technology in the planning and coordination of various foreign policies. Thus, the Japanese government has been trying to promote the brand of Japanese excellent science and technology to the world and is actively encouraging international cooperation. Therefore, we, Japan Science and Technology Agency, have been implementing international programs such as the “Science and Technology Research Partnership for Sustainable Development” to expand international collaboration in education and research. We also believe in the importance of continuous discussions about how to encourage international collaborations and develop innovative human resources. In this session, I would like to introduce our international strategy and international programs.

### Takako Shibata



Ms Takako Shibata joined Japan Science and Technology Agency (JST) in October 2012 as a member of Finance Management Division, Department of Financial Affairs. From July 2017, she started working for the Department of International Affairs. She belongs to the team which develops the international strategy of JST. Now, she is chief of department of international

affairs at JST. She is in charge of the African region and one of her biggest missions is to explore opportunities to strengthen the relationship between African countries and JST. Prior to joining JST, Takako had served as a corporate sales representative at a Japanese commercial bank, where she was involved in financing loans to small and midsize companies. She graduated from Waseda University, School of International Liberal Studies.

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### Science Journalism and Science communication

Dalia Abdel Salam

Scientific American, Egypt

### Dalia Abdel-Salam



Dalia Abdel-Salam Editor in Chief Arabic Edition of Scientific American since May 2016 Dalia was the Environment and water Editor and Assistant of the Managing Director of Al Ahram Hebdo Newspaper. She is an award-winning journalist based in Cairo, Egypt. Over the past 24 years, she wrote hundreds of features on climate change, pollution, biodiversity and recycling. She is an active member in many NGO's and Media networks like the Egyptian Water Partnership, the Arab Office for Youth and Environment, the Water Media Network. Dalia was a board member of the Arab Science Journalists Association (ASJA). Dalia worked as a media consultant for national, regional and international

organizations and as an environmental reporting trainer. Since 2006, she has been acting as coordinator for Northern Africa for the African Network of Environmental Journalists (ANEJ). From July 2009 to June 2011, Dalia was acting as the Co-Director for the 7th World Conference for Science Journalists held in Doha, Qatar in 2011, a specialized conference attended by a thousand science journalists from all over the world.

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## **Grand Egyptian Museum, a flag project of collaboration between Egypt and Japan**

Osama El Nahas

Grand Egyptian Museum, Egypt

Egypt and Japan enjoy a historical relation, based on mutual respect, represented in several fields of cooperation. The cultural field occupies a very distinguished area among these fields. The Grand Egyptian museum is the biggest and most elaborated project of this coop. Since 2006, Japan has been involved in such a big cultural project not only in Egypt but also in the entire world. In this presentation, I will shed deep light into the faces of cooperation between Egypt and Japan to introduce the biggest Egyptological museum to the world and international community.

## **Osama El Nahas**



Dr. Osama El Nahas is a lecturer of Maritime and underwater Archaeology. He is currently the Supervisor of the Exhibition galleries in Grand Egyptian Museum. He was the Supervisor of the minster's technical office and the supervisor of the Central department for underwater Antiquities at the Egyptian Ministry of antiquities, and the supervisor of the underwater museum and maritime antiquities centre project in Alexandria. Previously, he has occupied several high administrative positions in the Ministry of Antiquities; such as the Director of Damietta underwater Antiquities, the Director general of the department of repatriation of Antiquities, the Director general of the department of international organizations affairs, and the department of Antiquities exhibition abroad. He obtained MA and PhD degrees in Maritime Archaeology from Catholic University of Leuven, Belgium in 2000 and 2009. In June 2014, he obtained his fellowship degree from the Nasser military academy in the field of national security and strategic planning. In 2015, he had a postdoctoral fellowship in Indiana University - USA, in the site management of underwater cultural Heritage. Dr. El Nahas has contributed to and conducted several land and underwater archaeological excavations projects that took place in Egypt. Dr El Nahas involved in several archaeological and architectural projects and courses in England, Greece, Finland, Bahrain, and Italy. He also actively participated in numerous archaeological conferences. He

also published number of articles in the field of archaeology and cultural heritage. He represented Egypt's ministry of Antiquities in the international organizations dealing with cultural heritage, such as UNESCO, EU, ICOM, ICCROM and ICOMOS.

### Seema Kumar



Vice President, Innovation, Public Health and Science Policy Communication, Johnson & Johnson. Seema is Vice President of Innovation, Global Health and Science Policy Communication for Johnson & Johnson. In this role, she drives Johnson & Johnson's reputation as a pioneer and partner of choice in innovation, research and development (R&D), and global public health. Her responsibilities include enterprise-wide communications regarding Johnson & Johnson innovation and R&D in pharmaceuticals, medical devices and consumer products, as well as medical safety and ethics, domestic and international policy affecting the sciences, and solutions for serious public health challenges. She leads communication for the Office of the Chief Scientific Officer, including the Johnson & Johnson Innovation Centers, Johnson & Johnson Global Public Health and the Office of the Chief Medical Officer. As a champion of science and innovation, STEM, global health, and mentorship for women and minorities, she is a frequent guest speaker and lecturer at international forums

### Amal Amin



The first Egyptian young scientist who attended world economic forum-Summer (WEF) DAVOS 2009, 2010-China based on the initiative of IAP to empower the young scientists worldwide. She attended and coorganized the founding workshop of global young academy (GYA) in Berlin (2010) to become one of the few active founders of GYA and its executive committee member for the following three years after foundation (GYA; 2010-2013). She was founding group leader of women in science (WIS), member in science advice group and the selection committee of GYA. Dr. Amal wrote to ASRT to establish the Egyptian young academy of sciences (EYAS) and liaised the fact finding mission of GYA to launch EYAS where ASRT responded to IAP initiative and launched EYAS (2012-2014). Therefore, Dr. Amal became co-founder and advisory board member of EYAS. Dr. Amal is associate professor at National Research Centre (NRC)-Egypt and she was group leader of the nanostructured polymers at the centre of excellence. She earned her B.Sc. in chemistry from Ain Shams University and her M.Sc. in organic chemistry from Cairo University. With a DAAD scholarship/Egypt joint fund at Ulm University-Germany/Cairo University, she earned her Ph.D. in polymer technology & catalysis. Since then, she has occupied different positions (i.e. visiting professor at nanotechnology program-faculty of engineering-Cairo University). Research stays brought her to France, USA and again to Germany for several times. She supervised and headed several

international, national projects, postgraduate students and other activities. She organized and attended numerous national, international events/conferences worldwide and carried out two memorandums of understanding between Egypt, Georgia and MTU-USA. She was the founder and president for the Egyptian society for advanced materials and nanotechnology. She has lots of scientific publications in highly ranked journals and acts as reviewer and referee in nanotechnology, polymers and nanocomposites for international journals and organizations. She got several national, international awards and was nominated to IUPAC prize for WIS (2015). Dr. Amal was selected in many scientific reputable organizations as member as in task force for Islamic young academy (IWAYS, 2014), Arab-German Young Scientists Forum (2011), New York academy of science (NY, 2014-2016), founding member of AETDEW, TWAS Young Affiliate (2010-2014), etc. She has several activities related to science education, simplified science and science communication. She attended the international IAP science communication workshop in Korea (2014) and co-organized several science days with EYAS along Egyptian governorates to enhance public science literacy. She shared in developing global civics courses in the Arab region and was selected to attend world science forum 2015&2017 (moderator of WIS sessions and speaker). She was selected for AAAS-TWAS science diplomacy course (Italy, 2016). Dr. Amal represented GYA in 2nd INGSA-EU conference on science policy making (Belgium, 2016). Dr. Amal participated in mentorship programs of NYA, GYA, three

circles of Alemate for WIS and attended AAAS annual meeting in Boston (2017). Dr. Amal is the founding chair of the conference/initiative for women in science without borders (WISWB) where the first conference was held in Cairo, (March, 2017) and the 2nd WISWB was held in South Africa (March 2018). Dr. Amal was invited to tens of high level reputable meetings as TWAS-TYAN conference (Brazil, 2017, science diplomacy), NASAC international forum on women and sustainable development (Tanzania, 2018), youth employment (Turkey, 2018), renewable energy (Argentine, 2018), INGSA (Japan, 2018), Globlics (Ghana, 2018), etc. Dr. Amal achievements were featured in women in science-inspiring stories from Africa (NASAC-IAP-2017), SAYAS Success stories of young scientists (2016) and others.

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3<sup>RD</sup> INTERNATIONAL CONFERENCE FOR WOMEN IN SCIENCE NETWORK

WORLD FORUM FOR WOMEN IN SCIENCE

## Track 7: Innovation Map

## Track 7: Innovation Map

### Roles of the University, Private and Public Sectors Towards Innovation and Entrepreneurship on the Arab Scene

Ghada Amer  
Arab Science and Technology Foundation

Power Electrical Engineering, Benha University, Egypt

#### Ghada M. Amer



Ghada Amer, Professor of Electrical Engineer, is the Vice President the Arab Science and Technology Foundation (ASTF). She holds few more positions within her profession, like the Head of Electrical Engineering Department at Benha University and the CEO of the Global Awqaf Research Center (GARC). Also because she believe on the important of R&D for her community (not only in Egypt, but in all Arab countries) she create an entity for research and training called AccuTraining, which based on UAE. She was names in Jan 2014 as one of "Top 20 Influential Muslim Women Scientist in the World", by an international committee residing on Muslim-Science, as an emerging champion "power woman". Also she ranked the first

place for the 50 most prominent leader of the Arab woman in 2014 issued by the Sayidaty magazine Born in Manama, Bahrain, 1972, a Chess Champion, 1986-1990 in Kuwait., she lead many student activities and was awarded "Best Leader for Student Activity Award", 2006 at Benha University. And, she was named as a best leader on 2002 by the Egyptian national "Institute for Leadership Development". She received her training on Control and Instrumentation in Electrical Engineering (B.Sc. 1995), Electrical Power Engineering (M.Sc., 1999) and PhD. degree in Electrical Power Engineering from faculty of engineering, Cairo University, 2002. She served as a lecturer (1996 till present), a head of department (2007-2010 and 2013 till present) and an S&T Advisor (2008-2010). On her academic career, she served as member of scientific committees, chairman and editor of many regional and international scientific conferences. Beside, being an editor of two international journals on her field of specialty. She received "Best Research Paper Award" CATAEE Conference, Jordan, 2004. She is an active member of the main committee of the Egyptian Engineering Syndicate. Her present research interests are the protection system, power system, high voltage engineering, effect of EMF of high voltage transmission lines, and biomedical engineering. Internationally, Ghada is active on scientific collaboration she became a member of Third World Organization for Women in Science TWOWS 2008, and a member of the organizing committee (2011) for "Arab-American Frontiers of Science,

Engineering and Medicine” symposium that is organized by the Kuwait Institute for Scientific Research (KISR) and the US National Academies. She, actively, participates in many collaborative programs. Ghada Amer is active advocate for socio-economic development that is based on RDI within her country and the region. She worked as a volunteer with the Arab Science and Technology Foundation (ASTF) and later joined as the Manager for Women Programs. For her active participation, she was elected as a member of the Board of Directors (2011) then the VP of the Foundation (2012 till present). Within her involvement with the ASTF, she developed and led more than 20 projects and programs to support scientific development and entrepreneurship. -For more information please check the following links

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## Useful and Effective Applications of Nanotechnology in Water, Food & Medicine

Hanan Malkawi

Department of Biological Sciences-Yarmouk University, Jordan

### Hanan Issa Malkawi



Jordan. Prof. Hanan I. Malkawi has earned

Prof. Hanan Malkawi holds PhD. Microbiology & Molecular Biology, Professor at Department of Biological Sciences-Yarmouk University-

her bachelor degree in Biological Sciences at Yarmouk University (YU)-Jordan, and then she was offered a scholarship from YU to get her M.Sc in Bacteriology & Public and then PhD degree in Microbiology & Molecular Biology both at Washington State University-USA, after which she returned to Jordan and appointed as professor at Yarmouk University. She has been heavily involved in research lines in biotechnology and their applications in environment, health, agriculture, microbiology, food & industry. She has been also involved in several projects in education and higher education and linking academia with industry. She has several funded grants from national & international agencies. She served as the European Commission’s Higher Education Reform Expert (HEREs) for Jordan. Prof. Hanan is known for her devoted efforts in helping and inspiring young Jordanian scientists, and entrepreneurs, especially women, to pursue their graduate studies and research and build a career by assisting them with advice, mentorship and coaching and providing them with guidance and feedback and engaging them with society and introducing them to people and organizations. She registered several patents and has over 70 published papers in peer reviewed international scientific journals and outstanding teaching and supervision activities at both the undergraduate and graduate levels. She has & still been invited as speaker and member of Steering/organizing committees in numerous International Congresses, Symposia and Forums and participated and gave talks in more than 100 conferences and workshops world-wide.

She received several awards and fellowships and is an active member in several national, regional and international committees, associations & organizations. Prof. Malkawi has held several administrative positions: Vice President for Science Engagement at Royal Scientific Society-Jordan, Vice President for Research & Int. Relations at YU, Dean of Scientific Research & Graduate Studies at YU, Director of UNESCO Chair for Desert Studies at YU, Director of Foreign Projects Management Unit at YU, Director of Center of Excellence for Jordanian Public University Libraries at YU, Vice-Dean of Faculty of Sciences at YU. In addition, she served as Dean for Research & Doctoral studies at "Hamdan Bin Mohammad Smart University", Dubai-UAE, where she gained an excellent experience in e-learning environment, smart excellence education and applications.

## Value creation within biotech startups from human, scientific & financial perspective

Abdelaziz Yasri

OriBase Pharma

Agroresources Valorization Laboratory at Mohammed VI University, Morocco

### Abdelaziz Yasri



Prof. Abdelaziz Yasri, holds a PhD in Biophysics and Drug Sciences from Montpellier Medical School in France and

also an MBA at Montpellier Business School. He is now a full professor at Mohammed VI Polytechnic University in Morocco. He has created and he is heading the BioMolecules and Medicinal Plants for Drug Discovery Laboratory. He is currently creating High School in Biotechnology and Life Sciences within Mohammed VI Polytechnic University. Dr A. Yasri has more than 23 years of experience in academia, in start-ups, biotechnology and pharmaceutical industry and within management and business development. He joined the team of Synt:em (start-up in Nîmes, France) as a Senior Scientist to participate in all the development stages of the company whose growth was characterized by a transition from 5 to 35 employees in 3 years. His management experience and drug discovery expertise was developed within ArQule Inc. (USA) and in Johnson & Johnson Pharmaceutical Research & Development (Belgium). Dr A. Yasri was one of the founders of Nova Decision Company where he occupied the position of CEO from September 2007 to April 2016. He achieved the merger of Nova Decision and Azasynth companies by founding OriBase Pharma. He also acted as Chief Scientific Officer at OriBase Pharma. Dr A. Yasri has also founded NacymCare Pharma in Morocco and co-founded Aljaber Therapeutics in UEA. Dr A. Yasri is the founder and president of the Moroccan Society of Therapeutical Chemistry and member of the board of Arab Science and Technology Foundation. Dr A. Yasri holds more than 25 peer reviewed scientific papers published at international journals and 9 international patents in the field of Pharmaceutical R&D and Biotechnology applied to human

health, cosmetics cosmetoceutics and nutraceutics. He is now directing the Agro-ressources valorization Laboratory at the Mohammed VI Polytechnic University in Morocco.

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## Open Innovation in Life Sciences: from Theory to Industrial Implementation

Mohamed Haitham Ayad

Johnson & Johnson, Dubai, UAE

The dramatic reduction of pharmaceutical R&D efficiency over time resulted in only 16% of drug candidates entering clinical testing make it to regulatory approval, at an overall cost estimated approximately at \$2.6 Billion. The traditional “All in house” business model is no more the dominant way for discovering new innovative products as 70% of the pharmaceutical industry’s new sales today come from drugs originated from the Open Innovation model. Naturally, this multipart innovation model created new complexity and challenges that need to be addressed for efficient collaboration. This Paper explains the Open Innovation model, the benefits for both Industry and Academia and explains the steps and criteria of establishing a successful collaboration. It is becoming universally acceptable that working in Open Innovation collaborative model is a key success factor to meet the global health challenges as no single organization, private or public, will be able to face them alone.

## Mohamad Haitham Ayad



Mohamad Haitham Ayad is a State Registered Pharmacist from the University of Damascus, Syria. He holds a Master’s Degree in Pharmaceutical Technology from the

University of Bordeaux, France. Working several years in different pharmaceutical companies in technical research and development, he gained substantial broad experience in Drug Delivery and Formulation Development of oral dosage forms from early preclinical stage to late commercial scale production. Currently, Dr. Ayad is working at Johnson & Johnson, Dubai, as R&D Manager & Fellow- Support to Marketed Products. He is in charge of technology transfer of commercialized products and supporting their manufacturing. In addition, he is Innovation Ambassador for London Innovation Center to scout external opportunities in MENA region. Before Joining J&J, he worked for several pharmaceutical companies in Switzerland and in France where he was in charge of the development projects of oral dosage forms from the preformulation stage until the scale-up at manufacturing location. Dr. Ayad filed three patents and published three Research Articles in the field of Formulation Science. In addition, he was invited speaker in several international conferences in the Pharmaceutical Development and Innovation fields.

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## Higher Education and scientific research in the Arab World

Sultan Abu Orabi,

Association of Arab Universities, Jordan

### Sultan Abu-Orabi



Professor Sultan T. Abu-Orabi Aladwan is the Secretary General of the Association of Arab Universities (AARU) also known as the Union of Arab Universities. The AARU is an organization working within the framework of the Arab League established with the mission of "Assisting and coordinating the efforts of Arab Universities to prepare capable persons who can serve their Arab communities and preserve its unified culture and civilization, as well as to assist in developing its natural resources." Today, the association involves 240 Arab Universities from the different Arab countries. He was also the Former President of Yarmouk University in Jordan and was previously the president of Irbid National University from 2002 – 2005. In addition, Professor Sultan acts as both the President of the Jordanian Chemical Society and the Secretary General of the Arab Union of Chemists. Previously, he was a Visiting Professor at Bahrain University and the King Fahd University of Petroleum and Minerals, Saudi Arabia.

With a PhD in Organic Chemistry from the University of Michigan in the USA, Professor Orabi remains an active researcher and scholar who throughout the years have published over 55 journal research papers, 5 book reviews and participated in over 90 conferences at the national, regional and international levels. He is the editor in chief several journals and has served on many International Advisory Boards, and acted as Chair or member of the Scientific and Organization Committees.

Professor Sultan received several honors, awards and grants including the "Jewels of the Muslim World" Award for 'Top Movers of the Islamic Economics', presented during the 2nd Muslim World Biz Conference, June 2011; the "Badge of Honor Medal" presented by the International Scientific Partnership Foundation in Russia, for the Development of Science in Jordan and Arab countries and International Collaboration, 2007 and the Distinguished Achievement Alumni Award, Western Michigan University, in 2004 among others.

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