



# INTERNATIONAL SOCIETY ON TOXINOLOGY

## NEWSLETTER

September 2009

### UPCOMING MEETINGS

#### **Pan-American Section IST**

Hotel Real International, San Jose, in Costa Rica, April 18-22, 2010. Details available, both on the IST website and on a site for this Congress, at [panamist.icp.ucr.ac.cr](http://panamist.icp.ucr.ac.cr). The contact person for this meeting is Prof. Gutierrez, [JOSE.GUTIERREZ@ucr.ac.cr](mailto:JOSE.GUTIERREZ@ucr.ac.cr).

#### **Asia-Pacific Section IST**

Vladivostok, Russia, in September 2011, details pending.

#### **European Section IST**

Valencia, Spain, details pending

#### **IST World Congress**

Hawaii, 2012, details pending.

**8th Australian Peptide Conference.** Oct. 11-16, and **1st International Conference on Circular Proteins**, Oct. 18-21, both on Heron Island.

**French Society on Toxinology 17th Meeting.** December 2-3, 2009, Paris. Contact [fgoudey@noos.fr](mailto:fgoudey@noos.fr).

**Recent Advances in Snake Venom Research and Snake Bite Therapy.** Tezpur University, India, December 18-19, 2009. Contact [doley@tezu.ernet.in](mailto:doley@tezu.ernet.in)

**The NP2D (Natural Peptides to Drugs,** <http://www.np2d.com>) congress will take place in Zermatt (Switzerland) from April 11th to 14th, 2010. For further information, contact Dr. Reto Stocklin at [reto.stocklin@atheris.ch](mailto:reto.stocklin@atheris.ch).

### FROM THE IST EXECUTIVE

This is the second of the IST's new electronic format, email distributed newsletters. I welcome feedback from IST members on what they want to see included (and excluded) in future newsletters. I also welcome items from IST members for inclusion in the newsletter. This should become an easy way for members to communicate to the whole membership, on matters of toxinologic interest, such as upcoming meetings, legislative and government changes affecting toxinology, and broad views of research developments. However, the newsletter is not for announcing research findings; that remains the realm of peer reviewed publications, especially *Toxicon*. All members should remember that *Toxicon* was founded by the IST and although it is managed by Elsevier, as the current publisher, it is still the official journal of the Society and welcomes submission of toxin-related papers from IST members and others. Wherever practical, try and offer your papers to *Toxicon* for publication. *Toxicon* continues to improve it's impact factor and general standing. It is in all our interests that this trend continue.

While there are no further IST meetings planned for 2009, the Pan-American Section meeting is in April next year, so start planning for that now. Also there are a number of toxinology-related meetings scheduled in the next 6 months or so. Look for information on these in this Newsletter and on the IST website ([www.toxinology.org](http://www.toxinology.org)). There are also some research position/job offers in toxinology and some articles and book reviews in this edition. Also, do you, the membership, want a "letters" section in the Newsletter? Let me know. Keep material coming please!

Julian White, Secretary/Treasurer, IST

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## MEMBERSHIP ANNOUNCEMENTS

The IST Membership Database has been updated, a process that will be ongoing. Please let the IST Secretary know if you change any of your contact details (email, phone, address etc). It is hoped that the Membership Database can be made available to all IST members via the IST website, with password protection for access.

Because of file size, the Newsletter may be too big for some member's email accounts and so it may be more practical to post the Newsletter on the IST website and just email members advising it is ready to download, via a link.

Last Newsletter I raised the issue of access to email address-

es by non IST members. Members may prefer to keep email addresses more secure, using the new membership online database, once this is operational, rather than list addresses in the publicly accessible Newsletter. As IST Secretary, I will take direction from the membership on this issue and will not include members email addresses in the Newsletter until and unless it is clear that is what most members want. So far, though, IST members have not told me what they want regarding this matter.

Julian White  
Secretary/Treasurer IST

### IST STUDENT MEMBERS - THIS IS FOR YOU - ACTION PLEASE!

#### An announcement for the formation of a Special Interest Group for Student Toxinologists

Students have been an important and valued part of IST since the inception of the Society in 1962. To emphasize the importance of the role of students in the IST, the creation of a Special Interest Group for Student Toxinologists has been proposed.

The aims of the Special Interest Group for Student Toxinologists would include: to increase opportunities for students to network with possible collaborators and employers; to work with the Executive and Council, IST to ensure students are included and supported in future decisions of the IST; and to train students to become contributing members to the IST and other professional societies.

The IST is looking for student members interested in being a part of such a network, and for those students (preferably with experience with other organizations) who would like to be considered for leadership positions. Any students interested in participating in such a network should contact the following by email (please send your email to the Secretary, IST, with cc to the President, IST and to student member Maggie Gentz):

julian.white@adelaide.edu.au  
antgopal@nus.edu.sg  
m.gentz@uq.edu.au

### IST Council 2009-2012

President: P Gopalakrishnakone  
Secretary/Treasurer: J White  
President Elect: A Harvey  
Toxicology Editor: A Harvey  
President European Section: J Tytgat  
Secretary European Section: I Krizaj  
President Pan-American Section: JM Gutierrez  
Secretary Pan-American Section: B Lomonte  
President Asia-Pacific Section: E Grishin  
Secretary Asia-Pacific Section: vacant  
General Councillors  
Y Cury (Brazil)  
L Possani (Mexico)  
B Olivera (USA)  
D Mebs (Germany)  
G Nicholson (Australia)

### THE FUTURE OF THE IST NEWSLETTER

The IST Newsletter needs input from IST members to make it a more effective communication tool within the Society. The move to electronic format may open up opportunities for new sections. For instance, it might be possible to have annotated bibliographies of recent toxinology publications from other journals, or reports of other meetings with toxinology content. Available toxinology-related jobs and student postings could be listed. There are doubtless many other possibilities members may think of.

So I ask all IST members to consider what they want from the Newsletter and let me know by email. I also want to hear from IST members prepared to contribute regular sections to the Newsletter. To be vibrant and relevant the Newsletter must become more than just a brief report on IST business by myself and our President, but that requires your input.

Julian White  
Secretary/Treasurer IST  
julian.white@adelaide.edu.au

## MESSAGE FROM THE PRESIDENT (I.S.T)



Dear Fellow Toxinologists and Friends,

This is the 2nd News Letter (Electronic) from the IST. I hope you enjoyed the previous one and there were some feedback but we like to have more interaction and contributions from each and every member.

The Nomenclature committee has been officially formed and they have started working under the guidance of Prof. Glenn King of Australia.

Global snake bite initiative is taking shape and the first task of publishing a letter in Lancet is underway and this will appear very soon.

I also urge the members to recruit more new members and

this should be also the main responsibility of the council members. Any member who recruit more than 6-10 new members per year will be recognised at the World Congress with a token of appreciation.

It will be good idea if our members could write a brief note about their laboratories and the type of research they are doing as well as available positions for research etc and this will be published in the news letter.

National Organisations which deal with toxin research as well as clinical Toxinology are encouraged to get in touch with us so that they could be affiliated to IST under certain conditions to the benefit of both parties

Prof P Gopalakrishnakone  
President of the IST (2009-2012)  
Email: [antgopal@nus.edu.sg](mailto:antgopal@nus.edu.sg)

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### **IST Nomenclature Committee**

At the last IST World Congress held in Recife, Brazil in March 2009, a symposium devoted to the topic of toxin nomenclature received significant interest from IST members. The IST Council subsequently decided to form a nomenclature committee to examine the issue of toxin naming standards and recommend possible solutions. The mandate of this committee is to propose a nomenclature system, with interim reports to IST Council and a "final" report to be delivered at the IST World Congress in 2012.

If you have any comments or suggestions on toxin nomenclature, could you please send them to a member of the nomenclature committee, which is currently comprised of the following members:

- Dr Gerardo Corzo, Mexico (Email: [corzo@ibt.unam.mx](mailto:corzo@ibt.unam.mx))
- Dr Florence Jungo, Switzerland (Email: [Florence.Jungo@isb-sib.ch](mailto:Florence.Jungo@isb-sib.ch))
- Dr Evanguedes Kalapothakis, Brazil (Email: [ekalapo@icb.ufmg.br](mailto:ekalapo@icb.ufmg.br))
- Prof. Glenn King, Australia (Chairman; Email: [glenn.king@imb.uq.edu.au](mailto:glenn.king@imb.uq.edu.au))
- Prof. Manjunatha Kini, Singapore (Email: [dbskinim@nus.edu.sg](mailto:dbskinim@nus.edu.sg))
- Prof. Graham Nicholson, Australia (Email: [graham.nicholson@uts.edu.au](mailto:graham.nicholson@uts.edu.au))
- Prof. Toto Olivera, USA (Email: [olivera@biology.utah.edu](mailto:olivera@biology.utah.edu))
- Prof. Jan Tytgat, Belgium (Email: [jan.tytgat@pharm.kuleuven.be](mailto:jan.tytgat@pharm.kuleuven.be))

### **ArachnoServer spider toxin database**

ArachnoServer is a manually curated database that provides detailed information about proteinaceous toxins from spiders. Key features of ArachnoServer include a new molecular target ontology designed especially for venom toxins, the most up-to-date taxonomic information available, and a powerful advanced search interface. Toxin information can be browsed through dynamic trees, and each toxin has a dedicated page summarising all available information about its sequence, structure, and biological activity. ArachnoServer currently manages 567 protein sequences, 334 nucleic acid sequences, and 51 protein structures. ArachnoServer is available online at [www.arachnoserver.org](http://www.arachnoserver.org).

**LETTERS SECTION**

Dear IST members,

We have been keen on working with photooxidised venom product (POVP) from snake venoms. We have generated them by UV radiation exposure in the presence of sensitizer dye, methylene blue (1). These products generated by photochemical oxidative reactions, lost their lethality however, retained the pharmacological activity of therapeutic significance. POVP of Russell's viper venom showed analgesic, antiinflammatory, coagulant, cardiac stimulant and sedative depression properties (2). POVP of saw scaled viper venom showed antidepressant and antidementia properties (3) whereas POVP of beaked sea snake showed CNS stimulant, analgesic, anticoagulant properties (4). POVP of *Vipera russelli* has complied with acute and subacute toxicity test and the product was viable for the period of 3 months at refrigerated temperature. We are aiming to evaluate these products further in extended pharmacological studies and viability studies. As a natural nonherbal therapeutic alternatives (NNTAs), these products will be formulated as a parenteral preparation. The word venomoid has been used for de venomated snakes. In the letter to the editor in *JVATiTD*, Brazil (5), we have suggested to name POVP as a "snake venomoid" and "snakoid" for de venomated snakes. As venom after photochemical treatment loses its lethality, it is suggested to name the photooxidised snake venom product as a "snake venomoid." Your valuable suggestions will be highly informative before practicing this term for the pharmaceutical research.

References :

1. Gawade S.P.( 2000) : *J.Venom Anim Toxins* 2,6:271-280.
2. Gawade S.P. and Sankar A. (2007) : *Indian J.Pharm.Edu. Res.*, 41:121-128.
3. Reddy C.M. and Gawade S.P. (2006) : *JVATiTD*, 12(4), 632-652.
4. Gawade S.P.(2007) : *Indian J.Pharmacology*, 39 (6), 260-264.
5. Gawade S.P. (2007) : Letter to the Editor *JVATiTD*, 13:430.

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Gourishankar Education Society's  
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**POSITIONS ON OFFER**

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**UNIVERSITÄT  
BERN**

Institute of Ecology and Evolution, Community Ecology, Baltzerstrasse 6, CH 3012 Bern

Science Faculty  
Department of Biology  
Institute of Ecology and Evolution  
**Community Ecology**

Bern, 22 September 2009

**Ph.D. Position**  
**Structure and function of spider venom and immune system**

In the group of Community Ecology at the Institute of Ecology and Evolution of the University of Bern a Ph.D. student position is available to study structure and function of spider venom and immune system.

This position requires a recent diploma or master degree in biology, biochemistry, molecular biology or an equivalent degree. Experience with some techniques in molecular biology or biochemistry is necessary, e.g. HPLC, SDS PAGE, PCR, cDNA library construction, cloning, bioinformatics. This position also includes some maintenance work of the spider breeding stock.

Start of the position is by 1. November 2009 or by arrangement. The salary is according to the remuneration for Ph.D. students of the Swiss National Science Foundation. Duration of the project is 3 years.

Please send your complete application prior to 15. October 2009 to Prof. Dr. Wolfgang Nentwig as e-mail attachment (PDF, all documents in one file) to [wolfgang.nentwig@iee.unibe.ch](mailto:wolfgang.nentwig@iee.unibe.ch). Additional information is available per e-Mail or can be found on our web site.

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[www.zoology.unibe.ch/ecol](http://www.zoology.unibe.ch/ecol)

## POSITIONS ON OFFER

### **M.Sc and Ph.D. program in Toxinology at Butantan Institute**

Butantan Institute will open in 2010 its first course awarding both Master (M.Sc) and Doctoral (Ph.D.) degrees. These courses were highly-ranked by CAPES (the Brazilian government agency regulating both under- and graduate schools), an outstanding start for a new course!

The program, termed Toxinology, will feature a multidisciplinary approach on venoms and toxins (from the most diverse origins) and their effects on biological systems (observed from different perspectives).

Toxinology diversity will make it possible that the graduate professional works either on basic research (Universities, Government, and Research Institutes) or applied sciences (R&D, Pharma & Biotech).

Subjects:

Toxins e Biological Systems  
Structural Toxinology  
Envenomation and Therapeutics  
Bioprospection and Development

Courses begin on March, 2010, and applications will be held from Jan 4 to 22, 2010.

Further details available at: [www.butantan.gov.br/posgrad](http://www.butantan.gov.br/posgrad) or by e.mail: [cpgibu@butantan.gov.br](mailto:cpgibu@butantan.gov.br)

### **Envenomation Medicine Fellowship**

Fellowship Director: Sean Bush, MD, FACEP

Institution: Loma Linda University School of Medicine

Address: 11234 Anderson Street, Room A108

Loma Linda, CA 92354 USA

Phone: (909) 558-4344

Fax: (909) 558-0121

E-mail: [sbush@llu.edu](mailto:sbush@llu.edu)

Fellowship Length: 1 year

Number of Positions: 1

Salary: Approximately \$76,000

Shifts/hours per week: 16

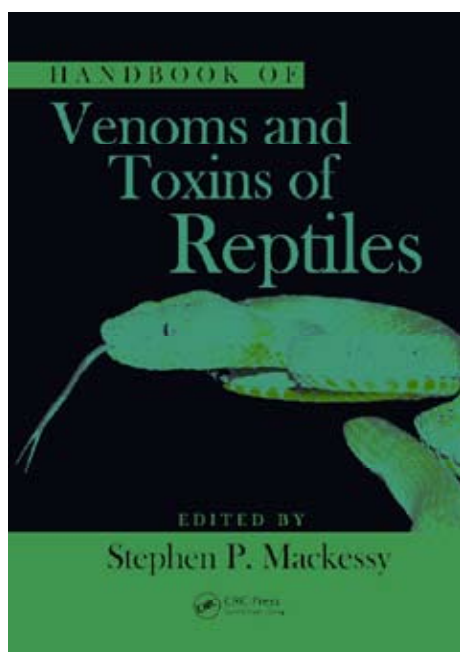
Advanced Degree: MD or DO, with successful completion of an Emergency Medicine residency

Deadline for Applications: November 21

The Envenomation Medicine Fellowship at Loma Linda University Medical Center is designed to provide non-ACGME, sub-specialty training in medical management of venomous bites and stings.



## NEW TOXINOLOGY BOOKS



## HANDBOOK OF VENOMS AND TOXINS OF REPTILES

**Editor Stephen P Mackessy**

Reptile venoms and toxins have a potential for tremendous contribution to treatment of human diseases, and some of this potential has been realized in the production of drugs based on or modeled from venom toxins. These non-human combinatorial chemists have (teleologically speaking) usurped many regulatory compounds from various physiological processes, turning them against their prey at concentrations orders of magnitude greater than normal. It is therefore not surprising that reptile venoms contain toxins which can be directed against human cancers, hemostatic disorders and even diabetes. Further, because many toxins interact with receptors/ligands with a high degree of specificity, they are also an excellent source of novel drug leads and design.

Handbook of Venoms and Toxins of Reptiles provides an overview of the biology of venomous reptiles, biochemistry and molecular biology of venoms and venom components, and effects and treatment of human envenomations. The 24 chapters included in this volume are written by experts from 12 countries world-wide, giving the book both a broad perspective and international relevance. Unlike previous books addressing venoms, this volume bridges several very divergent areas in modern biology and provides a synthesis of current knowledge about venoms and venomous reptiles. Many figures are included, and the Handbook presents a broad view of reptile toxinology, from the actual animal to the glands producing venoms to molecular models and mechanisms of action of the toxins themselves.

Published 14 July 2009, this book is available from CRC Press or various book sales outlets such as Amazon.com.

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## NEW TOXINOLOGY BOOKS

Reprinted with permission from: J. Venom. Anim. Toxins incl. Trop. Dis.  
Book review - ISSN 1678-9199.

### ANIMAL TOXINS: STATE OF THE ART - PERSPECTIVES IN HEALTH AND BIOTECHNOLOGY

Organizers: Maria Elena de Lima, Adriano Monteiro de Castro Pimenta, Marie France Martin-Eau-claire, Russolina Benedeta Zingali and Hervé Rochat.

Editora UFMG, 2009, 800 p., ISBN: 978-85-7041-735-0.

This single-volume edition presents for the first time results of several studies with different perspectives on the real possibilities of the use of animal venoms and toxins in the biotechnology industry. Animal Toxins consists of 39 articles, signed by renowned experts of various nationalities. The state of the art in compounds derived from venoms of marine animals, spiders and scorpions, lizards, snakes, among others, are the focus of this publication which aims to meet scientists, students and university researchers, biotechnologists interested in toxicology as well as the pharmaceutical industry. Animal venoms and toxins have been selected over millions of years of evolution to act quickly and effectively on the victim body, which results in a massive repertoire of molecules able to bind to specific targets. The possibility of using these toxins in biotechnological processes means that these venoms and toxins are regarded as one of the most promising sources of bioactive natural compounds.



FINANCIAL SOURCE: Fapemig, Fundep, INCTT (Instituto Nacional de Ciência e Tecnologia em Toxinas).

#### CORRESPONDENCE TO:

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## BOOK REVIEW

### Book Review. Practising Clinical Toxinology in a remote and unforgiving terrain.

**Robert J MacCabe. Desert Nomads. A Study of the Pattern of Health and Disease of the Turkana People of North Western Kenya. Dublin, Irish Carmelites Publishing, 2009.**

Lake Turkana, named after the predominant local pastoralist tribe, stretches north from north-western Kenya into Ethiopia. It gained a certain notoriety from "Eyelids of Morning" (New York Graphic Society, A&W Visual Library, 1973), an outrageous potpourri of images and words about its resident crocodiles, and the marvellous movie of John Le Carré's "The Constant Gardener" (2005) which revealed the dramatic beauty of this remote and arid region. Palaeontologically, the lake basin is famous for discoveries of many fossil hominids, most notably the 1.5 million-year-old "Turkana boy" (Homo erectus or H. ergaster) found by Richard Leakey's team in 1984.

Father Doctor Robbie MacCabe is an Irish Carmelite medical missionary who has lived in Turkana since 1977. His book "Desert Nomads" is a marvellous mixture of autobiography and an-

thropology with cultural and geographical elements as well as a mass of clinical information. As in most tropical developing countries, the traditional healers, known as “emurons” and “ekapilans” (witch doctors) are respected greatly by the Turkana people. But their time-wasting and frequently injurious remedies must be opposed by practitioners of Western-style scientific medicine. Father Robbie’s main strategy for providing the largely nomadic Turkana with access to medical care has been to take a mobile clinic (bicycle or Land Rover) (Fig-1) to their habitual watering places, deep in the interior desert regions away from The Lake.

During his time in Turkana, and the preceding 16 years in Southern Rhodesia (Zimbabwe), Father Robbie has seen a lot of snake bite. Clinical toxinologists will be particularly interested in Chapter 12 “Animals hazardous to humans”. In Zimbabwe, his patients were bitten by spitting cobras (*Naja mossambica*) (images page 123) and in Turkana, by saw-scaled vipers (*Echis pyramidum*) (images page 123-4) and spitting cobras (*Naja pallida*). Although *E. pyramidum* causes most snake bite deaths in this region, the Turkana fear Ruppell’s agama lizard (*Agama ruppelli*) even more. Perhaps Bryan Grieg Fry should turn his attention to this species. Father Robbie has struggled to supply scarce but highly effective antivenom to the Turkana (Fig-2), but children and adults continue to die in northern Kenya for want of this essential drug. Anyone who doubts the terrible impact of snake bite on Africa’s children should examine the images on pages 123 and 124. In the hardy Turkana, bites by solifugid “wind scorpions”, “camel spiders” or “sun spiders”, which have terrorised coalition forces in Iraq, produce dramatic symptoms including stupor, dribbling of profuse stringy saliva and choreoathetoid hand movements that may persist for two days. However, as Father Robbie’s own laboratory studies have proved, these arthropods possess neither venom nor venom apparatus. So how can he profess that “It is not a hysterical reaction”? An image on page 111, shows an *E. pyramidum* swallowing a solifugid. This is of interest in view of the recent paper on the invertebrate diet of *Echis* (Barlow et al., *Coevolution of diet and prey-specific venom activity supports the role of selection in snake venom evolution*. *Proc Biol Sci.* 2009 Jul 7;276(1666):2443-9). Probably his most intriguing image is labelled “spider bite” (page 126): a young girl, dazed and with obvious bilateral ptosis and external ophthalmoplegia. What on earth could have been the cause?

Added to Father Robbie’s evocative descriptions, the great strength of this book is its many original colour photographs. Scenic shots immediately dispel one disparaging view of the region as a “horizonless frying pan of desolation”. As well as desert, savannah and acacia scrub, we see mountains, passes, waddies (dried up river beds) in the throes of their annual flash floods, storms, wild flowers, the blue lake, wild life and, above all, delightful indigenous people. Father Robbie, whom I have known since the 1970s, provides unique care and ministry to a threatened nomadic population. Their needs have been largely ignored by the Kenyan authorities. “Desert Nomads” provides us with a rare opportunity to view, appreciate and commend one man’s mission.

David A. Warrell  
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University of Oxford, UK  
September 2009

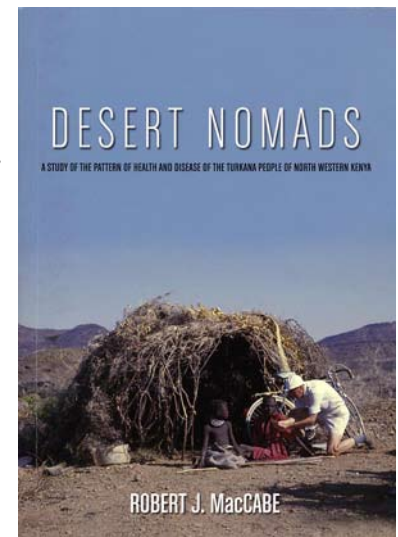


Fig-1 (Book cover) Mobile clinic in Turkana

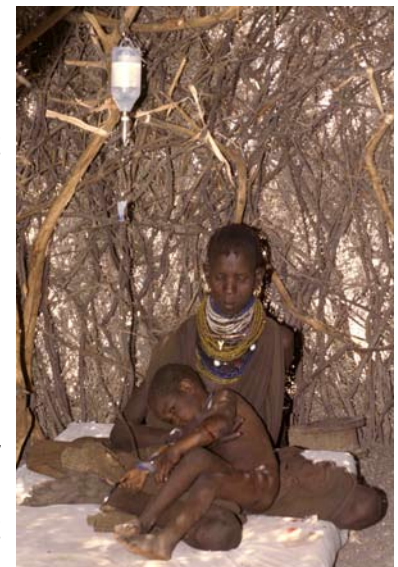


Fig-2 Antivenom administration by Father Robbie in a Turkana hut. The 2-year-old girl had been bitten on the left hand by an *Echis pyramidum*.

## The Global Snakebite Initiative

### Background

This important project is the first major undertaking resulting from the ***Global Issues in Clinical Toxinology Conference***, held in Melbourne, Australia, November 2008. At this meeting, attended by stakeholders from all continents (except Antarctica), a steering committee was formed to move towards solutions for envenomed patients Worldwide. It was considered by this meeting, attended by some senior IST members, that this process would best be promoted by close association with the IST, as a project under the IST banner. At the Asia-Pacific Section Congress in Vietnam in December 2008, a proposal was made by Prof. David Warrell, seconded by Prof. P Gopalakrishnakone (IST President), that "The Global Snakebite Initiative be formally endorsed as an official initiative of the IST." This was passed unanimously and confirmed unanimously at the IST World Congress in Recife, Brazil, March 2009. This important initiative is now officially a project of the IST. The Steering Committee, which contains a number of IST members, will produce a work plan and timeline to present to all IST members. A new website to promote the Initiative has been launched at [www.snakebiteinitiative.org](http://www.snakebiteinitiative.org) and it is to be hoped that this will progress to a major resource for the Initiative.

### Global Snakebite Statistics

Recent research by Kasturiaratne et al, published in PLoS, has redefined global estimates of snakebite epidemiology. However, this is, to some extent, a "work in progress". One of the authors, Prof. Janaka de Silva (Sri Lanka) has kindly made available some of the data tables on which the study conclusions were based, with a "challenge" to IST members (and others) to provide more definitive data for each listed country. These tables will be listed on a separate page structure for the IST website ([www.toxinology.org](http://www.toxinology.org)). All interested members are urged to peruse this information and contact Prof. de Silva if they have additional data that might be used to update the tables. This work may be considered as one section of the Global Snakebite Initiative.

### An Update

#### 1. The Lancet Paper

This is in press and should be published within the next 4-6 weeks. The paper sets out a vision for how several of the GSI founders (DJW, JMG, JW, RH,

DAW, PG and KDW) see GSI evolving from a concept into a functional model for approaching snakebite in a wholistic manner. Our success in having the paper accepted by the Lancet will ensure that the issue receives wide coverage, and will, we hope, interest potential contributors and collaborators from diverse fields in public health and medicine.

#### 2. GSI Website (<http://www.snakebiteinitiative.org>)

A working template for the website was developed by Melbourne Business School MBA graduate Ms Cynthia Win, and has been further adapted to give examples of how the site can be used to publicise snake bite projects, issues, problems and challenges in many different parts of the world. At the moment we use examples from Bangladesh, Nigeria, Swaziland, PNG and Cambodia to show the different approaches that can be taken in presenting information on the website. We would welcome constructive suggestions on improving the site, and are particularly eager to have toxinologists from countries to take up roles as "country coordinators" - collating information, statistics, human stories, imagery and other content from their countries, and taking on the task of submitting, editing and updating this information via individual country pages. For more information they can contact David Williams: [toxinologist@hotmail.com](mailto:toxinologist@hotmail.com)

#### 3. GSI Special Topics Groups

At the IST World Congress in Recife, Brazil, it was agreed that work would be carried out to develop GSI consensus statements on particular issues relating to the treatment of snakebite. The first topics to be considered were:

- regional snake bite first aid recommendations
- local and regional (tissue) injury caused by snake bite
- regional practice guidelines development

We would like to invite interested persons to volunteer their time to participate in one or more of these groups. The aim is to consider all of the available information and develop a concise GSI policy statement/guideline for dissemination via the website and other publications. Those interested should communicate with Drs Simon Jensen ([simondjensen@hotmail.com](mailto:simondjensen@hotmail.com)) and Julian White ([julian.white@adelaide.edu.au](mailto:julian.white@adelaide.edu.au)) to register their interest.

*David Williams on behalf of GSI*

## The Clinical Toxinology Initiative

The issue of specialist-level training for medical doctors, in the field of clinical toxinology, and credentialing of such training, was canvassed at the Global Issues in Clinical Toxinology Conference and again, through presentations, at the Asia-Pacific Section Congress in Vietnam. As a result a proposal was put by Prof. Julian White, seconded by Prof. Dietrich Mebs, that "The Asia-Pacific Section of the IST supports the development of a clinical toxinology initiative by the IST." This was passed unanimously and confirmed unanimously at the IST World Congress in Recife, Brazil, March 2009. This important initiative is now officially a project of the IST. A Steering Committee will be established and a report to IST members. The IST will now work towards establishing clinical toxinology as an accredited and recognised medical specialty.

As part of this process, Prof. White has had initial informal discussions with some "key players" in the medical toxicology field, in North America, Europe and Australia. While very early in the whole process, these discussions have been positive and encouraging. Similar positivity was evident in discussions with WHO personnel, although again these were informal and the WHO has not yet been approached to support this initiative.

One likely outcome of developing clinical toxinology under the banner of the IST will be an increase in clinician membership and resurgence of clinical papers and posters at IST meetings, alongside the more basic and applied toxin research. The latter will not be in any way devalued by development of IST involvement in clinical toxinology. It is intended these two aspects of toxinology will grow in partnership.

It should also be recognised that the IST membership has been active in clinical toxinology training for many years, most notably the long-standing French course run through the Paris Museum of Natural History (now in its 30th year - congratulations to Max Goyffon), the International Clinical Toxinology Short Course (held in Adelaide since 1997), and the Brazilian course. The latter hosted discussions on clinical toxinology training at the IST World Congress in Brazil, March 2009, thanks to the efforts of Profs. Baravierra and Haddad.

The next international Clinical Toxinology Short Course will be held in Adelaide, Australia, March 2-7, 2010 (see details later in this Newsletter; pages 20-23). The faculty for this course has been expanded and this will provide a nucleus of committed individuals to start active development of a full clinical toxinology course, likely spanning multiple institutions and continents.

We would like to hear from clinicians with an active involvement treating clinical toxinology cases who are interested in becoming part of the process of developing and staging a global full course. If you fit this picture, please contact Prof. White at [julian.white@adelaide.edu.au](mailto:julian.white@adelaide.edu.au).

What we will likely require is a series of hospitals, each with a significant number of toxinology cases likely over a short time period, and with resources to host clinical toxinology trainees. This will provide trainees with direct exposure to and experience with treating actual toxinology cases and in a relevant local setting. It is envisaged that trainees will be fully qualified doctors, probably with higher-level qualifications in a specialty such as emergency medicine, intensive care medicine, or tropical medicine.

In parallel with this we need to develop close working relationships with key medical craft groups in individual countries, as these will be the local certifying bodies for the training scheme. Again, IST members who might fit this profile are invited to contact Prof. White.

We should not expect this process to deliver a solution quickly. It will take considerable time to set up both training facilities in selected locations, and the requisite national craft-group agreements. However, if set up appropriately, the scheme should be independent of any one key person and so have a likely long term future and viability.

*Julian White*





## **NEXT IST WORLD CONGRESS**

At the most recent IST World Congress in Brazil, March 2009, members present at the Business Meeting of the IST indicated interest in Hawaii being the venue for the next World Congress. However, Dr. Angel Yanagihara, from Hawaii, indicated she was not yet in a position to confirm the viability of holding the Congress there. Prof. Gopalakrishnakone also presented a comprehensive bid from Singapore. Normally this would then require a vote from members, but prior to a vote being held, the Singapore bid was withdrawn, leaving only the tentative bid from Hawaii.

All IST members should now work together to support Dr. Yanagihara and her colleagues in ensuring Hawaii can host a successful Congress, probably in 2012. The IST Council will need to work with our Hawaiian colleagues to determine the best time in 2012 to hold the Congress. We would welcome feedback from members on this, but initially sometime in June would seem suitable, because it would coincide with usually good weather, the end of teaching terms in the US and Europe, and would be close to holiday times for the Northern Hemisphere, allowing members to more easily schedule holidays with family, incorporating attendance at the Congress. We will be striving to ensure the Congress is affordable, including less expensive accommodation for student members. Because Hawaii is part of the US, members from some countries not covered by the US Visa-waiver program will need to organise visas well in advance. More on this as plans develop.

Organising an IST World Congress is not easy and requires a great deal of effort by local IST members. This work, on behalf of all of us, deserves to be valued by the membership and we should all see what we can do to assist the local organisers. It is particularly important to gain an idea of likely attendance to allow budget planning. Therefore, once plans are further advanced, we will ask all members to indicate if they definitely intend to attend the meeting, or will definitely not be coming. Once a Scientific Organising Committee is established for the Congress, input from members on possible meeting content will be sought.

For the present, members should communicate re the Congress via the Secretary IST ([julian.white@adelaide.edu.au](mailto:julian.white@adelaide.edu.au)) and President ([antgopal@nus.edu.sg](mailto:antgopal@nus.edu.sg)).



# 8th Australian Peptide Conference

Couran Cove,  
South Stradbroke Island,  
Queensland, Australia



## Peptides - Tools, Targets & Therapeutics 11-16 October 2009

An exciting scientific program will be arranged around the following topics:

- Antimicrobial Peptides
- Bioimaging
- Bioinformatics
- Drug Delivery
- Emerging technologies
- Glycopeptides
- Nanofabrication and peptide engineering
- New peptide ligands
- Peptide drugs
- Peptide Immunology
- Peptide Pharmacology
- Peptide post translational processing
- Peptide structure and function
- Peptides and biology: Probing biological systems
- Peptides and intracellular signalling
- Peptides as research tools
- Protein and peptide synthesis
- Protein-Peptide interactions
- Proteomics and Peptidomics
- Regenerative medicine
- Venoms to drugs

Satellite Meetings  
**Modern Solid Phase  
Peptide Synthesis  
& Its Applications**

8th-10th October, 2009  
Sea World Resort, Gold Coast  
[www.asnevents.com.au/solidphase](http://www.asnevents.com.au/solidphase)

**1st International Conference  
on Circular Proteins**

18th-21st October, 2009  
Heron Island Resort, Queensland  
[www.iccp2009.org](http://www.iccp2009.org)







## Heron Island Resort, 18-21 October 2009

### Heron Island, Queensland, Australia

# 1<sup>st</sup> International Conference on Circular Proteins



## Symposia

**Animals**

**Plants**

**Fungi**

**Microbes**

**Cyanobacteria**

**Synthetic**

**Applications**

**Commercialisation**

## Confirmed speakers

**Marilyn Anderson, Australia**

**Julio Camarero, USA**

**Laurent Chiche, France**

**Nick Dixon, Australia**

**Heike Dörnenburg, Germany**

**Ulf Göransson, Sweden**

**Christian Gruber, Austria**

**Robin Leatherbarrow, UK**

**Bob Lehrer, USA**

**Mike Selsted, USA**

**Kaarina Sivonen, Finland**

**Hiroaki Suga, Japan**

**Jonathan Walton, USA**

## Prior conferences

**Modern Solid Phase Peptide  
Synthesis & Its Applications**

8-10 October

Sea World Resort, Gold Coast,  
Queensland

[www.asnevents.com.au/solidphase](http://www.asnevents.com.au/solidphase)

**8<sup>th</sup> Australian Peptide  
Conference**

11-16 October

Couran Cove, South Stradbroke  
Island, Queensland

[www.peptideoz.org](http://www.peptideoz.org)

The circle is a unique topology: no beginning or end. When translated into cyclic peptides this topology results in remarkable stability against chemical or proteolytic degradation. Cyclic peptides are thus of much interest as stable bioactive molecules in the pharmaceutical industry. Micro-organisms also use cyclisation as a strategy to produce a variety of bioactive molecules, some of which have been adapted as pharmaceuticals. The fungal cyclic peptide cyclosporin, for example, has revolutionised organ transplant therapy due to its potent immunosuppressive activities.

Most of the earliest known cyclic peptides are small (<12 amino acids) and are biosynthesised by non-ribosomal peptide synthetases. However, over the last decade many new classes of gene-encoded cyclic peptides and circular proteins have been discovered. These are the focus of this conference. Examples are now known in bacteria, fungi, plants and animals.

The aim of this conference is to bring together researchers working in the field of gene-encoded circular proteins to exchange ideas, decipher common mechanisms of processing and cyclisation, and ponder the future for potential pharmaceutical and agricultural applications of these fascinating molecules. Delegates will meet on (an almost circular) island on the Great Barrier Reef where there will be a chance to interact in a relaxed environment. I have great pleasure in welcoming you to this 1<sup>st</sup> international conference on circular proteins.



*David J. Craik*

David J. Craik

**Registration now open, early bird registration closes 1 July**  
**[www.iccp2009.org](http://www.iccp2009.org)**



## 17<sup>th</sup> Meeting on Toxinology

Paris (Pasteur Institute)  
December 2<sup>nd</sup> – 3<sup>rd</sup>, 2009



We are pleased to invite you to the 17<sup>th</sup> Meeting on Toxinology organized by the French Society of Toxinology (SFET<sup>1</sup>) that will be held on December 2<sup>nd</sup>-3<sup>rd</sup>, 2009 in Paris (Pasteur Institute, J. Monod amphitheatre). This year, the meeting will be focussed on : **“Toxins and Signalling”**.

The official language is English. Nevertheless, some presentations in French may be accepted if all the informations are indicated in English on the slides and posters.

Although the main part of the meeting will be dedicated to Toxins and Signalling, Thursday afternoon will be opened to communications on recent results in other toxin fields such as: identification of new toxins, structure/function of toxins, toxins and environment, envenomation... Communications from young scientists (PhD, post-docs...) are strongly encouraged.

### CALL FOR COMMUNICATION

You are invited to propose an oral communication or a poster in the central theme of the meeting, as well as in other toxinology fields. In that goal, you have to send an abstract of no more than one page to the SFET secretary ([fgoudey@noos.fr](mailto:fgoudey@noos.fr)) before **July 15<sup>th</sup> 2009**, except if you have previously submitted a manuscript for publication in the 2009 e-book (see below).

### CALL FOR PUBLICATION

Since last year, and after seven books of the series « Rencontres en Toxinologie » edited by the SFET, the society has decided to publish e-books. Please, consult the 2008 e-book accessible from the SFET WEB site : <http://sfet.asso.fr/images/stories/SFET/pdf/EBook-RT16-2008-signets.pdf>. The 2009 e-book will be available on line, free of charges, at the beginning of the meeting.

All of you are invited to submit an article and, to this purpose, to send before **June 30<sup>th</sup> 2009** a short abstract (see the file next page) to the SFET secretary ([fgoudey@noos.fr](mailto:fgoudey@noos.fr)). The abstracts will be examined by the Editing Committee. The manuscript corresponding to a selected abstract must be sent to the SFET secretary before **July 30<sup>th</sup> 2009**, to be examined by two referees.

<sup>1</sup> Please, visit the SFET WEB site <http://www.sfet.asso.fr/>

**17èmes Rencontres en Toxinologie (RT17)**  
**02 et 03 décembre 2009**  
**Amphithéâtre J. Monod, Institut Pasteur, Paris**  
**Preliminary Program: Toxins and Signalling**

**Invited speakers**

**Rick TITBALL** (School of Biosciences, University of Exeter, UK)

Signalling pathways activated by *C. perfringens* alpha-toxin

**Bernard POULAIN** (Institut des Neurosciences cellulaires et Intégratives, Strasbourg, France)

Attack of the central nervous system by Epsilon toxin from *Clostridium perfringens* : the cell targets and mechanisms.

**Gisou VAN DER GOOT** (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

How anthrax toxin orchestrates its own uptake into mammalian cells

**Klaus AKTORIES** (Institut für Experimentelle und Klinische Pharmakologie und Toxikologie, Albert-Ludwigs-Universität, Freiburg, Germany)

*Pasteurella multocida* toxin activation of heterotrimeric G proteins

**Gilles PREVOST** (Institut de Bactériologie, Strasbourg, France)

From the interacting molecular surfaces of staphylococcal leucotoxins with membranes, and their different impact on innate immunity

**Guido KROEMER** (Institut Gustave Roussy, Villejuif, France)

Autophagy - part of an integrated cellular stress response

**Amparo ALFONSO** (Departamento de Farmacología. Universidad de Santiago de Compostela, Lugo, Spain)

Recent developments on the mechanism of action of marine phycotoxins

**Michel DE WAARD** (Institute of Neuroscience, Grenoble, France)

Maurocalcine-derivatives as biotechnological tools for the penetration of cell-impermeable compounds

**Other speakers in the RT17 theme**

**Alain VAN DE WALLE** (Centre de Recherche Biomédicale Bichat-Beaujon, Paris, France)

Mechanisms of cell death caused by pore-forming clostridial toxins

**Daniel LADANT** (Institut Pasteur, Paris, France)

Bacterial toxins that target cyclic AMP signalling in eukaryotic cells

**Ana Cristina SOTOMAYOR PÉREZ** (Institut Pasteur, Paris, France)

Calcium-induced folding of the intrinsically disordered RTX motifs from *Bordetella pertussis* adenylate cyclase toxin

**Vincent POPOFF** (Laboratoire Trafic et Signalisation, Institut Curie, Paris, France)

Multi-step endosomal retrograde sorting of Shiga toxin

**Blandine GENY** (Institut Pasteur, Paris, France)

Lethal toxin from *Clostridium sordellii* modifies sequentially or independently several cellular signalling pathways

**Emmanuel JOVER** (Institut des Neurosciences cellulaires et Intégratives, Strasbourg, France)

$\gamma$ -Haemolysin HlgB/HlgC induces glutamate release from granular neurons of rat cerebellum after intracellular calcium mobilization

**Julien BARBIER** (CEA, Simopro, Gif sur Yvette, France)

New compounds inhibiting specifically toxin trafficking through the retrograde pathway

**Other speakers in other themes**

**Rowan DOBSON** (Université de Liège, Belgique)

Maturation of toxins in the venom duct of *conus textile*

**Delphine BOERIO** (CNRS, Neurobiologie Cellulaire et Moléculaire, Gif sur Yvette, France)

A non-invasive method to appraise the time-dependent effects of toxins on the mouse peripheral nervous system in vivo

**Naoual OUKKACHE** (Institut Pasteur, Casablanca, Maroc)

Une nouvelle approche pour caractériser le venin de scorpion Marocain *Androctonus mauretanicus mauretanicus*

**Amal LAHRACHE** (Institut Pasteur, Casablanca, Maroc)

Effet du venin d'*Androctonus mauretanicus mauretanicus* sur les paramètres biologiques chez le lapin

# NATURAL PEPTIDES TO DRUGS

## 4<sup>th</sup> International Congress



Improving on Nature or Relying on Nature?

**Book the dates!**

**11 - 14 April 2010**  
**Zermatt, Switzerland**  
[www.np2d.com](http://www.np2d.com)

### First Announcement

Following the success of the three editions held since 2002, we are glad to announce the organisation of the 4<sup>th</sup> NP2D congress at the foot of the majestic Matterhorn mountain, in Zermatt ! NP2D is not a conventional scientific conference. It aims at offering a fantastic experience bringing together high level science, fruitful interactions among the participants & exciting social activities, all in the warm and friendly atmosphere of the Swiss Alps.

### Scope & Format

NP2D is an international, interdisciplinary exchange platform for specialists and decision makers involved in major overlapping areas of pharmaceutical peptides R&D such as: **peptide hormones, toxins, immunomodulators and antimicrobial peptides.**

The scope is meant to cover the whole spectrum **from discovery to market**: drug discovery, biomarkers, clinical trials, peptides in the food and cosmetic markets, delivery systems, peptide synthesis and manufacturing, funding strategies, regulatory issues, intellectual property, reaching the drug market.

The audience is strictly limited to **120 participants**, typically from more than **20 countries**, with a good balance between **academic and industrial** backgrounds, allowing for stimulating opportunities of interaction between academic and industrial research directors, development and production professionals from the pharma, biotech, food and cosmetic industry, service providers and CROs, suppliers of technology and instrumentation, as well as consultants and venture capitalists.

### The Programme at a glance

The scientific programme is built around 10 plenary lectures, 20 oral presentations, hot-spot sessions (short 5 minute business & scientific oral presentations), and a round-table on '**Future Perspectives in Peptide R&D**'. Again we expect high level speakers from various origins and backgrounds.

Offering ample time for social activities, this 4<sup>th</sup> NP2D congress aims to continue promoting fruitful interactions among the participants and above all, long-lasting relationships.

### Organisers

- **Organiser:** Reto Stöcklin.
- **Scientific Steering Committee:** Paul Alewood, Richard DiMarchi, Peter Hoffmann, John P. Mayer, George Miljanich, Les Miranda, Robin Offord, Michael Pennington & Timothy Wells.

### Venue

Zermatt is at the foot of the majestic Matterhorn mountain in the Swiss Alps at an altitude of 1'620 m (5'315 ft). NP2D is offered as an attractive, all-included congress package at Zermatt's prestigious five-star Seiler Hotel Mont Cervin in the center of the village.

[www.np2d.com](http://www.np2d.com)







First announcement

## 2-Day National Symposium on Recent Advances in Snake Venom Research and Snake-bite Therapy: National and International Perspectives

18-19 December 2009

Organized by

**Department of Molecular Biology and Biotechnology**  
Tezpur University, Tezpur, Assam, India  
(Sponsored by DBT and ICMR, New Delhi)

### About the Symposium

Each year, approximately 421,000 cases of envenomation and 20,000 snakebite deaths occur through out the World. Problem of snakebite has been listed as "Neglected Tropical Disease" by WHO. This problem is more acute in our rural areas as well for the soldiers posted in the border areas. Therefore, characterization of biochemical and pharmacological properties of these proteins and polypeptides is important to understand their pharmacological effects during envenomation and also for snakebite treatment. Furthermore, these proteins and polypeptides have served as valuable research tools for therapeutic applications. Traditionally many medicinal plants have been used for treatment of snakebite without proper scientific validation. Active components from these plants may be used as green medicine for snakebite treatment as an alternative to antivenom therapy.

### Themes

1. Biochemistry/Bioinformatics/Biophysics/Molecular Biology of snake venom proteins/ enzymes/ toxins
2. Evolution of snake venom proteins and toxins
3. Pathophysiology and treatment of snakebite
4. Medical/biotechnological/diagnostic application of snake venom peptides
5. Green medicine for snake bite
6. Biology of Snakes and snakes in India

### The Host

Since its establishment in 1994 as a teaching and residential Central University, Tezpur University has established itself as an institution known for its quality of education and research in the frontier areas of science and technology. Tezpur is well connected by air, roads and rail from Guwahati. The world-famous tourist attractions Kaziranga Wild Life Sanctuary, Orang Sanctuary, and Bhalukpong Angling Spot are just one-hour drive from Tezpur. Department of Molecular Biology and Biotechnology has been recognized by the DBT, Ministry of Science and Technology. Government of India, and granted accreditations for the Post Graduate programme. The objective of the department is to contribute to the advancement of the emerging areas of basic and applied Life Sciences and to create trained manpower in the field of Molecular Biotechnology.

### Confirmed Speakers

Prof. C.R. Maity (Kolkata)  
Prof. T.V. Gowda (Mysore)  
Prof. R.M. Kini (Singapore)  
Prof. P Gopalakrishnakone (Singapore)  
Prof. S. P. Mackessy (USA)  
Prof. A. Gomes (Kolkata)  
Prof. J. Menon (Cochin)  
Prof T.P Singh (New Delhi)  
Dr. K. Kemparaju (Mysore)  
Dr (Mrs) A. Gomes (Kolkata)  
Dr. D. Bhattacharya (Kolkata)

(Other Scientist from India and abroad are also expected to participate)

### Important Dates and Information

Last date of abstract submission: 25<sup>th</sup> Nov, 2009  
Last date of registration: 25<sup>th</sup> Nov, 2009

### Registration Fee\*:

	Till 25 Nov	Spot
Indian delegates	Rs. 1000.00	Rs. 1500.00
Foreign delegates	USD 150.00	USD 200.00
Research students	Rs. 750.00	Rs. 1000.00
Industrial delegates	Rs. 1500.00	Rs. 2000.00
Accompanying persons (Indian)	Rs. 800.00	Rs. 1000.00
Accompanying persons (Overseas)	USD 100.00	USD 150.00

\*Registration fee should be send as Demand Draft drawn in favour of Organizing Secretary, SnakSymp-09, payable at SBI, Tezpur Branch

\*Registration fee includes symposium kit, breakfast, lunch and dinner during symposium.

### Travel Grant

Limited travel grants are available for research scholars below the age of 35 years. Please contact the Organizing Secretary for further details.

### Contact persons:

Prof. A.K. Mukherjee, **Organizing Secretary**

Email: [akm@tezu.ernet.in](mailto:akm@tezu.ernet.in)

+91 9957184351

Dr. Robin Doley, **Joint Secretary**

Email: [doley@tezu.ernet.in](mailto:doley@tezu.ernet.in)

+91 94357 54830

### Address for correspondence:

**Organizing Secretary**

Department of Molecular Biology and Biotechnology

Tezpur University, Tezpur-784028

Tezpur, Assam, India

Email: [snaksymp@gmail.com](mailto:snaksymp@gmail.com)



University of Adelaide  
Faculty of Health Sciences



# CLINICAL TOXINOLOGY SHORT COURSE 2010

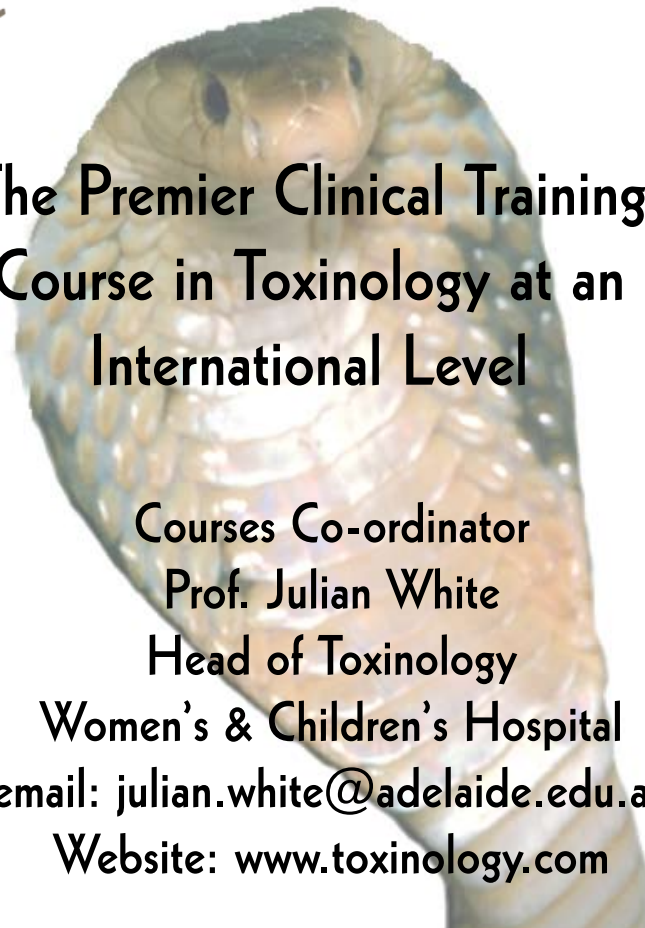
Women's & Children's Hospital  
Adelaide, Australia  
March 2nd to 7th  
2010



The Premier Clinical Training  
Course in Toxinology at an  
International Level

Courses Co-ordinator  
Prof. Julian White  
Head of Toxinology

Women's & Children's Hospital  
email: [julian.white@adelaide.edu.au](mailto:julian.white@adelaide.edu.au)  
Website: [www.toxinology.com](http://www.toxinology.com)





## IMPORTANT COURSE INFORMATION

### **COURSE RELATED QUESTIONS:**

#### **Who is this course designed for?**

Primarily for doctors/health professionals requiring detailed and practical information on snakebite, spiderbite, scorpion stings, marine envenoming, poisonous plants & mushrooms and related topics with a global and Australian perspective. It is particularly relevant for those working in emergency medicine, toxicology, intensive care, or in rural practice. Throughout there will be an emphasis on practical clinical issues and development of clinically relevant skills. It will also be of interest to poisons information pharmacists and graduate nurses in emergency medicine and toxinology scientists. You should be fluent in English, as no language translation will be available.

#### **When and where are the courses held?**

The course runs over 6 days; Tuesday March 2nd to Sunday March 7th, 2010. The venue is the Women's and Children's Hospital, North Adelaide, SA, Australia

#### **What does the course cover?**

We cover terrestrial & marine animals, plants & mushrooms, including extensive sessions on venomous snakes by region. Detailed sheets on course content will be available on the web at <http://www.toxinology.com>.

#### **Is the course accredited in any way?**

The course is a University of Adelaide postgraduate training course. We are seeking formal accreditation of continuing education points with relevant colleges and possible incorporation within some college specialist training schemes.

#### **How many people can attend the course?**

The maximum course capacity is 50 registrants, to ensure a chance for interactions with faculty. Previous courses filled early, so early registration is advisable.

#### **How much does the course cost and what does this cover?**

The course costs Aus\$2,000 (+GST for Australians only); the fee covers the full course, course notes, field trip, morning and afternoon teas and light lunches. It does not cover the course dinner or accommodation.

#### **Are there any course notes or reading material available prior to the course?**

We produce course notes for registrants prior to the course, which will include recommended textbooks and reading list. You are still strongly advised to take notes during all sessions. (The 2008 Course Handbook was 500 pages.)

#### **What sort of practical clinical sessions are included?**

The programme includes many interactive sessions discussing "clinical evolving problems" (CEPs) to develop registrant's understanding of clinical skills in toxinology and test those skills in a group setting. These are all based on real patients contributed by faculty members, drawn from their own clinical experience.

#### **Is there any formal evaluation of my performance on the course?**

Yes! Faculty will be evaluating all registrants on their interactions, especially during the clinical evolving problem sessions. On the Saturday there will be a written examination.

**For further information** check the Course pages on [www.toxinology.com](http://www.toxinology.com), or contact Prof. White ([julian.white@adelaide.edu.au](mailto:julian.white@adelaide.edu.au)).



# University of Adelaide and the Women's & Children's Hospital CLINICAL TOXINOLOGY SHORT COURSE ENROLMENT FORM & TAX INVOICE

First Name: ..... Last Name: ..... Title: ..... (Dr., Prof. etc)

Qualifications: .....

Institution: .....

Postal Address: .....

Suburb/City: ..... Postcode: .....

Country: .....

Telephone: ..... Fax: .....

Mobile phone: .....

Email: .....

Clinical experience with cases of envenoming?:  
.....

Arrival Date: .....

Departure Date: .....

What accommodation have you arranged?: .....

Have you checked to see if you need a VISA to enter Australia?: .....

### **PAYMENT DETAILS & TAX INVOICE**

**Women's & Children's Hospital  
ABN 609 832 74825**

Payment must be received by January 1st, 2010, to ensure enrolment.

Full International Clinical Toxinology Short Course (includes plants & mushrooms)  
(incorporates all elements of previous Australian courses; no separate Australian course will be offered in 2010)

March 2nd to 7th, 2010 Aus\$2,000.00 \* +GST of Aus\$200 if from Australia

PLEASE NOTE: If insufficient numbers enrol for the Course, the Course may be cancelled, in which case full refund of Course fees will be made. Course organisers do not accept responsibility for any other costs incurred by registrants, should the Course be cancelled. Course fees for 2010 have not increased since 2008 and cover costs incurred in staging the Course.

Payment by Bankers Cheque to "TOXINOLOGY COURSE WCH"

Mail to: Toxinology Dept, Women's & Children's Hospital, North Adelaide SA 5006 AUSTRALIA

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# LES ANIMAUX VENIMEUX ET VÉNÉNEUX



**Systematique,  
biologie,  
toxicologie**

**Année 2009 - 2010**

**MODULE I - Responsables : Max GOYFFON et Michel THIREAU**  
**Venimologie générale - Vertébrés terrestres**  
Lundi 18 janvier - Vendredi 22 janvier 2010

**Lundi 18 janvier 2010**

09h00 - 09h15 : **Accueil**

09h15 - 10h45 : **La fonction venimeuse**

C. ROLLARD, Muséum

11h00 - 12h15 : **Toxicité aiguë des venins et neutralisation par les antivenins**

J.-P. CHIFFPAUX, IRD, Paris

14h00 - 15h15 : **Venins : génomique, protéomique et bio-informatique**

R. STÖCKLIN, Atheris, Genève

15h30 - 17h30 : **Les amphibiens**

J. LESQUIRE, Muséum

**Mardi 19 janvier 2010**

09h00 - 10h45 : **Les serpents : anatomie de l'appareil venimeux**

J.-P. GASC, Muséum

11h00 - 12h00 : **Visite du vivarium de la ménagerie ou films sur les serpents**

14h00 - 15h00 : **Visite du vivarium de la ménagerie ou films sur les serpents**

15h30 - 17h00 : **Les serpents : systématique moléculaire**

N. VIDAL, Muséum

**Mercredi 20 janvier 2010**

09h00 - 11h30 : **Biologie, comportements des serpents**

X. BONNET, CNRS, Villiers-en-Bois

14h00 - 16h15 : **Composition et mode d'action des venins de serpents Viperidae**

F. DORANDEU, CRSSA, Grenoble

16h30 - 17h30 : **Les mammifères venimeux et les oiseaux vénéneux**

J.-L. BERTHIER, Muséum

**Jeudi 21 janvier 2010**

09h00 - 10h30 : **Composition générale et mode d'action des venins de serpents Elapidae**

D. SERVENT, CEA

10h45 - 12h15 : **Immunothérapie des envenimations ophidiennes**

M. SORKINE, clinique du Val d'Yerres, Yerres

14h00 - 16h30 : **Épidémiologie et clinique des envenimations ophidiennes**

J.-P. CHIFFPAUX, IRD, Paris

**Vendredi 22 janvier 2010**

09h00 - 10h15 : **Inhibiteurs naturels des PLA<sub>2</sub>. Résistance naturelle aux venins**

G. FAURE, Institut Pasteur, Paris

10h30 - 12h15 : **Les Atractaspidae : biologie et venins**

F. DUCANCEL, CEA

14h15 - 15h30 : **Anticorps recombinants neutralisants**

P. BILLIARD, Muséum et Tours

15h45 - 17h00 : **Synthèse et conclusion**

J.-P. CHIFFPAUX, IRD, Paris

**Renseignements, inscriptions et coordination :**

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43, rue Buffon, 75005 Paris  
Tél : 01 40 79 48 85

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**MODULE II - Responsables : Christine ROLLARD et Max GOYFFON**  
**Arthropodes terrestres - Parasites**  
Lundi 15 mars - Vendredi 19 mars 2010

**Lundi 15 mars 2010**

09h00 - 09h15 : **Accueil**

09h30 - 10h30 : **Présentation des arthropodes**

C. ROLLARD, Muséum

10h45 - 12h15 : **Venins d'arthropodes et spectrométrie de masse**

C. GUETTE, Angers

14h00 - 16h30 : **Les insectes hyménoptères**

J. WEULERSSE, Muséum

16h45 - 17h30 : **Les venins d'hyménoptères**

M. GOYFFON, Muséum

**Mardi 16 mars 2010**

09h00 - 12h15 : **Les insectes piqueurs autres que les hyménoptères**

P. BOURDEAU, ENV, Nantes

14h00 - 15h30 : **Les protistes. Les vers parasites. Effets venimeux**

P. BOURDEAU, ENV, Nantes

15h45 - 17h15 : **Composition et activités biologiques de la salive des diptères**

V. CHOUVET, Institut Pasteur, Paris

**Mercredi 17 mars 2010**

09h00 - 12h30 : **Les myriapodes : systématique, biologie et fonction venimeuse**

J.-J. GEOFFROY, CNRS et Muséum

14h00 - 16h15 : **Les acariens : biologie et fonction venimeuse**

R. CHERMETTE, ENV, Maisons-Alfort

16h30 - 17h30 : **Les acariens : systématique**

Y. COINEAU, Muséum

**Jeudi 18 mars 2010**

09h00 - 12h30 : **Les araignées : systématique, biologie, répartition, espèces dangereuses**

M.-L. CÉLÉRIER et C. ROLLARD, Muséum

14h00 - 15h15 : **Venins d'araignées et canaux ioniques**

S. DIOCHOT, CNRS, Sophia Antipolis

15h30 - 17h45 : **Les scorpions : systématique, biologie, répartition**

R. STOCKMANN, Paris

**Vendredi 19 mars 2010**

09h00 - 12h00 : **Les venins de scorpions**

C. LEGROS, Angers

14h00 - 16h15 : **Aranéisme - Scorpionisme**

M. GOYFFON, Muséum

**MODULE III - Responsables : Christine ROLLARD et Nadia AMÉZIANE**  
**Faune marine - Écosystèmes marins**  
Lundi 17 mai - Vendredi 21 mai 2010

**Lundi 17 mai 2010**

09h00 - 10h30 : **Panorama de la faune venimeuse et vénéneuse de la mer Méditerranée**

S. BAGHDIGLIAN, Montpellier

10h45 - 12h00 : **L'électrophysiologie comme méthode d'étude des biotoxines d'origine marine**

C. MATTEI, DGA

14h00 - 17h00 : **Les cnidaires**

M. GUILLAUME, Muséum

**Mardi 18 mai 2010**

09h00 - 10h30 : **Les mollusques**

P. FAUREAU, Atheris, Genève

10h45 - 12h30 : **Venins de cônes : diversité de leurs peptides et cibles moléculaires**

J. MOUGO, CNRS, Gif-Sur-Yvette

14h00 - 15h45 : **Les mollusques bivalves toxiques**

P. LASSUS, IFREMER, Nantes

16h00 - 17h00 : **Les annélides**

T. MEZIANE, Muséum

**Mercredi 19 mai 2010**

09h00 - 12h00 : **Les poissons venimeux**

F. GOUDEY-PERRIÈRE, UFR Pharmacie, Châtenay-Malabry

14h00 - 15h30 : **Les poissons venimeux (suite)**

F. GOUDEY-PERRIÈRE, UFR Pharmacie, Châtenay-Malabry

15h45 - 17h00 : **Les bryozoaires**

J.-L. D'HONDT, Muséum

**Jeudi 20 mai 2010**

09h00 - 11h00 : **Les éponges et les ascidies**

M.-L. BOURGUET-KONDRACKI, Muséum

11h15 - 12h45 : **Les échinodermes**

N. AMÉZIANE, Muséum

14h00 - 17h00 : **Ichtyotoxines. Toxines ciguatériques et ciguatera**

P. BOURDEAU, ENV, Nantes

**Vendredi 21 mai 2010**

09h00 - 09h45 : **Intoxications par consommation de chair de tortues marines**

J. LESQUIRE, Muséum

10h00 - 12h00 : **Les serpents marins (cours suivi d'un film)**

I. INEICH, Muséum

14h00 - 16h00 : **Les serpents marins (suite)**

I. INEICH, Muséum



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**IRD**  
Institut de recherche  
pour le développement

10<sup>th</sup>

Meeting of the  
**Pan American Section of the**  
 International Society on Toxinology

Hotel Real Intercontinental  
 San José, Costa Rica  
 April 18th – 22nd, 2010



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## Welcome / Bem-vindos / Bienvenidos



You are most welcome to join the 10th Meeting of the Pan American Section of the International Society on Toxinology (IST) in San José, Costa Rica.

This meeting will allow both basic and clinical researchers to exchange their knowledge and expertise on toxins derived from animals, plants and microorganisms.

Contributions on the molecular, biochemical, pharmacological, toxicological and immunological properties of toxins are welcomed.

The meeting will take place from April 18th to April 22nd, 2010, at the [Hotel Real Intercontinental](#), in San José, Costa Rica, at the heart of Central America.

Costa Rica is well known for its beautiful landscapes, cool volcanoes, warm beaches and amazing biodiversity.

This meeting will provide you with an excellent opportunity for scientific and social interaction. Don't miss it...

We look forward to welcoming you in San José!

With warmest regards,  
 Organizing Committee

Message from  
 Dr. P. Gopalakrishnakone  
 President of The IST

ICP



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 Clodomiro  
 Picado

ICT



Instituto  
 Costarricense  
 de Turismo



Photo  
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## Notice nécrologique

par

Max GOYFFON

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### ANDRÉ MÉNEZ (1943-2008)

Président du Muséum national d'Histoire naturelle depuis le mois de septembre 2006, André Ménez est décédé bien avant le terme de son mandat des suites d'une longue maladie dont l'évolution s'est brutalement accélérée. En France comme à l'étranger, sa mort a été un choc pour tous ceux, nombreux, qui l'avaient rencontré ou connu tout au long d'un parcours scientifique exceptionnel, conduit pour l'essentiel au CEA, et qui l'avait amené à la présidence de l'un des plus prestigieux établissements scientifiques de notre pays.

Ingénieur de recherches en 1968 au Service de Biochimie du CEN de Saclay (CEA), il soutient sa thèse de doctorat ès sciences à l'université de Paris 7 en 1977. En 1991, il devient chef du Département d'Ingénierie et d'Études des Protéines (DIEP). En 2003, il est délégué à la recherche auprès du directeur du Muséum national d'Histoire naturelle, avant d'en devenir le président. L'essentiel de son activité scientifique a été consacré aux toxines des venins, serpents d'abord, puis scorpions et cônes. Sa passion pour les venins l'avait conduit à créer et développer, ces dernières années, la fondation internationale Toxinomics, ayant pour but de séquencer le génome de diverses espèces animales venimeuses avec l'idée d'utiliser le potentiel thérapeutique de toxines aux effets très étroitement ciblés. Ce projet était soutenu par l'International Society of Toxinology, dont il était le président en exercice et géré avec l'aide de D. Mebs, secrétaire de l'IST, R. Stöcklin (Laboratoire Atheris, Genève) auxquels F. Ducancel (CEA) avait ultérieurement apporté son concours. Expert internationalement reconnu dans le domaine des venins et de leurs toxines, André Ménez est l'auteur de plus de 300 publications scientifiques originales dont deux livres. Il a été responsable ou co-responsable de l'organisation de divers colloques et congrès, tant en France qu'à l'étranger.

Chimiste de formation, André Ménez s'orienta rapidement vers la biochimie, à l'occasion d'une collaboration active et fructueuse avec J.-P. Changeux qui, grâce à sa technique originale de radiomarquage au tritium d'une bungarotoxine de haute affinité, parvint à isoler et étudier le récepteur nicotinique post-synaptique à l'acétylcholine. Dès lors, il ne devait plus abandonner les venins de serpents et plus spécialement les neurotoxines curarisantes d'élapidés terrestres (*Naja* sp.) ou marins (*Laticauda* sp.). La préparation d'anticorps polyclonaux, puis monoclonaux, lui permit d'observer que le pouvoir neutralisant d'un anticorps n'implique pas nécessairement une liaison de cet anticorps avec son site de fixation sur le récepteur. Il dépend en réalité du changement de conformation de la toxine que peut induire la fixation d'un anticorps, même en un site topographiquement éloigné du site "actif" de la toxine. De fait, André Ménez a montré que la fixation d'un anticorps sur une toxine liée à son récepteur neuronal induit une perte d'affinité de la toxine pour le récepteur : en d'autres termes, les anticorps antitoxines peuvent posséder outre un effet protecteur préventif par capture d'une toxine libre, un pouvoir curatif par augmentation de la dissociation de la liaison toxine-récepteur ce qui justifie, au moins dans les envenimations neurotoxiques, une sérothérapie tardive.

Dans une étape suivante, les travaux d'André Ménez sont marqués par l'utilisation des techniques de mutagenèse dirigée. Combinées aux techniques spectroscopiques (RMN, cristallographie), elles le dirigent vers des analyses structurales des toxines de venins dont il élargit le choix. Dans les venins de serpents, mais aussi de scorpions, d'anémones de mer, de cônes, André Ménez s'intéresse plus spécialement à deux grands groupes de toxines : les toxines dites "à trois doigts", bloquant les récepteurs nicotiniques à l'acétylcholine et les toxines bloquant les canaux potassium voltage-dépendants. Observant que des cœurs de liaison identiques



peuvent apparaître sur des toxines d'architecture très différente, il en conclut que les toxines animales semblent adopter une stratégie universelle pour se lier avec une haute affinité aux différentes familles de récepteurs ou de canaux. C'est à partir de ces résultats qu'il conçoit la création de la Fondation Toxinomics chargée du séquençage du génome d'animaux venimeux.

André Ménez fut très tôt un fidèle du Muséum national d'Histoire naturelle bien avant d'en devenir le président, et d'y avoir au préalable assuré les fonctions de délégué à la recherche en 2003-2004. Dès le début de la décennie 70, il noua des liens étroits et durables avec le laboratoire de Biophysique, alors dirigé par Claude Hélène, puis par Madame Thérèse Garestier. Il participa régulièrement aux enseignements sur les "Animaux venimeux" dès leur présentation sous la forme actuelle en 1983. Son cours sur les venins d'élapidés était un des points forts de la session "Vertébrés terrestres venimeux", et son brio, la clarté de son discours, suscitaient chaque année le même enthousiasme. Il était très attaché à cet enseignement qu'il assura jusqu'à la fin, même pendant son temps de présidence.

Ce bref résumé laisse apparaître un rythme d'activité constamment soutenu à un très haut niveau. Ses publications, ses brillantes qualités de conférencier, d'organisateur, lui valaient de très nombreuses sollicitations, tant dans son cadre professionnel du CEA qu'en France ou à l'étranger. Il était sans cesse invité à des colloques ou à dispenser des cours, notamment au Japon ou à Singapour. Il n'a pas négligé non plus les activités de terrain et a été à plusieurs reprises collecter des serpents marins. Au-delà de sa vie professionnelle, l'homme était attachant par une réflexion sans cesse en éveil, un dynamisme contagieux, une ouverture d'esprit qui impressionnait les jeunes chercheurs auxquels il a toujours réservé le meilleur accueil, une réelle fidélité en amitié. Ses qualités se manifestaient tout aussi bien en dehors du cadre universitaire, et il offrait le même accueil aux personnes qui s'adressaient à lui comme spécialiste des venins et des animaux venimeux, éleveurs de serpents en particulier. Il a ainsi contribué directement ou indirectement à la réussite d'entreprises de production de venin ou d'élevages de serpents créées par des personnalités passionnées, volontaires et tenaces, avec lesquelles il a parfois collaboré.

André Ménez fut longtemps un membre actif de la Société Herpétologique de France. Ses activités multiples ne l'en ont jamais éloigné. Il était resté un lecteur du Bulletin, et acceptait volontiers de donner son avis sur tel ou tel article qui lui était soumis pour une éventuelle publication. Il vint à la section parisienne de la SHF présenter ses recherches sur les venins et fit l'admiration de tous par la clarté de son exposé. Il avait le don de se faire aussi bien comprendre d'un public d'amateurs que d'un aréopage d'universitaires. Il participa au Colloque de Lyon, en juillet 1987, sur le thème "Serpents, venins, envenimations" et y donna une conférence intitulée "Les principales toxines des venins des Serpents Elapidae et Hydrophiidae". En 2006, il vint présenter une conférence à Mouthier Haute Pierre (Doubs), dans le cadre du congrès annuel de la société qui cette année-là célébrait le centenaire de la mort de Césaire Phisalix, découvreur du sérum antivenimeux : il n'avait pas oublié les premières étapes de ses travaux sur les anticorps neutralisants des neurotoxines curarisantes de venins d'élapidés, et une fois de plus son exceptionnel talent enchantait l'auditoire. La SHF voit disparaître avec une sincère et profonde tristesse, plus encore qu'un herpétologiste de renommée mondiale, un grand et fidèle ami.

André Ménez, président du Muséum national d'Histoire naturelle (2006-2008).

André Ménez, president of the Muséum national d'Histoire naturelle (2006-2008).



## Notice nécrologique

par

Max GOYFFON<sup>(1)</sup>, Grazyna FAURE<sup>(2)</sup> & Bernard SALIOU<sup>(3)</sup>

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(retraité de l'Institut Pasteur, ex-technicien supérieur de l'Unité des Venins)

### CASSIAN BON (1944-2008)

Né le 31 mars 1944 au Viêt Nam dans une période troublée qu'il évoquait souvent, Cassian Bon revint très jeune en France, et fit ses études secondaires à l'École Sainte Geneviève de Versailles, pour être ensuite admis en 1966 à l'École normale supérieure, rue d'Ulm ajoutait-il volontiers. En 1972, un service national dans les scientifiques du contingent devait décider de la suite de sa carrière. Affecté dans un laboratoire de l'Institut Pasteur de Paris dirigé par France Tazieff, il fut amené à étudier les venins de scorpions. Après avoir quitté ce laboratoire, il ne devait plus cesser de travailler sur les venins, venins de serpents pour l'essentiel, ainsi que sur les sérums antivenimeux, tout au long d'une double carrière, au CNRS et à l'Institut Pasteur de Paris.

Sous la direction de Jean-Pierre Changeux, il prépare puis soutient en 1979 une thèse de doctorat sur le venin du serpent élapidé asiatique *Bungarus caeruleus*, aux propriétés curarisantes, et sur la neurotoxine majeure du venin du serpent crotaliné américain *Crotalus durissus terrificus*. Par la suite, après un passage comme chargé de recherche au CNRS dans l'unité de Pharmacologie cellulaire dirigée par Boris Vargaftig, où il prend la direction du laboratoire des venins, il devient successivement directeur de recherche au CNRS (1987), directeur de l'Unité des venins (1990) et chef de laboratoire à l'Institut Pasteur de Paris (1991).

Ses recherches sur les venins de serpents s'orienteront successivement dans trois directions. Tout d'abord, il développe les projets engagés au cours de sa thèse de doctorat ès sciences et continue à étudier le mécanisme d'action de la crotoxine, neurotoxine dimérique présynaptique paralysante. Ses travaux d'ordre immunochimique sur cette toxine le conduisirent quelques années plus tard, à se pencher sur les envenimations expérimentales et humaines ainsi que sur la sérothérapie antivenimeuse, rejoignant ainsi la tradition pasteurienne initialisée par Albert Calmette en 1894, dont il se voulait le continuateur historique. Il définit expérimentalement les paramètres toxicocinétiques de la diffusion d'un venin dans un organisme après injection par voie intraveineuse ou par voie intramusculaire, et les modifications de ces paramètres lors de l'injection d'un sérum antivenimeux contenant des fragments d'anticorps capables (Fab) ou incapables (Fab'2) de franchir le filtre rénal. De plus, il contribue à mettre au point une technique de dosage du venin dans le sang et dans les urines des patients envenimés, par test ELISA, et vérifie que l'intensité des signes cliniques est bien corrélée à la quantité de venin libre circulante. Il sera vite reconnu internationalement pour ses compétences en matière de sérothérapie, et dès 1983 devient un expert régulièrement consulté par l'OMS. Enfin, il va s'intéresser de façon croissante aux composés des venins de Viperidae actifs sur la coagulation sanguine, avec l'idée de promouvoir des molécules d'intérêt thérapeutique utilisables dans le traitement d'accidents thrombotiques.

Ses fonctions à l'Institut Pasteur comme au CNRS sont multiples : directeur du département de Physiopathologie de l'Institut Pasteur, (1994-1997), membre du Conseil scientifique de l'Institut Pasteur de Paris (1995-1999), puis de l'Institut Pasteur de l'Iran (1998-2004), directeur de recherche de première classe au



Cassian Bon, photographié avec son équipe dans son laboratoire de l'Unité des Venins, à l'occasion de sa nomination comme de chef de l'Unité des Venins de l'Institut Pasteur de Paris, en 1990. Photo : Bernard Saliou.

*Cassian Bon, with his team in 1990, just when he was appointed as Head of the Venoms Unit, Institut Pasteur, Paris. Picture: Bernard Saliou.*

CNRS (1997). Co-fondateur de la Société française pour l'étude des Toxines (1992), il en devient le président pendant près de huit ans (2000-2008). Il fut par ailleurs membre de nombreuses sociétés savantes françaises (Société française pour l'étude des Toxines, Société française de Biochimie et de Biologie moléculaire, Société des Neurosciences) et étrangères (International Society of Toxinology, International Society of Thrombosis and Hæmostasis).

Son activité dans le domaine du traitement des envenimations ophidiennes et scorpioniques le rapprochait de l'OMS et plus généralement de problèmes de santé publique, importants dans les pays d'Extrême-Orient, d'Afrique et d'Amérique latine. Il étendit aux envenimations scorpioniques les études pharmacocinétiques expérimentales des sérums antivenimeux et de leurs effets sur les paramètres toxicocinétiques de la diffusion du venin. L'ensemble de ses publications sur ces sujets fait toujours référence, tant pour les envenimations ophidiennes que pour les envenimations scorpioniques. Il se rapprocha davantage encore du monde médical en conduisant en France une enquête rétrospective sur les morsures de vipères sans équivalent à ce jour, et dont les résultats se sont largement diffusés dans le monde hospitalier. Il co-organisa en 1995 à l'Institut Pasteur de Paris un congrès international important sur les envenimations et leur traitement. Il sera dès lors régulièrement invité par l'OMS comme expert des envenimations ophidiennes et de la sérothérapie au sein d'une commission internationale de standardisation des sérums antivenimeux (Expert Committee on Biological Standardization).

Il était étroitement lié aux Instituts Pasteur du réseau producteurs de sérum antivenimeux : Tunisie, Algérie, Maroc, Iran. Il resta membre du Conseil scientifique de l'Institut Pasteur d'Iran jusqu'en 2004. En France, il participait activement à divers enseignements de DU de pathologie tropicale (Paris, Rennes, Marseille), assurant de nombreuses heures de cours sur les envenimations humaines et leur traitement. Ses activités d'enseignement débordaient largement du cadre de la pathologie tropicale : participation, depuis la création de l'école doctorale du Muséum (1995), aux enseignements de cette école (Animaux venimeux et vénéneux)

ainsi qu'au master (2004) de cet établissement (Évolution, patrimoine naturel et Société, spécialité Unité et diversité du vivant) qui avait fait suite au DEA "Interactions toxiques dans les écosystèmes et biotechnologies liées aux toxines". En venant travailler au Muséum national d'Histoire naturelle, en 2005, il se retrouvait ainsi plongé dans une ambiance qui lui était familière.

Il fut un membre de la première heure de la Société Herpétologique de France à laquelle il resta toujours fidèle. Une de ses caractéristiques était précisément sa fidélité à sa jeunesse et aux liens qu'il avait noués au cours de ses études et dans les débuts de sa carrière professionnelle. Il est ainsi resté, sa vie durant, un membre actif des associations d'anciens élèves de "Ginette" (École Ste Geneviève) et de l'ENS. Il a de même participé pleinement à plusieurs congrès de la SHF : ses interventions au congrès de Lyon, en 1987, sont encore présentes dans la mémoire de tous les participants. En 2006 et malgré son état de santé, déjà altéré à cette époque, il était présent le samedi 24 juin à l'inauguration par les autorités locales de la maison natale de Césaire Phisalix, à Mouthier Haute Pierre où se tint le congrès annuel de la SHF. Représentant le Muséum national d'Histoire naturelle, il y prononça une courte allocution où il évoquait la concurrence entre Phisalix (Muséum national d'Histoire naturelle) et Calmette (Institut Pasteur) au sujet de la découverte du sérum anti-venimeux. Il a écrit, aux éditions Bordas comme dans le Bulletin de la SHF, divers articles de synthèse qui restent encore des classiques distribués aux auditeurs des cours du Muséum sur les "Animaux venimeux et vénéneux" dont il était l'un des piliers. Il fut également un lecteur fréquemment consulté des articles sur les venins de serpents proposés à la SHF. Sa disparition laisse un grand vide.

Ses dernières années furent troublées par de multiples difficultés qu'il surmonta avec une énergie et une égalité d'humeur soulignées par tous ceux qui l'approchèrent. Ni la mala-die qui se déclara précocement et ne cessa de s'aggraver, ni la fermeture en 2004 de l'Unité des venins de l'Institut Pasteur de Paris qu'il dirigeait depuis 1990, ne ralentirent son activité. Accueilli d'abord par le département d'Ingénierie et d'Études des Protéines du CEA, puis par le laboratoire de Chimie des Substances naturelles du Muséum national d'Histoire naturelle en 2005, il donna la priorité aux enseignements et à l'organisation de colloques, en particulier aux Rencontres annuelles de la Société Française pour l'étude des Toxines. Décédé le 20 mars 2008 après une brève hospitalisation, il laisse, au terme d'une œuvre publiée de plus de 300 articles, le souvenir d'une personnalité accueillante, d'une haute culture scientifique, au dynamisme et à la ténacité exceptionnels.

*Manuscrit accepté le 6 janvier 2009*

*Vipera berus* (Linné, 1758), 14 juin 2006, Guiry-en-Vexin, Val d'Oise, France. Photo : J.-C. de Massary.



*Vipera berus* (Linnaeus, 1758), 14 June 2006, Guiry-en-Vexin, Val d'Oise, France. Picture: J.-C. de Massary.



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## CONCO, the cone snail genome project for health

By Ysadora Charital<sup>1</sup> and Reto Stöcklin<sup>1 & 2</sup>

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### **Natural heritage for health**

The biodiversity offered by nature will provide a great source of bioactive compounds, especially with toxins that are found in venoms and poisons. Produced by bacteria, fungi, algae, higher plants or animals, these active molecules may cause lethal effects but may also offer huge benefits if used appropriately.

Convert the destructive power of toxin into life-saving drugs that is the very important challenge of many scientists. Because their investigations will be an important source of potential therapeutics, and besides a pool of information, numerous studies are being investigated about snakes, lizards, spiders, scorpions, shrews, cone snails, sea anemones or even platypus venoms.

Medication for hypertension, pain, diabetes, angina, based on animal venoms are already used with five existing drugs derived for example from snake (Brazilian lancehead, rattlesnakes), lizards (Gila monster) and marine cone snail (the magician's cone) venom. Many others are in clinical or pre-clinical development.

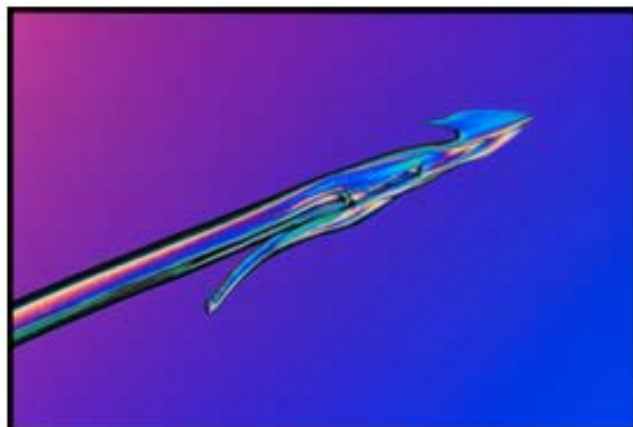
Amongst them is XEP-018, a natural peptide that is expected to move through pre-clinical to Phase-I clinical trials for pain control and anaesthesia. This promising molecule was isolated from a venomous marine cone snail: the *Conus consors*.

### **The *Conus consors* venom and the CONCO project**

Inside the beautiful and apparently harmless shells of this tropical cone snail, a terrible predator is hidden. Feeding on fishes, this venomous marine gastropod is able to chase them by injecting a powerful and lethal cocktail of molecules using a highly sophisticated harpoon.



*The venomous *Conus consors**



*Harpoon of the *Conus**

The study of animal's bioactive substances and genes that produce them is the topic of the CONCO research project funded by the European Union (LHSF...) and coordinated by Atheris Laboratories. CONCO, which is integrated in the ambitious Venomics initiative is dedicated to the discovery and the development of potential bioactive compounds that are synthesised by the cone snails. Through the deep and exhaustive investigation of the venom (peptidomics & proteomics), venom gland (transcriptomics) and the full genome of the *Conus consors*, this research project aims at identifying and characterising new therapeutically relevant molecules.

The venom of this little predator contains hundreds of active compounds called conopeptides that

can be identified by highly sophisticated techniques available in the 19 CONCO expert teams in Europe, and through the Craig Venter Institute in USA in charge of the genome sequencing. Genomic data and biodiversity studies will also provide information about how factors related to intra- and inter-species, environmental constraints, food, sexual and seasonal variations influence the evolution of the venom. Important data that will be created will be stored in a thoroughly annotated database available on a dedicated web-based platform.

### **Scientific expedition for cone snail collection**

Cone snails are widely distributed and are present in all oceans and at any depth. They are particularly well represented in the Pacific Ocean where *Conus consors* can also be found. Cone snails are widely represented in the shallow waters bathing New Caledonia and French Polynesia where expeditions have recently taken place to collect a few specimens for CONCO research.

Organised by CONCO with the support of the French Institute for the Exploitation of the Sea (IFREMER), the French Institute for Research and Development (IRD), the National Museum of Natural History in Paris, the Toxinomics Foundation and Atheris laboratories in Geneva (Switzerland), these expeditions conducted with great respect for the environment were made possible thanks to the contribution of the French Marine Forces and in close partnership established with local government of New Caledonia and French Polynesia.

Scientific expeditions, even if they look exciting, are by far not as easy as it seems at a first glance. The precious snail is tricky to find. It lives hidden on the ocean bottom and only shows its beautiful shell for a few minutes at night, when it is on the search for preys to harpoon. Even scientific divers have to be careful, protect themselves against the sharp needle and the lethal venom that are parts of the complex venomous apparatus of the gastropod.



The most recent mission carried out in November 2008 in Chesterfield Islands, several miles away from New Caledonia coast, to complete the sample collection of cone snails and to prepare a documentary film.

Pictures by Alain Gerbault, Jean-Louis Menou, Roberto Rinaldi and Reto Stöcklin. © 2009 The Toxinomics Foundation.

*(Continued on page 34)*



## Cobra venom Factor (CVF)

**Frank Madaras**

**Adjunct Research Associate; School of Pharmacy & Medical Science  
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The venoms of most cobras contain an anticomplement enzyme toxin called; “Cobra Venom Factor” (CVF). CVF specifically interacts with the complement system causing its activation, and subsequent depletion of the complement enzymes. The complement is an essential part of the immune system, any damage caused to the complement system impairs the immune response of the body.

CVF is an analogue of the active serum complement enzyme C3b. Once injected into the body CVF activates the complement system, although CVF is an analogue of C3b it differs in one crucial respect; the active C3b complex has a short half life (< 1 minutes), however the half life of the CVF (Bb) complex is > 7 hours. Because of this long half life CVF continually activates the complement system until all the complement enzymes have been depleted. CVF effectively de-complements the blood (serum), and leaves the body devoid of complement. Apart from its effect on the complement system CVF is “non toxic” and animals injected with CVF show no ill effects. This has been exploited extensively in medical and biological research to study, and elucidate the role of the complement system in the immune response of the body.

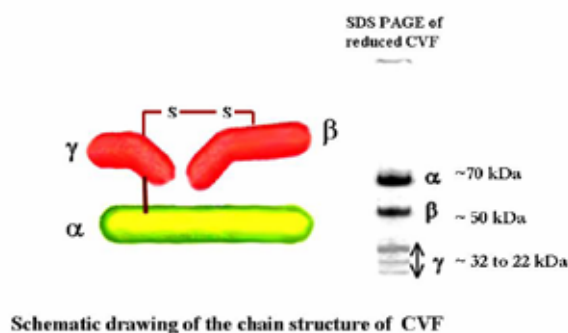


Figure 1 shows the molecular structure of CVF. The enzyme has a MW of ~ 150 kDa and is composed of three chains; alpha, beta, and gamma. *The CVF\* used in this study was supplied by; “Venom Supplies PTY., LTD” (Australia).*

*\*This CVF was purified from the African forest cobra venom (Naja melanoleuka). Some other research studies had made use of CVF isolated from the Thai cobra (Naja kaouthia). There seems to be no difference between the two CVFs in respect to biological activity, structure, and stability.*

Injection of CVF into laboratory animals causes the consumption of the complement components.

Figure 2 shows an invivo experiment where pure CVF was injected into mice (25 µg/mice, intraperitoneal injection), and at various time intervals the residual concentration of complement factor C3 was measured in the serum. After 12 hours post CVF injection there was no measurable C3 left and only after 72 h was some newly synthesized C3 detected.

The time period where the complement is depleted can be used to do various immunological experiments to see if complement is involved in these reactions.

*The CVF used in this study was obtained from Venom Supplies P/L (Australia). This CVF was*



## **FRESHWATER STINGRAYS: AN EXPERIENCE WITH THE QUIET INVADERS OF BRAZILIAN RIVERS.**

**Vidal Haddad Junior\* & Domingos Garrone Neto\*\*.**

**\*MD, PhD, PSC, Botucatu School of Medicine, São Paulo State University / \*\* PhD in Biology, São Paulo State University.**

Freshwater stingrays belong to the Potamotrygonidae family, a group of fish present only in river systems of South America. Some species of marine stingrays can venture into waters estuarine, but only potamotrygonids have unique adaptations to live in freshwater environments.

The group probably originated in the Miocene, about 30 million years ago. In that time, their ancestors left the sea and conquered the waters of the South American continent, coming from the region of the Caribbean Sea to the Amazon Rivers. Currently, the Potamotrygonidae stingrays occur in rivers of Colombia, Venezuela, Paraguay, Argentina, Uruguay, Bolivia and Brazil.

Brazil is the country that presents the largest number of species (about 16 of the 18 described). The geographical distribution of the stingrays includes the rivers of the Amazon and Paraná-Paraguay basin (near 2/3 of the country area). Recently, our group proved the existence of populations of stingrays in Tietê and Paranapanema rivers, already in the São Paulo State, which originally did not exist (see Figure 1). Their presence in the most populous state of the country may cause a problem well known in the North and Midwest regions of Brazil: accidents in humans (about 50 envenoming were observed).

The arrival of the stingrays is closely linked to human activities carried in the region over the past three decades. The submersion of the waterfalls of the Seven Falls (Guaira - PR) during the filling the Itaipu reservoir in the decade of 80, enabled the advancement of stingrays and other species of fish into the upper reaches of the Paraná River.

### ***Envenoming by freshwater stingrays***

Stingrays are not aggressive animals, but they have 1 to 4 hard and serrated barbs for their defense, located in the tail (Figure 2). The epithelium that covers the sting has toxins that present neurotoxic and proteolytic effect. In general, injuries happen when the stingrays are stepped by bathers, although we can see envenoming in professional and amateur fishermen and aquarists. Stingray stings cause violent pain for a period from 6 to 12 hours. As a rule, is established local necrosis (the venom has a high concentration of hyaluronidase) and formation of ulcers, which can take months to heal and frequently present bacterial secondary infection (Figure 3). As yet there is no a specific antivenom, the unique recourse is to immerse the affected site in not scalding hot water (around 60 ° C) for 30-90 minutes, since high temperatures probably neutralize the action of toxins (there are experimental evidences of this fact) and promotes dilatation of the vessels, an inverse effect for the intense vasoconstriction observed in experimental injection of the venom in animals. The search for medical assistance must be carried out because there may be need for removal of fragments of the epithelium and/or the stinger(s), as the tetanus prevention and the use of antibiotics.

### ***Perspective***

Freshwater stingrays are not part of the native fauna of the rivers in the São Paulo State or other areas in the South and Southeast regions of Brazil. So, the species of stingrays found in the region may cause impacts unwanted. Studies of a multidisciplinary group that involves biologists, oceanographers and doctors) have shown that the adjustment of the stingrays in the new places of occurrence is quite effective, with the consumption of food items ranging from insect larvae the remains of fish discarded by fishermen. As stingrays live well in dammed water environments and has taken the paths opened by the flooded areas, it is expected that population growth and range increase, with the possibility of increasing the number of human injuries in densely populated plac-

es, where misinformation about the fish is large. Studies by GERAD try to suggest strategies to the prevention of injuries and management of stingrays, based on continuous and systematic research, which is made on Natural History, systematic, clinical aspects of envenoming and treatment and environmental education of the local population.



Figure 1: Maps of Brasil and Paraná River showing the colonization of the freshwater stingrays along the river (blue).

Figure 2: *Potamotrygon motoro* and *Potamotrygon falkneri*, two species of freshwater stingrays in the region described.

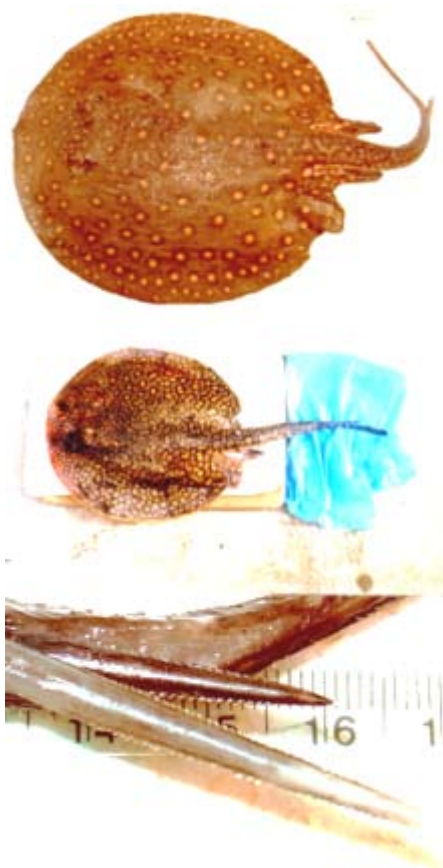


Figure 3: Envenoming and skin necrosis in a fisherman.



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## NEWS FROM THE NATURAL TOXINS RESEARCH CENTRE

The venomous snake collection of the Natural Toxins Research Center has taken up residence in its new home as of July of 2009. The move of the laboratory, offices and other equipment took approximately a week. The snakes were transferred to the new serpentarium in one day. The old serpentarium building, May Hall, which had served many uses for the college over its lifetime, was demolished this July, along with other nearby older campus buildings.

The NTRC Serpentarium staff, along with the help of workers from the Physical Plant, packed, loaded and unloaded all of the animal care and laboratory equipment for the facility. The NTRC serpentarium curator, Doug Hotle, and staff, Lucy Arispe, Juan Salinas, Clint Howell, and Nirav Turakhia have been diligently working on setting up all the equipment and making sure everything is in the most efficient location. Only workers from the NTRC were involved in the move of the animals. All 450 snake enclosures were securely fastened shut, and then loaded into an air conditioned van for transport across the campus, and then quickly unloaded into their assigned rooms.

The new building is 4,383 square feet, and was built by the Texas A&M System with a \$1.5 million budget. It contains seven rooms to house the snakes, has seven display enclosures with easy visitor viewing, dedicated rooms for support animals, a venom lab, and an office. In order to supplement the building's storage, two exterior units were placed outside to house any inventory not in daily use. A more advanced heating and ventilation and air conditioning system has been incorporated into the new building, which should be able to manage the air flow better than the previous serpentarium by keeping the animal rooms at a negative pressure. A specialized cooling system has also been set up to allow for the Hibernation room to reach temperatures down to 55° F, which would mimic the seasonal changes needed for breeding the snakes. An increased breeding program is intended to increase the populations of snake species from which venom is requested.

The display enclosures are in the process of being painted and furnished to represent the natural habitats of some of the snakes in the NTRC collection. Diane Longenecker, a zoo professional out of Abilene, Texas, is working with Doug Hotle, the NTRC Serpentarium curator, on setting up these displays.

Hotle stated of the new serpentarium, "It's a great new facility with some of the highest technology in climate control. Two of our snakes gave birth just after moving in, so I am guessing they approve as well."

An open house for the new NTRC Serpentarium is being planned for October 2009. Dr. John C. Perez looks forward to inviting Texas A&M University administration, faculty, staff, alumni and many others to visit the new facility upon it's opening.





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## Southwest Venoms

### CATALOGUE OF INSECT VENOMS (2009-2010)

Prices in U.S. dollars. All venoms are pure venoms (not venom sac or apparatus homogenates) collected according to the methods of Schmidt (1986. *In: Venoms of the Hymenoptera* [T. Piek, ed.], pp. 425-508. Academic Press: London.).

Prod. No.	VENOM	(LD <sub>50</sub> mg/kg, mice)	VENOM PRICE			
			1 mg	5 mg	25 mg	100 mg
<b>SOCIAL WASPS</b>		(LD <sub>50</sub> )				
Yellowjackets -- <i>Vespula</i>						
W-10	<i>V. pensylvanica</i>	(6.4)	50	225	1000	*
W-19	other species**		*			
Hornets -- <i>Vespa</i>						
W-20	<i>V. mandarina</i>	(4.1)	50	225	1000	*
W-21	<i>V. tropica</i>	(2.8)	50	225	1000	*
W-29	others **		*			
Paper wasps -- <i>Polistes</i>						
W-30	<i>P. comanchus navajoe</i>	(5)	40	180	800	*
W-31	<i>P. flavus</i>	(3.8)	40	180	800	*
W-32	<i>P. canadensis</i>	(2.5)	50	225	*	
W-33	<i>P. erythrocephalis</i>	(1.5)	50	225	*	
W-39	<i>Polistes</i> sp. as available**		30	135	600	2100
New World Polybiine wasps						
W-40	<i>Brachygastra mellifica</i>	(1.5)	60	270	1200	*
W-50	<i>Synoeca septentrionalis</i>	(2.7)	60	270	1200	*
W-60	<i>Parachartergus fraternus</i>	(5)	70	300	1400	*
W-70	<i>Polybia sericea</i>	(6)	80	350	*	
W-71	<i>P. simillima</i>	(4.1)	80	350	*	
W-72	<i>P. occidentalis</i>	(5)	100	*		
W-80	<i>Agelaia myrmecophila</i>	(5.6)	140	*		
Old World Polybiine wasps						
W-90	<i>Belonogaster juncea colonialis</i>	(3)	80	350	*	
<b>SOCIAL BEES</b>						
Honey bees -- <i>Apis</i>						
B-10	<i>A. mellifera</i>	(2.8)	20	90	400	1400
B-11	<i>A. mellifera</i> Africanized bees	(2.8)	20	90	400	1400
B-12	<i>A. mellifera</i> queens		40	180	800	2800
B-13	<i>A. dorsata</i>	(2.8)	50	225	1000	3500
B-14	<i>A. cerana</i>	(3.1)	55	245	*	
B-19	others ( <i>A. florea</i> , etc.)**		*			
Bumble bees -- <i>Bombus</i>						
B-20	<i>B. sonorus</i>	(12)	50	225	1000	*
B-21	<i>B. impatiens</i>	(12)	50	225	*	
B-29	other species**		30	*		

Prod. No.	VENOM	(LD <sub>50</sub> mg/kg, mice)	VENOM PRICE			
			1 mg	5 mg	25 mg	100 mg
<b>ANTS -- FORMICIDAE</b>		(LD <sub>50</sub> )				
Pogonomyrmex -- harvester ants						
A-10	<i>P. barbatus</i>	(0.6)	50	225	1000	3500
A-11	<i>P. maricopa</i>	(0.12)	60	270	1200	4200
A-12	<i>P. occidentalis</i>	(0.5)	70	315	1400	*
A-13	<i>P. rugosus</i>	(0.7)	50	225	1000	3500
A-15	<i>P. desertorum</i>	(0.7)	160	*		
A-19	<i>Pogonomyrmex</i> sp. as available		45	200	900	3200
Myrmecia -- bull ants						
A-20	<i>M. gulosa</i>	(0.18)	60	270	1200	4200
A-21	<i>M. tarsata</i>	(0.18)	60	270	1200	*
A-22	<i>M. browni</i>	(0.18)	70	315	*	
A-23	<i>M. rufinodis</i>	(0.35)	70	315	*	
A-24	<i>M. simillima</i>	(0.21)	70	315	*	
A-25	<i>M. pilosula</i>	(5.7)	100	*		
A-30	<i>Pachycondyla (Neoponera) villosa</i>	(7.5)	60	270	*	
A-31	<i>P. (Neoponera.) apicalis</i>	(> 16)	70	*		
A-32	<i>P. crassinoda</i>	(2.8)	80	*		
A-33	<i>P. (Megaponera) foetens</i> (Metabele ant)	(130)	70	315	*	
A-34	<i>P. (Paltothyreus) tarsatus</i> (stink ant)	(64)	50	225	1000	3500
A-35	<i>P. (Bothroponera) strigulosa</i>	(9)	70	*		
A-36	<i>Termitopone commutata</i>	(10)	70	315	1400	*
A-40	<i>Platythyrea lamellosa</i>	(11)	70	315	*	
A-50	<i>Diacamma</i> sp.**	(35)	100	450	*	
A-60	<i>Dinoponera gigantea</i>	(11)	60	270	1200	4200
A-70	<i>Paraponera clavata</i> (bullet ant)	(6.0)	60	270	1200	4200
A-80	<i>Ectatomma tuberculatum</i>	(1)	60	270	*	
A-81	<i>E. quadridens</i>	(17)	60	270	*	
A-90	<i>Odontomachus</i> sp.**	(33)	60	275	*	
A-110	<i>Tetraoponera</i> sp.**	(.35)	140	600	*	
A-120	<i>Streblognathus aethiopicus</i>	(8.0)	80	360	*	
<b>SOLITARY WASPS AND BEES</b>						
Spider wasps -- Pompilidae						
SW-10	<i>Pepsis</i> sp.**	(65)	60	270	1200	4200
Mutillid wasps -- Mutillidae						
SW-20	<i>Dasymutilla</i> sp.**	(71)	70	315	1400	*
SW-39	Other wasps (Scoliidae, Tiphiidae, Sphecidae, Eumenidae, etc.)**		*			
Carpenter bees -- <i>Xylocopa</i>						
SB-10	<i>X. californica</i>	(21)	50	225	1000	*
SB-11	<i>X. veripuncta</i>	(33)	55	245	*	
SB-20	<i>Proxycopa rufa</i>	(11)	100	450	*	
SB-39	Other bees**		*			

\*Inquire for prices and availability.

\*\*Available species provided; exact determinations usually included.

# Natural Toxins

Research Center  
(NTRC)

TEXAS A&M UNIVERSITY  
KINGSVILLE

## VENOM QUALITY GUARANTEE

**Authenticity of Species • Purity of Venom**  
**Maximum Biological Activity • Our Venom is Never Pooled**

**Snake venoms contain important molecules which are valuable for researching the treatments of strokes, heart attacks, and cancer.**

The Natural Toxins Research Center (NTRC) at Texas A&M University-Kingsville is dedicated to providing high quality snake products for biomedical research. We are committed to the procurement and distribution of venoms, venom fractions and tissue for biomedical research. Venoms from the same species can be different, and therefore extracted venoms are never pooled. Each vial contains venom from a single snake, and venoms of the same species are never mixed. The vials are labeled with the snakes' scientific and common names, ID tag number and sex. The ID tag number can be traced back to the NTRC Internet Database ([ntrc.tamuk.edu/cgi-bin/serpentarium/snake.query](http://ntrc.tamuk.edu/cgi-bin/serpentarium/snake.query)) for additional information about each snake.

Southern Copperhead - <i>Agkistrodon contortrix contortrix</i> .....	\$75.00/1g	.....	\$50.63/500mg			
Broad-Banded Copperhead - <i>Agkistrodon contortrix laticinctus</i> ..	\$100.00/1g	.....	\$67.50/500mg			
Northern Copperhead - <i>Agkistrodon contortrix mokasen</i> .....	\$50.00/1g	.....	\$33.75/500mg			
Trans-Pecos Copperhead - <i>Agkistrodon contortrix pictigaster</i> ....	\$75.00/1g	.....	\$50.63/500mg			
Florida Cottonmouth - <i>Agkistrodon piscivorus conanti</i> .....	\$60.00/1g	.....	\$40.50/500mg			
Western Cottonmouth - <i>Agkistrodon piscivorus leucostoma</i> .....	\$56.00/1g	.....	\$37.80/500mg			
Eastern Diamondback Rattlesnake - <i>Crotalus adamanteus</i> .....	\$50.00/1g	.....	\$33.75/500mg			
Western Diamondback Rattlesnake - <i>Crotalus atrox</i> .....	\$45.00/1g	.....	\$30.38/500mg			
Sonoran Sidewinder - <i>Crotalus cerastes cercobombus</i> .....	\$125.00/1g	.....	\$84.38/500mg			
Timber Rattlesnake - <i>Crotalus horridus</i> .....	\$70.00/1g	.....	\$47.25/500mg			
Mottled Rock Rattlesnake - <i>Crotalus lepidus lepidus</i> .....	\$125.00/1g	.....	\$84.38/500mg			
Blacktail Rattlesnake - <i>Crotalus molossus molossus</i> .....	\$400.00/1g	.....	\$270.00/500mg	\$72.90/100mg	\$49.21/50mg	
Great Basin Rattlesnake - <i>Crotalus oreganus lutosus</i> .....	\$125.00/1g	.....	\$84.38/500mg			
Grand Canyon Rattlesnake - <i>Crotalus oreganus abyssus</i> .....	\$250.00/1g	.....	\$168.75/500mg	\$45.56/100mg	\$30.75/50mg	
Texas Coral Snake - <i>Micrurus tener tener</i> .....	\$2000.00/1g					
Florida Coral Snake - <i>Micrurus fulvius</i> .....	\$1800.00/1g					
Southern Pacific Rattlesnake - <i>Crotalus oreganus helleri</i> .....	\$400.00/1g	.....	\$270.00/500mg	\$72.90/100mg	\$49.21/50mg	
Northern Pacific Rattlesnake - <i>Crotalus oreganus oreganus</i> .....	\$400.00/1g	.....	\$270.00/500mg	\$72.90/100mg	\$49.21/50mg	
Mohave Rattlesnake - <i>Crotalus scutulatus scutulatus</i> (A) .....	\$250.00/1g	.....	\$168.75/500mg	\$45.56/100mg	\$30.75/50mg	
Mohave Rattlesnake - <i>Crotalus scutulatus scutulatus</i> (B) .....	\$1000.00/1g	.....	\$675.00/500mg	\$182.25/100mg	\$123.02/50mg	\$33.22/10mg
Prairie Rattlesnake - <i>Crotalus viridis viridis</i> .....	\$70.00/1g	.....	\$47.25/500mg			
Red Spitting Cobra - <i>Naja pallida</i> .....	\$100.00/1g	.....	\$67.50/500mg			
Desert Massasauga - <i>Sistrurus catenatus edwardsii</i> .....	\$1000.00/1g	.....	\$675.00/500mg	\$182.25/100mg	\$123.02/50mg	\$33.22/10mg
Western Massasauga - <i>Sistrurus catenatus tergeminus</i> .....	\$1000.00/1g	.....	\$675.00/500mg	\$182.25/100mg	\$123.02/50mg	\$33.22/10mg
Bushmaster - <i>Lachesis muta muta</i> .....	\$2000.00/1g	.....	\$1350.00/500mg	\$364.50/100mg	\$246.04/50mg	\$66.43/10mg

(A) - neurotoxic venom  
(B) - non-neurotoxic venom  
\*Subject to availability

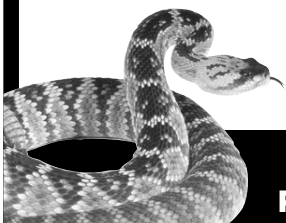
Venom is collected under stringent laboratory conditions using disposable labwear for each extraction. Venom is collected in new, non-reusable plastic cups with parafilm coverings. Snakes are allowed to bite into the parafilm diaphragm and the venom glands are not massaged. Immediately following collection, each venom sample is clarified by centrifugation at 500 x g for 5 minutes to remove cellular debris and frozen at -90° C until lyophilized.

**Foreign Investigators:** Please note that your order may be subject to import duties, taxes, tariffs, customs charges, DDP, VAT, and the like, once your package reaches your country. It is your responsibility to pay for these charges. The Natural Toxins Research Center will not be responsible for paying these charges, and we will not bill you for such charges when you place your order.

**Venom glands and fractions also for sale - call for pricing & availability**

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**Phone: (361) 593-3082 • Fax: (361) 593-3798 • Email: [kanmd00@tamuk.edu](mailto:kanmd00@tamuk.edu)**





# Venom Supplies Pty Ltd

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Phone 08 8563 0001  
+61 8 8563 0001  
Fax 08 8563 0020  
+61 8 8563 0020

Email: [venoms@venomsupplies.com](mailto:venoms@venomsupplies.com)

Web: [www.venomsupplies.com](http://www.venomsupplies.com)

## Lyophilised Venoms

### Snakes

#### Scientific name

#### Price(US\$)/200mg

#### Price(US\$)/gm

<i>Acanthophis antarcticus</i>	\$170	\$745
<i>Acanthophis praelongus</i>	\$210	\$845
<i>Agkistrodon billineatus</i>	\$50	\$200
<i>Austrelaps superbus</i>	\$400	\$1,600
<i>Austrelaps labialis</i>	\$700	\$3,000
<i>Bitis arietans</i>	\$70	\$300
<i>Bitis rhinoceros</i>	\$75	\$340
<i>Bitis nasicornis</i>	\$75	\$340
<i>Bothriechis schlegelii</i>	\$200	\$850
<i>Crotalus adamanteus</i>	\$100	\$450
<i>Crotalus unicolor</i>	\$200	\$900
<i>Crotalus vegrandis</i>	\$160	\$700
<i>Hoplocephalus stephensii</i>	\$220	\$900
<i>Hoplocephalus bitorquatus</i>	\$220	\$900
<i>Naja kaouthia</i>	\$60	\$250
<i>Naja melanoleuca</i>	\$50	\$200
<i>Naja mossambica</i>	\$60	\$250
<i>Naja siamensis</i>	\$60	\$250
<i>Notechis ater humphreysi</i>	\$350	\$1,600
<i>Notechis ater niger</i>	\$350	\$1,600
<i>Notechis ater serventyi</i>	\$350	\$1,600
<i>Notechis scutatus</i>	\$300	\$1,445
<i>Ophiophagus hannah</i>	\$200	\$850
<i>Oxyuranus microlepidotus</i>	\$300	\$1,300
<i>Oxyuranus scutellatus</i>	\$260	\$1,250
<i>Oxyuranus scutellatus canni</i>	\$400	\$1,500
<i>Pseudechis australis</i>	\$110	\$520
<i>Pseudechis butleri</i>	\$160	\$700
<i>Pseudechis colletti</i>	\$110	\$500
<i>Pseudechis guttatus</i>	\$110	\$500
<i>Pseudechis porphyriacus</i>	\$140	\$650
<i>Pseudechis papuanus</i>	\$288	\$1,380
<i>Pseudonaja affinis</i>	\$800	\$3,900
<i>Pseudonaja aspidorhyncha</i>	\$800	\$3,990
<i>Pseudonaja inframacula</i>	\$800	\$3,990
<i>Pseudonaja nuchalis</i>	\$800	\$3,990
<i>Pseudonaja textilis</i>	\$760	\$3,700
<i>Tropidechis carinatus</i>	\$300	\$1,500

### Spider Venom

*Lampona cylindrata*

\$360 / 10sac contents \$720 / 25sac contents

*Latrodectus hasseltii*

\$500/50 sac contents.

### Bee Venom

Pure bee venom (*Apis mellifera*)

250mg	\$58
(1-5gm)	\$130/gm
(6-10gm)	\$116/gm
(60gm and over)	\$95/gm

### Amphibian Venoms

*Bufo marinus*

\$95/200mg \$450/gm

5% discount will apply for all orders over 5 gm and 7% will apply to orders over 15gm for venoms produced at Venom Supplies Pty Ltd.

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**386-740-9143**  
**Fax: 386-734-4163**  
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Naja nivea	\$205.00
Naja melanoleuca	\$205.00
Naja nigricollis (Tanzania)	\$205.00
Naja nigricollis (Ghana)	\$205.00
Naja h. annulifera	\$125.00
Naja kaouthia	\$205.00
Naja naja (Pakistan)	\$250.00
Ophiophagus hannah	\$150.00
Micrurus f. fulvius	\$2100.00
Bitis arietans	\$150.00
Bitis g. gabonica	\$150.00
Bitis g. rhinoceros	\$150.00
Crotalus adamanteus	\$150.00
Crotalus atrox	\$150.00
Crotalus h. atricaudatus	\$150.00
Crotalus h. horridus	\$150.00
Crotalus s. scutulatus	\$450.00
Crotalus d. terrificus	\$450.00
Sistrurus m. barbouri	\$450.00
Agkistrodon c. contortrix	\$190.00
Agkistrodon c. laticinctus	\$190.00
Agkistrodon c. mokasen	\$100.00
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 Special orders to meet research needs

Exact locality data on most species available, Species are guaranteed

Prices are quoted per gram in U.S. dollars, subject to change without notice

Payment terms net 30 days check, money order, or wire transfer

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crystallized venoms**

<b>Bothrops alternatus</b>	<b>1440,00 US\$</b>
<b>Bothrops jararaca</b>	<b>220,00 US\$</b>
<b>Bothrops jararacussu</b>	<b>264,00 US\$</b>
<b>Bothrops moojeni</b>	<b>300,00 US\$</b>
<b>Bothrops neuwiedi</b>	<b>340,00 US\$</b>
<b>Crotalus durissus terrificus</b>	<b>220,00 US\$</b>
<b>Crotalus durissus collineatus</b>	<b>300,00 US\$</b>

**Lachesis muta muta** 600,00 US\$

**Bufo marinus / schneideri** 264,00 US\$

**All venoms collected in a sterile manner**

**Blood cells and freeze dried blood plasma from snakes**

**We have also other proteins, aminoacids and toxin polyclonal antibodies from Brazilian snakes**

**We trade or sale our products only with CITES from the IBAMA (Brazilian Environment Agency & Wildlife)**

**Prices quoted per gram in US\$. Transport FOB**

**Brazilian Contact:**

**Sanmaru Serpentarium,**

**Rod. Brig. Faria Lima km 365**

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