



INTERNATIONAL SOCIETY ON TOXINOLOGY

NEWSLETTER

April 2011

UPCOMING MEETINGS

Asia-Pacific Section IST

The next meeting of the Asia-Pacific Section of the IST will be in Vladivostock, Russia, in September 4-8, 2011, at the Conference Hall of the Primorsky Region Administration (details to be posted later). Organising Committee Chairmen are; Prof. Eugene Grishin and Prof. Valentin Stonik..

European Section IST

September 11-15, 2011, Valencia, Spain. A web site detailing the Congress is now online at <http://istmeetingvlc2011.ibv.csic.es/>. Further information is found later in this Newsletter. For details contact catedrasg@cac.es

IST World Congress

Hawaii, July 8-13, 2012, details pending. This Congress will combine with the US Venom Week meeting.

4th Venoms to Drugs Conference

May 15-20, 2011, Heron Island, Australia. The web site is www.venomstodrugs.com. More information in this Newsletter.

XXXI International Congress of the European Association of Poisons Centres and Clinical Toxicologists

24-27 May 2011, Dubrovnik, Croatia, at the Valamar Lacroma Resort Hotel

Plus see later in this newsletter for other meetings scheduled in the next few months.

FROM THE IST EXECUTIVE

The IST is preparing for two regional meetings this year, both in September, the Asia-Pacific Section Congress in Vladivostock, immediately followed by the European Section Congress in Valencia. A "First Announcement" brochure for the Valencia meeting is available on the IST website and in this Newsletter.

In the last few months notices for IST dues have been sent to IST members, in most cases for 2010 and 2011. For some members this included 2009 as well. As mentioned in these notices, the IST dues system is complex and difficult to manage, because some members pay via Elsevier (including a subscription to Toxicicon) while others pay the IST directly. Currently this is through the Women's & Children's Hospital (CYWHS) in Adelaide, since that is the base for the Secretary/Treasurer. As you may already know, this facility will soon become unavailable for IST dues collection and satisfactory new arrangements are yet to be found. This has important implications for members.

Both IST Congresses in 2011 will offer substantial discount registration fees for financial members of IST. Those members who have not paid their membership dues by the end of April, or possibly sometime in May, will then be listed as unfinancial and will not be able to register at these preferential rates. Because payments after this time will likely not be practical, later payment of dues will not be possible.

So, to paraphrase the pubs "last drinks please", it is "last dues payments please"!

Julian White, Secretary/Treasurer, IST

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MESSAGE FROM THE PRESIDENT (I.S.T)



energize IST.

The Global snake bite initiative (GSI) small grants have been reviewed and the results should be out soon.

In September 2011, we will have two regional IST Meetings, A-P I.S.T will be in Vladivostok and E.I.S.T will be in Valencia back to back. This type of overlap could have been avoided according to some members. It is up to the membership to raise these concerns at an early stage so that they could be rectified.

The Student Interest Group is growing and I hope there will be some representatives in Vladivostok and in Valencia so that some discussions could be started and a formal discussion could occur in Hawaii.

I urge the members to tell the Executive and the Council

members what they want and what they expect in IST; if the views and ideas are forthcoming then it will give impetus for us to have active involvement in the running and improvement of IST.

We also must think of ways and means of engaging toxinologists from China and India into the IST folder as well as other BRICS Countries (Brazil, Russia, South Africa) where the economic landscape is changing and they have significant clinical toxicological problems and they are putting resources to look into these problems. I hope we will have more participation and membership from these countries and also into Council membership.

Gopal

Email: antgopal@nus.edu.sg

Dear Friends and Colleagues of IST,

I am happy to send another message at a time when there are sweeping changes taking place in many parts of the world, politically, socially and economically. I hope that this type of change will occur in IST as well. As members of the IST we must take part in active discussions and be a part of the process of change and en-

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

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)
Dr Florence Jungo, Switzerland (Email: Florence.Jungo@isb-sib.ch)
Dr Evanguedes Kalapothakis, Brazil (Email: ekalapo@icb.ufmg.br)
Prof. Glenn King, Australia (Chairman; Email: glenn.king@imb.uq.edu.au)
Prof. Manjunatha Kini, Singapore (Email: dbskinim@nus.edu.sg)
Prof. Graham Nicholson, Australia (Email: graham.nicholson@uts.edu.au)
Prof. Toto Olivera, USA (Email: olivera@biology.utah.edu)
Prof. Jan Tytgat, Belgium (Email: 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.

The IST has established a special wiki site for members of this Nomenclature Committee to use to both communicate and develop information and recommendations. Members of the committee will soon receive an email detailing how they may access this site.

IST Snake Taxonomy Advisory Group

Keeping up with changes in taxonomy for venomous animals is always a challenge for toxinologists, but it is important to do so, if published research is to maintain viability longer term, as taxonomy evolves. To improve dissemination of information on taxonomic changes the IST is trialling an internet-based process for taxonomists to interact through.

The first stage is a small invited group of experts on snake taxonomy, who can interact through a special wiki site and develop updates and recommendations for dissemination to all IST members through the main IST website or the Newsletter. This group is in its formative stages at present and our experiences with this will be used to guide establishment of similar groups in the future to cover other areas of taxonomy, such as scorpions, spiders, marine organisms etc.

Once this early stage has allowed us to develop a viable structure and processes the IST will invite members to submit names of taxonomists in each major taxa who could then be approached re involvement in this initiative. Until then I ask that members do not send me names or indicate their own interest in this area, but rather allow me to work with this initial trial group to iron out details of how to make the process deliver results.

Julian White, Secretary IST

A DISTINGUISHED IST MEMBER RECEIVES A MAJOR AWARD

Cesare Montecucco from the University of Padova, Italy, and Redi Award recipient of IST, was awarded the prestigious Paul Ehrlich and Ludwig Darmstaedter Prize 2011 on March 14 in Frankfurt, Germany, for his work on the mode of action of neurotoxins, among them tetanus as well as botulinum toxins. The Prize is considered as the German equivalent of the Nobel Prize. The International Society on Toxinology congratulates Prof. Montecucco for this great honor.

In his laudatory speech Prof. Rino Rappuoli described the importance of Prof. Montecucco's outstanding achievements as follows:

In science there are two fundamentally different ways to go and solve important problems: one is to have a lot of resources, an army of scientists and the most sophisticated technologies and equipment and fundamental questions; the other is to have a very small laboratory and to focus on molecules that for their nature target fundamental scientific mechanisms. Cesare Montecucco belongs to the latter category of scientists. He had and still has a small laboratory at the University of Padova in Italy, one or two brilliant students and decided to focus on toxins produced by bacteria, snakes and scorpions.

Why toxins? Because these are the most efficient molecular nano-machines selected by evolution. In nanogram quantities they are able to kill large animals and humans. In order to be so efficient, during evolution these toxins have learned to attack the most essential molecules of our cells. Therefore, Cesare Montecucco thought if he was able to understand the mechanisms by which these toxins kill human cells he would very likely make a fundamental discovery about human cells. That is exactly what happened. In the early 1980s Cesare was very busy studying toxins from *Corynebacterium diphtheriae*, *Clostridium tetani* and *Clostridium botulinum*, the bacteria that cause diphtheria, tetanus, botulinum, respectively. He was also working on scorpion and snake toxins. In each of these fields Prof. Montecucco made fundamental discoveries, but in the early 1990s he succeeded to make one of the most important discoveries in biology.

While he was looking at the recently published sequence of the gene of the tetanus toxin, he found that the sequence contained the amino acids HEXXH, typical of zinc-binding motif of metalloproteases. He immediately realized that the toxin was very likely an enzyme, acting as a scissor, cleaving a molecule essential for the release of vesicles containing the neurotransmitters. He went back to the laboratory, isolated the secretory vesicles, treated them with tetanus toxin and looked for molecules that had been cleaved by the treatment of the toxin. As predicted, he found that one membrane protein, named VAMP/synaptobrevin was cleaved into two fragments by treatment with tetanus toxin. Finally, he had solved a mystery of centuries! He had found that tetanus toxin is so powerful because it cleaves and inactivates one protein of our nerve cells that is essential for the release of vesicles containing neurotransmitters.

This finding immediately showed that synaptobrevin, the newly discovered molecule, to be very important in human cells. In fact, two other laboratories in California run by Randy Sheckman and the other run by Jim Rothman at Rockefeller University had been working for 20 years using genetic and biochemical methods to understand the traffic of vesicles in cells. The discovery that cleavage of synaptobrevin was enough to jam the vesicle traffic in a cell, was like the discovery of the Rosetta Stone [an ancient Egyptian stele inscribed with a text in Egyptian hieroglyph, demotic and Greek language enabling the deciphering of the hieroglyphs]. Immediately all the work of Jim Rothman and Randy Sheckman made sense, the puzzle of their work was assembled showing the beautiful picture of how organelles are organized within cells, how cells manufactured and secrete proteins like insulin and growth hormones that govern metabolism or how brain cells discharge the chemical transmitters that mediate thought, feeling and movement.

Indeed we cannot conceive a cell without thinking at the fundamental processes that were discovered by learning the mechanisms of action of tetanus toxin. Jim Rothman and Randy Sheckman received the Lasker award in 2002 for their discoveries. Today we are pleased to recognize Prof. Montecucco for making all this possible.

Report on behalf of IST by Prof. Dr. Dietrich Mebs, past Secretary/Treasurer, IST.



Photo: Prof. Cesare Montecucco at the ceremony to mark the award of the Paul Ehrlich and Ludwig Darmstaedter Prize and Dr. Stephan Grill (right), recipient of the young researcher award.

The following is reproduced from the IST Journal, *Toxicon*, to inform members about the passing of a distinguished member and to remember the important contributions he made to our field of science.

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Toxicon xxx (2011) 1–2

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Toxicon

journal homepage: www.elsevier.com/locate/toxicon

Obituary

Obituary Nobuo Tamiya (1922–2011)



Nobuo Tamiya (Photo: J.M. Grognet).

It was in the late 1960s when I first met Nobuo Tamiya. He came from Paris and was on his way to Japan, made a stopover in Frankfurt and visited our institute. I was a young university assistant curious to get first hand information about snake toxins from him. Nobuo showed us impressive slides about his work on sea snake venoms. I remember a slide where he was holding a large *Laticauda* snake. He assured us that the snake was alive. He topped his talk when he mentioned that a sea snake, he was keeping as a pet in his lab, had escaped from the aquarium. When searching for the snake he finally found it under his desk. Horror-stricken we were and knowing the high lethality of the snake's venom we asked him, what kind of precautions he usually made. "Nothing" he replied, "because they never bite". I kept this remark in my mind, but was still hesitating when I caught my first sea snake many years later in Palau, Micronesia. Nobuo Tamiya died on January 19, 2011 at the age of 88.

Nobuo Tamiya was born on July 7, 1922 in Tokyo. He studied chemistry at the Tokyo Imperial University and after to Bachelor of Science 1944, he entered the Graduate School of the University where he worked shortly as assistant professor in the Department of Biochemistry. Soon he was drafted for military service to join the marine student reserves. Nobuo rarely spoke about this time when he saw so many of his fellow students senselessly sacrificing their life for the emperor and the country in the last months of the war.

When the war was over, he returned to the University of Tokyo, completed his thesis and received his PhD in November 1954. He was appointed associate professor in the laboratory of Prof. Shiro Akabori, a famous protein chemist. Like many of the generation of scientists in post-war Japan he went overseas as postdoc and spent a year (1955–1956) in Hans Krebs' lab, the Nobel laureate in medicine 1953, at the University of Oxford, England, and another year (1956–1957) in New York at the Columbia University in the lab of D. Rittenberg. These years certainly contributed to Nobuo's attitude to welcome and care for international contacts and cooperation.

When he returned to Japan, he became professor at the Tokyo Medical and Dental University and in 1965 he moved to the Tohoku University in Sendai, where he was Professor at the Department of Chemistry till his retirement in 1985.

In 1966 Nobuo and his coworker H. Arai published a paper on the crystallization of erabutoxins a and b (*Biochem. J.* 99, 624–630), "short" (62 amino acids) neurotoxins from the venom of the sea krait *Laticauda semifasciata*, which specifically act on the acetylcholine receptor of the motor nerve endplate. It laid the basis for a series of studies such as on the immunological properties of snake venom neurotoxins (with André Ménez) and provided Barbara Low with the chance to determine the three-dimensional structure of erabutoxin b by x-ray diffraction analysis (*Proc. Natl. Acad. Sci. USA* 73, 2991–2994, 1976). This was also an important step forward in understanding the interaction of those toxins with the ACh-receptor, which finally enabled Jean-Pierre Changeux to elucidate the molecular structure of the receptor (*Science* 225, 1335–1345, 1984).

When I was in Japan working on the amino acid sequence of α -bungarotoxin at the Institute of Protein Research in Osaka 1970/1971, I visited Nobuo's lab in Sendai, one of the "hot-spots" of snake toxin research at this time. I stayed in his home and was amazed to find in the bathroom a couple of gel filtration and ion-exchange columns used to fractionate sea snake venom. When discussing our work and particularly manual Edman degradation, we never agreed whether the identification of PTH-amino acids by thin-layer

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chromatography or by amino acid analysis of the residual peptide is better or not. Today protein chemists may not understand such problems when they rely on their automatic machines.

One early morning looking out of the window, I felt to be back in the time of “old Japan”. Nobuo dressed in traditional garments was standing in his garden practicing “kyudo”, the Japanese art of archery. When I asked him what object he is targeting he explained to me that his performance emphasizes on form and etiquette rather than of accuracy. He joked that he would not compete with the medieval warriors, the samurai.

Collecting sea snakes for extracting their venom, Nobuo considered this as the most pleasant part of his research activities. He joined several expeditions such as to the Timor Sea, Australia, New Caledonia, Fiji, Vanuatu, Tonga, Samoa, Niue etc. The late André Ménez, who has been in Nobuo's lab in 1974 and 1979/1980, participated in several of these journeys. During a collecting trip to Niue André was bitten by a sea snake. Of course, no antivenom was available. However, André survived, either the snake hadn't injected venom or it was rather weak. But Nobuo who kept watching the peacefully sleeping victim all night, mentioned next morning that he most feared “that I have to kiss you” meaning mouth-to-mouth resuscitation in case of respiratory arrest. André described it as a personally great experience to work with Nobuo when he showed him how to milk a snake and how to analyze the venom.

Nobuo's work was honoured by an award of the Chemical Society of Japan (1970), the “Ordre des Palmes Académique” of France (1980), by the Redi-Award of the International Society on Toxinology (1984), the “Medal with Purple Ribbon” and the “Order of the Sacred Treasure, Gold and Silver Star” from his government.

It was always a pleasant experience meeting Nobuo and his wife Nakako. With my other Japanese friends they stimulated my affection for Japan I also shared with André. We were able to make jokes about typical Japanese behavior and strange traditions as well as exchanging critical views about our western lifestyle. Since both of us had experienced western and eastern life as well, we regarded the cultural background of each of us with deep respect.

The International Society on Toxinology lost one of its pioneers in toxin research, I will miss a great mentor and friend.

Dietrich Mebs*

*Institute of Legal Medicine, University of Frankfurt,
Kennedyallee, 104 60596 Frankfurt, Germany*

* Tel.: +49 69 6301 7573; fax: + 49 69 6301 5882.

E-mail address: mebs@em.uni-frankfurt.de (D. Mebs)

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Available online xxx

CONCO: the cone snail genome project for health

Dietrich Mebs and Reto Stöcklin

February 1, 2007 marked the beginning of one of the most ambitious toxinology projects of the European Union: with the title: "Applied venomomics of the cone snail species *Conus consors* for the accelerated, cheaper, safer and more ethical production of innovative biomedical drugs" abbreviated with CONCO as project acronym. At the beginning of June 2007, 20 partners from universities and private companies assembled in Paris for the kick-off meeting. This team of European and American researchers accepted the challenge to explore the genome and venom of marine cone snails as well as their phylogeny, ecology and the general biology of these snails for the discovery and development of novel drugs. The international research project is supported by the European Union with more than 11 million EURO over five years.

Since the pioneering work of (Toto) Baldomero Olivera and of his co-workers, cone snails and the story concerning their venom are well known to most toxinologists. But why are these molluscs so interesting? More than 750 species of these carnivorous snails exist, which vary considerably in size and colour patterns of their shell, but all share one characteristic feature: a particular mode to capture prey. With a small arrow or harpoon, a modified tooth of the radula, they inject venom into their prey, which paralyzes fish, worms or other snails within seconds. Besides large proteins (enzymes) cone snail venom consists of numerous linear small peptides, strongly folded mini-proteins, named conotoxins or conopeptides, which specifically act on the nervous system. In the venom of a single cone snail more than 2.000 peptides have been detected with modern analytical methods such as mass-spectrometry. Combined, they represent an extremely efficient venom cocktail, while taken individually they offer highly interesting natural products for the researcher. One of these peptides has been successfully developed as a highly effective drug to treat chronic pain (Prialt™) which originates from the venom of the cone snail *Conus magus* (the magician's cone), and a few others are currently undergoing pre-clinical or clinical trials. The multitude of conopeptides in the cone snail venoms offers huge opportunities for the development of novel biopharmaceuticals.

The high biodiversity of the cone snails raises many questions: What is the genetic basis of this diversity, how are these many species related? How diverse and variable is their venom composition? Considering only 200 different peptides in a single venom, about 150.000 of these compounds may exist in the venoms of the 750 *Conus* species. Indeed, a great challenge for researchers.

In the frame of CONCO the genome, venom gland transcriptome and venom proteome of *Conus consors* are exhaustively studied. This is the first integrated Venomomics project with the aim to better understand how the venomous system works, what drives and determines venomousness in animals. This project involves also the prestigious J. Craig Venter Institute in Rockville, USA, where the human genome had been elucidated. With modern analytical techniques and methods the chemical structure of the conopeptides are investigated and their biological activities are tested on a variety of physiological targets with potential therapeutic value, such as on nervous membranes, isolated receptors and ion channels. The active peptides are chemically synthesized, modified and further evaluated as potential drug candidates.

One lead compound, XEP-018 has already been identified in the venom of *Conus consors*, a μ -conopeptide selectively targeting Nav 1.4 ion channels at the neuromuscular junction with high potency, selectivity and unprecedented prolonged mode of action. Different drug discovery and development approaches were initiated with academic and industrial partners, such as based on target-driven cell-based and enzymatic assays that led to the identification of several innovative hits, structure-function studies with 3D investigation of XEP-018 by NMR and exhaustive pharmacological profiling of the compound for preclinical development have been performed.

Research on the biodiversity of cone snails will also contribute to our knowledge on the ecology and evolution of this mollusc family and their venom emphasizing also the need for their protection.

A major part of the CONCO-project is dedicated to education and knowledge dissemination through the publication of articles, press releases, presentation of the project in radio and television, participation in scientific and public exhibitions and conferences and by providing training courses for our students and co-workers.

For this project a non-profit foundation has been created in Geneva, the Toxinomics Foundation (see below), which is entirely new for an EU-project. The Foundation is not only in charge of all communication and education aspects, it also controls and valorizes the results and provides protection of the new data obtained by the research groups. Most importantly, the Foundation is in charge of the pre-clinical development of the Consortium's lead compound and is also looking for other opportunities around the world.

For further information see www.conco.eu or contact Reto Stöcklin (reto.stocklin@atheris.ch) or Dietrich Mebs (mebs@em.uni-frankfurt.de).

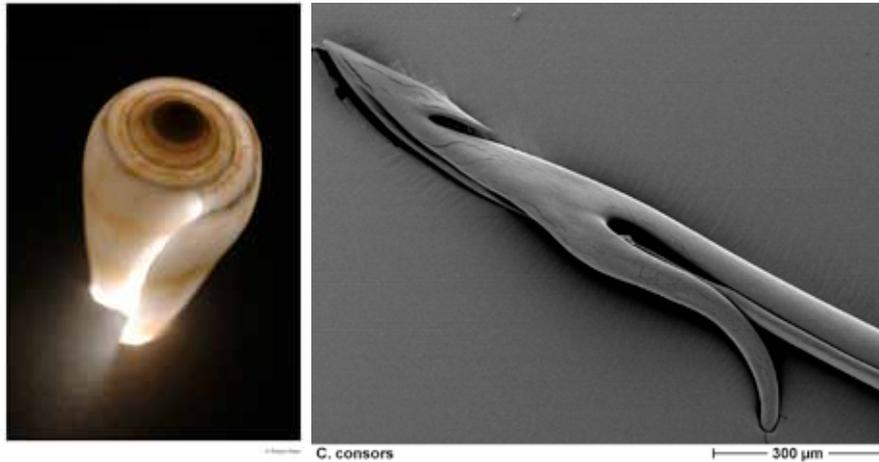
See also some recent publications:

- Biass, D., Dutertre, S., Gerbault, A., Menou, J.-L., Offord, R.E., Favreau, P. and Stöcklin, R. (2009). Comparative proteomic study of the venom of the piscivorous cone snail *Conus consors*. *J. Proteomics* **72(2)**:210-218.
- Favreau, P. and Stöcklin, R. (2009). Marine snail venoms: use and trends in receptor and channel neuropharmacology. *Curr. Opin. Pharmacol.* **9(5)**:594-601.
- Dutertre, S., Biass, D., Stöcklin, R., Favreau, P. (2010). Dramatic intraspecimen variations within the injected venom of *Conus consors*: an unsuspected contribution to venom diversity. *Toxicon* **55(8)**:1453-62.
- Kaufenstein, S., Port, C., Kendel, Y., Wunder, C., Nicke, A., Kordis, D., Favreau, P., Koua, D., Stöcklin, R. and Mebs, D. (2011). Venomic study on cone snails (*Conus* spp.) from South Africa. *Toxicon*, **57(1)** :28-34.
- Stöcklin, R. and Vorherr, T. (2010). Venoms - a natural source for mini-protein drugs. *Pharmanufacturing: The international peptide review (Sept. 2010)*:44-46.
- Stockwell, T., Baden-Tillson, H., Favreau, P., Mebs, D., Ducancel, F. and Stöcklin, R. (2010). Sequencing the genome of *Conus consors*: preliminary results. In *Advances and new technologies in Toxinology*. Barbier J, Benoit E, Marchot P, Mattéi C and Servent D (eds) pp 11-16. *Epub on <http://www.sfet.asso.fr>*.

The Toxinomics Foundation

In June 2006, just three years after the initial launch of the Venomics Initiative, André Ménez, Reto Stöcklin and Dietrich Mebs came together in Geneva, Switzerland, to create the Toxinomics Foundation. The goal of this Foundation is to promote the knowledge on animals, plants and micro-organisms producing toxins and related substances for the benefit of mankind and nature. A major objective is to support scientific research, medical development, education and communication.

The Toxinomics Foundation is a legal non-profit entity. In particular, the Foundation aims at serving in projects dealing with toxins to help facilitating the development of toxins or related substances as potential drugs. In this respect the Toxinomics Foundation will assist in identifying intellectual property rights, their protection and exploitation. It will also help in commercialisation of new toxin related products such as in patentability, out-licensing and searching for potential licensing opportunities. More precisely, the Toxinomics Foundation can be officially involved as a partner in any public or



Conus consors and its arrow for injecting venom.

private application, where it can play the role of a technology transfer office, to help discoverers to develop their toxin-related products and to assist in communication and educational aspects. The Foundation is also a privileged partner enabling access to academic and industrial networks.

The Toxinomics Foundation will also aim at promoting the protection of toxin-producing organisms, with a special focus on venomous animals.

The Toxinomics Foundation is a neutral entity registered in Switzerland. It is represented by the President, Dietrich Mebs, the Vice-President, George Miljanich, and the General Secretary, Reto Stöcklin. A Council participates as Advisory Board Members in the various activities of the Foundation.

See: Ménez, A., Stöcklin, R. and Mebs, D. (2006). 'Venomics' or: The venomous systems genome project. Editorial. *Toxicon* 47(3):255-259.

For further information see: www.toxinomics.org



Members of the CONCO-team at the kick-off meeting in Paris, June 2007.

GLOBAL SNAKEBITE INITIATIVE NEWS

Report from Dr. David Williams

(repeated from the last Newsletter, with an annotation by the Editor)

I would like to take the time to bring IST members up to date with some of the developments regarding the Global Snakebite Initiative. In particular:

GSI Small Grants Scheme

The Global Snakebite Initiative announced its first round of the "GSI Small Grants Scheme" in November 2011. CSL Limited, Australia's antivenom manufacturer very kindly, and very generously, donated USD\$10,000 to the Global Snakebite Initiative in order to enable us to launch this Scheme, which will offer a number of small project grants to applicants from developing nations. The GSI Small Grants Scheme is a programme designed to stimulate young researchers and clinicians in developing nations to become actively involved in snake bite prevention, treatment, rehabilitation and both epidemiological and clinical research. The scheme will initially provide five annual awards of USD\$2,000 to candidates whose project proposals are ranked highest among all of the applications received. Recipients of awards will be mentored throughout the duration of their projects by volunteer advisors affiliated with the Global Snake Bite Initiative, and will be required to publish either a research paper or a report about their project. I hope that you will all welcome this exciting first project by the Global Snakebite Initiative. We will need your support and assistance to make this a successful grant scheme. Volunteers with specific expertise in areas relating to the chosen projects will be needed to mentor grant recipients throughout their work, to offer, encouragement, advice and the guidance needed to help ensure successful outcomes from their efforts. Applications for the first round close on 31 January 2011, and the successful grantees will be notified at the end of March. These grants will hopefully continue through annual rounds, and as the GSI obtains more supporters and sponsors, we hope to increase the size of the grants to enable much larger projects to be considered.

EDITORS NOTE: This first round of the grant scheme has now closed and the significant number of applications received are being reviewed to allow selection of the 5 successful applications. Hopefully the next IST Newsletter will have details of those successful projects and we then can look forward to following their progress.

Establishment of a Legal Entity

For some time now we have been examining options for taking the concept of a Global Snakebite Initiative (GSI) and turning it into a legally recognised Entity that would be able to obtain funding, and to undertake projects. The key consideration was that the form which GSI takes must be transparent, accountable and subject to lawful external governance. Secondary to this is the need to register GSI as an approved charitable institution for fund-raising purposes.

Since GSI has no current administrative funding we contacted a number of legal firms about the possibility of engaging their services on a pro bono basis. We were ultimately successful in being offered the services of Norton Rose Australia, who are part of the international Norton Rose Group (<http://www.nortonrose.com>), head-quartered in London, UK. The firm has a solid track record of corporate giving and social responsibility activities. Norton Rose has the largest international legal practice in Australia, but more importantly they operate in every continent in the world, and thus are strategically positioned to be of enormous assistance to GSI as it groups from an idea into a flourishing organisation. Our arrangement with Norton Rose provides GSI with free legal services, excluding third party disbursements, such as fee payments to the Australian Securities & Investments Commission (ASIC) or Australian Taxation Office (ATO). The costs of any likely disbursements are advised to us in advance, but from the details we have been given to date, immediate costs are

expected to be less than A\$500.00.

We have asked Norton Rose for professional assistance or advice with regard to:

1. Establishment of the GSI as an approved charitable institution under Australian Law in the first instance;
2. Communicating with the ATO in relation to pre-approval for registration as an Income Tax Exempt Charity (ITEC) and a Deductible Gift Recipient (DGR). The ITEC scheme enables an entity to operate free from the requirement to pay Income Tax, while the DGR scheme enable eligible organisations to be registered to receive tax deductible donations from members of the public;
3. Communicating with the Australian Minister for Foreign Affairs regarding approval from the Minister to participate in the Overseas Aid Gift Deduction Scheme (OAGDS). This AusAID administered scheme gives eligible organisations the ability to offer tax deductions to organisations who donate funds to be used for projects in eligible countries.
4. Any other pertinent issues that need to be addressed in order to operate as a charitable institution under State and Federal Laws of Australia, and any administrative legal tasks that require attention as a result.

Their recommendation has been that the Global Snakebite Initiative should be incorporated under Australian Law as a public company limited by guarantee. They consider the particular advantages of this model to be:

- a). Well established and transparent principles of corporate governance;
- b). Clearly defined responsibilities for directors;
- c). Full access to financial records for members;
- d). Legislative requirements to appoint an independent auditor and to file audited accounts with the corporate watchdog, the Australian Securities & Investment Commission (ASIC).

A copy of their letter, and a detailed summary of the features of this form of incorporation structure are available on request. Please email me at david.williams@unimelb.edu.au

Although the GSI will be incorporating initially in Australia, the organisation will be international with regard to its purpose, aims and objectives. One of the benefits of engaging Norton Rose as our legal representatives is that through them we will in the future have the ability to establish GSI branches in a range of jurisdictions, such as the USA, Europe, UK, India, Africa, Latin America, South Asia and so on. Having this option available is important to achieving our aims in the long term, but at present, we do not have the capacity to do so. We do however believe that the legislative framework for the administration of charitable institutions is very strong in Australia, with significant transparency and robust safeguards as a result of scrutiny from ASIC, the ATO and AusAID. Under the proposed structure the activities of the GSI will be subject to strict reporting and accounting standards, including annual audits by independent auditors. As a fledgling organisation we believe these attributes of the governing environment are crucial to establishing strong managerial and financial credibility.

The next steps in this process of incorporation will be to agree upon a Constitution based on a draft which Norton Rose are in the process of preparing. This document will be forwarded to us once Norton Rose receive preapproval advice from the ATO regarding our interest in ITEC and DGR registration. This will give us the opportunity to frame the Constitution with consideration to any special requirements that that ATO may bring to our attention. This will help us to avoid any difficulty later with the actual processing of these approvals and the subsequent request for OAGDS approval to the Minister for Foreign Affairs.

Through the process of incorporation, the Global Snakebite Initiative will become a legally recognised organisation in its own right. Public companies limited by guarantee do not issue shares, and hence do not have shareholders. The company will instead have members who under the Constitution will have a range of rights and responsibilities according to the type of membership. Members have a liability to the company that is limited to the value of a nominal guarantee (this could be as little as one dollar). Members may also contribute a subscription or fee for membership (see below) as a means of providing capital to enable the company to meet expenses and undertake specific projects. Under the structure proposed by Norton Rose, the Constitution of the GSI will set out the basis for membership of the organisation. Ideally we want the widest possible membership base, spanning scientific, medical, business, government, political and special interest groups. We believe that this is fundamental since snake bite is not just a medical problem, but a much more complex social, political and humanitarian issue. There has been some informal discussion regarding membership categories, and we propose to consider a membership schedule that recognises:

1. Organisations and associations, such as the IST or other professional bodies;
2. Commercial organisations and industry partners;
3. Institutions, such as Universities or Colleges;
4. Individuals;
5. Regional Working Groups, such as a collective of individuals from Africa, Australia or Asia who cooperate as a sub-committee of the GSI to focus on a particular area;
6. Specialist Groups, such as a collective of individuals from the Emergency Medicine community.

Our aim once the organisation is established will be to seek to appoint professional volunteer directors to help manage its affairs, and to succeed in attracting funding from a variety of sources. To this end, we are currently looking at a number of high profile public companies in Australia, who, under their own corporate giving frameworks, encourage their executives to donate time to managing charitable organisations such as the GSI will become, and our ultimate aim would be to see the GSI operated by a Board comprised of a majority of professional company directors from wide business backgrounds, supported by a small administration staff, and a number of scientific, medical and technical advisory committees made up of relevant experts from among our own ranks. Members of the GSI may also nominate for positions on the Board at a General Meeting. Where a member is an organisation, such as the International Society on Toxinology (IST) for example, we would anticipate that the Head of the organisation would be able to nominate a representative to stand for election on the Board. Professional management is a key feature of all successful enterprises of this type, and we think that it is crucial that the need to attract this sort of expert leadership be recognised from the outset. Regardless of who sits on the Board now or in the future, these directors will be answerable to the membership of the GSI organisation, and will also be accountable under Australian Corporations Law, and a range of other Statutes.

During the period from initial incorporation and until such time as an inaugural General Meeting can be convened this year, it will be necessary for the three directors positions and that of company secretary to be filled on a transitional basis. The following people have consented to act as public officers in a transitional capacity:

1. Dr Nick Brown
2. Dr Simon Jensen
3. Professor David Warrell
4. Mr David Williams

A further update on the process of incorporation and registration as Income Tax Exempt Charity (ITEC) and a Deductible Gift Recipient (DGR) will be made in a future edition of the IST newsletter.

Regional Working Groups

We have also considered the value of establishing Regional Working Groups to work in collaboration with the GSI management, but with considerable autonomy to develop regional projects, undertake regional advocacy and act as regional representatives of GSI. We hope that these Groups can be at the forefront of actual service delivery by GSI. We would welcome expressions of interest in forming such groups from members in Africa, SE Asia and Latin America in particular.

To this end, a group of our colleagues from South Asia have met recently in India, and have established a South Asian GSI Working Group, which will specifically look at a range of snakebite issues relevant to India, Sri Lanka, Nepal, Bangladesh, Pakistan and neighbouring countries. The group will be affiliated to both the Global Snakebite Initiative and to the newly formed the National Society on Toxinology of India. Professor R. Manjunatha Kini has taken on the role of acting moderator of this group, who aims are to address issues such as:

1. Snakebite prevention through community education
2. The need to improve snakebite epidemiology through better reporting and surveillance
3. The improvement of snakebite management, including first aid issues, diagnostics and treatment protocol
4. Development of highly potent antivenoms and improvements in safety and specificity
5. Snakebite-related disability and the need for rehabilitation

This is an exciting and very positive step forward. That this group is wholly comprised of local experts is extremely encouraging, since local 'ownership' and advocacy are critical to the success of undertakings such as this. We wish this group the very best, as they develop strategies that are relevant to their region and move to achieve a number of goals. Anyone who is interested in assisting in this project within the South Asian region, should contact Professor Kini by email for more information: dbskinim@nus.edu.sg

Development of a GSI Business Model

In order to be successful, GSI must operate under clearly defined business principles. The organisation must be able to generate income (from donations, grants, bequeaths, etc), and that income must be expertly managed and applied to realistic projects that have excellent prospects for success, such that their success will encourage further income generation. GSI must also be collaborative and work to build partnerships with other organisations who share common interests, or common goals. This is the only way in which GSI can move from being an abstract concept to a functional and sustainable vehicle that can help to produce tangible benefits for the world's snake bite victims.

Once the incorporation of the GSI is effected, the next task that we will address will be the development of a credible business model and operating plan. We propose to embark on this activity with the assistance of law firm, Norton Rose, and a pro bono accounting firm (negotiations are proceeding in this regard). The purpose will be to develop a detailed proposal for how the GSI will go about raising the funds to enable it to carry out projects in various parts of the world. We have over the last 12 months assembled a number of ideas for specific GSI projects, including:

- a). The development, publication and distribution of standard protocols for conducting both hospital-based and community oriented epidemiological assessments of the burden of snake bite;
- b). The development, publication and distribution of evidence-based position statements on appropriate, safe, snake bite first aid for various regions of the world;
- c). The development, publication and distribution of regional pocket-sized Guideline booklets on the management of snake bite, along with wall charts, posters and other clinical practice materials for web-based distribution;
- d). The development of a new Pan-Asian Polyvalent Antivenom in collaboration with a number of antivenom producers who would pool surplus production capacity to produce the product according

to a strict manufacturing and QC protocol using carefully validated venom mixtures produced from snakes from the target nations, and standardised in a central laboratory.

As part of the business planning process, various projects will be assessed and costed before a decision is reached on whether they can be recommended or not. This process will involve considerable consultation, and with regard to some of these concepts, we have already started that process with some of you. Ideally what we would propose is to involve as many people as possible in this process of developing project proposals. Once the process begins in earnest, we will need to have considerable input from all of you in order to develop the most rational and practical pathway to achieving some of these projects.

As we start to get the GSI up and running over the coming months, we will be in much more regular contact, and we will be calling on as many of you as possible to assist us in developing components of a business model and operational plan for GSI. Once the GSI is established as a legal entity, we will need people to involve themselves in committees to provide advice and support. So far, GSI has had a slow start, we hope to change that over the next 6 months or so. We also hope that through the structure of the GSI we will be able to maximise the participation of people living and working in the developing world, especially some of you, and your colleagues.

David Williams

GSI Coordinator

South Asian Snakebite Initiative (SASI)

Report from Prof. Kini

Formation of a working group:

Using the venue of the AMPTOX-2010 conference, a group of venom researchers, clinicians and herpetologists convened to form a Working Group on snakebite in South Asia, affiliated to the Global Snakebite Initiative of the WHO and endorsed by the International Society of Toxinology and the newly formed the National Society on Toxinology of India.

List of Members present:

R. M. Kini
Romulus Whitaker
T. V. Gowda
Joseph K. Joseph
Robin Doley
D. Velmurugan
A. Gomes
D. P. Punde
B. S. Vishwanath
Samir Whitaker
Jaideep Menon
Ashish Mukherjee
V. V. Pillay
Gerry Martin

Purpose and Objectives:

The SASI Working Group has, with inputs from international colleagues, identified what it considers the key subjects and actions that need to be taken in order to mitigate the problem of unacceptably

high snakebite mortality and morbidity in the region. Some of the specific goals are:

Snakebite prevention: Community education

Snakebite epidemiology: Reporting and surveillance

Snakebite treatment protocols: First aid training; diagnostics; treatment protocols

Development of a highly potent antivenoms: Geographic variations; improvement of quality of antivenoms

Disability and rehabilitation support

In order to move forward efficiently and effectively, a Working group is set-up.

Suggestions for Further Discussions and Actions

Education- Use of existing systems in schools and colleges, FM Radio, Documentary Films with UGC, Antivenom producers and other sources of support.

Action on Antivenom- Titters and cleanliness improvement, awareness decimation, distribution mechanisms.

Inclusion of Central and State Health and Forestry (Wildlife) authorities in ongoing action plans.

Information needed on current production, distribution and usage of antivenom.

Identify sources of venom other than the Irula Co-operative.

Identify clinicians around the region who will collaborate on snakebite data collection.

An important paper on snakebite death epidemiology has just been published, dramatically revising the statistics for India. Members interested in this area of toxinology are urged to read this paper.

OPEN ACCESS Freely available online



Snakebite Mortality in India: A Nationally Representative Mortality Survey

Bijayeeni Mohapatra¹, David A. Warrell^{2,3}, Wilson Suraweera⁴, Prakash Bhatia⁵, Neeraj Dhingra⁶, Raju M. Jotkar^{4,7}, Peter S. Rodriguez⁴, Kaushik Mishra¹, Romulus Whitaker⁸, Prabhat Jha^{4*}, for the Million Death Study Collaborators[¶]

1 Shri Ramachandra Bhanj Medical College, Cuttack, Orissa, India, **2** Nuffield Department of Clinical Medicine, University of Oxford, Oxford, United Kingdom, **3** Australian Venom Research Unit, University of Melbourne, Melbourne, Australia, **4** Centre for Global Health Research (CGHR), Li Ka Shing Knowledge Institute, St. Michael's Hospital and Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada, **5** Indian Institute of Health and Family Welfare, Hyderabad, India, **6** National AIDS Control Organization, New Delhi, India, **7** St. John's Research Institute, Bangalore, India, **8** Madras Crocodile Bank Trust and Centre for Herpetology, Chennai, India

Abstract

Background: India has long been thought to have more snakebites than any other country. However, inadequate hospital-based reporting has resulted in estimates of total annual snakebite mortality ranging widely from about 1,300 to 50,000. We calculated direct estimates of snakebite mortality from a national mortality survey.

Methods and Findings: We conducted a nationally representative study of 123,000 deaths from 6,671 randomly selected areas in 2001–03. Full-time, non-medical field workers interviewed living respondents about all deaths. The underlying causes were independently coded by two of 130 trained physicians. Discrepancies were resolved by anonymous reconciliation or, failing that, by adjudication. A total of 562 deaths (0.47% of total deaths) were assigned to snakebites. Snakebite deaths occurred mostly in rural areas (97%), were more common in males (59%) than females (41%), and peaked at ages 15–29 years (25%) and during the monsoon months of June to September. This proportion represents about 45,900 annual snakebite deaths nationally (99% CI 40,900 to 50,900) or an annual age-standardised rate of 4.1/100,000 (99% CI 3.6–4.5), with higher rates in rural areas (5.4/100,000; 99% CI 4.8–6.0), and with the highest state rate in Andhra Pradesh (6.2). Annual snakebite deaths were greatest in the states of Uttar Pradesh (8,700), Andhra Pradesh (5,200), and Bihar (4,500).

Conclusions: Snakebite remains an underestimated cause of accidental death in modern India. Because a large proportion of global totals of snakebites arise from India, global snakebite totals might also be underestimated. Community education, appropriate training of medical staff and better distribution of antivenom, especially to the 13 states with the highest prevalence, could reduce snakebite deaths in India.

Citation: Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, et al. (2011) Snakebite Mortality in India: A Nationally Representative Mortality Survey. *PLoS Negl Trop Dis* 5(4): e10118. doi:10.1371/journal.pntd.0001018

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Competing Interests: The authors have declared that no competing interests exist.

* E-mail: prabhat.jha@utoronto.ca

¶ Membership of the Million Death Study Collaborators is provided in the Acknowledgments.



**9th IST ASIA PACIFIC MEETING
ON ANIMAL, PLANT
AND MICROBIAL TOXINS
September 4–8, 2011 Vladivostok, Russia**

9th IST Asia Pacific Meeting on Animal, Plant and Microbial Toxins
Institute of Bioorganic Chemistry, Russian Academy of Sciences
16/10 Miklukho-Maklaya Street, 117997 GSP Moscow, Russia
Phone: (+7-495) 330-7310
E-mail: AP-IST@ibch.ru, ap.ist.2011@gmail.com Web: www.ap-ist.org

Welcome to Vladivostok!

On behalf of the International Society on Toxinology (IST) we are pleased to announce the 9th IST Asia Pacific Meeting on Animal, Plant and Microbial Toxins in Vladivostok, Russia on September 4–8, 2011.

The Congress Program will focus on the following main topics:

Toxin Structure and Mode of Action
Proteomics and Genomics
Bioactive Substance from the Sea (Marine Toxins)
Drug Development
Clinical Toxinology
Toxins Miscellaneous

Some prominent scientists in the field of toxinology have already confirmed their willingness to join us in Vladivostok as invited speakers and to contribute to the Congress Program:

Geoffry Isbister	School of Medicine and Public Health, The University of Newcastle, Australia
R Manjunatha Kini	Protein Science Laboratory, Department of Biological Sciences, National University of Singapore
Songping Liang	College of Life Sciences, Hunan Normal University, Changsha, Hunan, China
Hideyuki Nakagawa	University of Tokushima, Department of Life Sciences, Tokushima-City, Japan
David J. Newman	Natural Products Branch, National Cancer Institute, Frederick, USA
Baldomero M. Olivera	Department of Biology, University of Utah, Salt Lake City, USA

For full information on the 9th IST Asia Pacific Meeting on Animal, Plant and Microbial Toxins please visit our Web site www.ap-ist.org.

The Meeting will be hosted by Vladivostok, the largest city of the Russian Far East and, of course, one of the most interesting and remarkable cities of Russia. Lying on the border between the mountains and the taiga, this area was home for Amur tigers for centuries. Even now you might encounter tigers in the woods near Vladivostok.

Nowadays, Vladivostok is among the ten most prospective cities of the world, as determined by the special UNESCO Commission. What could be even of more interest for the potential attendees of our Congress, Vladivostok has become a centre of marine biotechnology and biological research in Russia.

Welcome to Vladivostok – a city where the morning of Russia begins! If you happen to see this city once, you will remember it forever.

Important Dates

November 15, 2010	Abstract Submission opens
November 15, 2010	Early Registration opens
May 25, 2011	Deadline for Early Registration
June 25, 2011	Deadline for Abstract submission
August 1, 2011	Pre-registration Deadline
September 3, 2011	Onsite Registration opens

Eugene GRISHIN

Russian Academy of Sciences, Moscow

Valentin STONIK

Far-Eastern Branch of the Russian Academy of Sciences, Vladivostok

CONGRESS SECRETARIAT

9th IST Asia Pacific Meeting on Animal, Plant and Microbial Toxins

Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry

16/10 Miklukho-Maklaya Street, 117997 Moscow, Russia

E-mail: AP-IST@ibch.ru, ap.ist.2011@gmail.com

Web site: www.ap-ist.org



**17th Congress of
the European Section
of the INTERNATIONAL SOCIETY
on **TOXINOLOGY****

**September 11 - 15, 2011
Valencia, Spain**

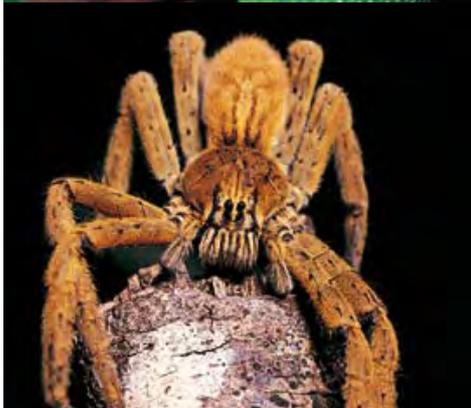
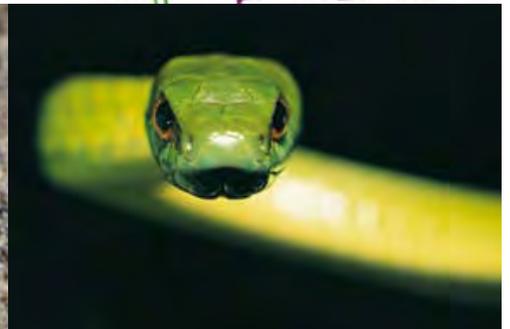
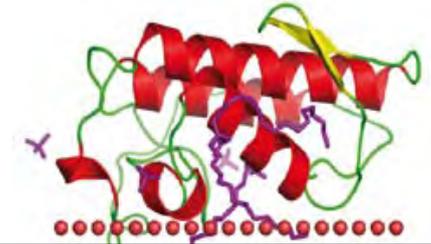




About the congress

The topic of the congress is: "**Animal, plant and microbial toxins. From basic to translational venomics**". Besides discussing the latest developments in this discipline, the major objective of the meeting is to facilitate contacts between groups of basic and clinical research, molecular biology and proteomics technologies, which may help creating synergies to develop new strategies to alleviate the serious problems caused by envenoming by animal, plant and microbe toxins. Issues to be discussed at the meeting's oral and poster sessions include:

- Evolutionary aspects of venoms. Understanding biology and pathology
- Systems biology approach to study venoms and the envenomation process
- Management of envenomation:
 - Problematic associated with hosting exotic venomous animals in non-natural environment (zoos, private collections, etc.)
 - Improving antidotes through combination of technologies
 - Translational venomics
- Structural biology approach to establish structure-function correlations of toxins
- Toxins as tools
- The CONCO project
- Arthropod and hymenopteran venoms
- Bacterial and marine toxins
- Taxonomy



Preliminary program

Opening lecture

David A. Warrell. University of Oxford, John Radcliffe Hospital, Oxford, United Kingdom.
Interdisciplinary approaches to the understanding, prevention and treatment of clinical envenoming

Session 1: Evolutionary aspects of venomous animals and their venoms (Chair, H. Lisle Gibbs)

H. Lisle Gibbs. Department of Evolution, Ecology and Organismal Biology, Ohio State University, Columbus, OH, USA.
Deconstructing a complex molecular phenotype

Axel Barlow¹ & Nick Casewell². ¹Bangor University, North Wales, United Kingdom; ²Liverpool School of Tropical Medicine, Liverpool, United Kingdom.
*Dietary shifts drive adaptive venom evolution in the genus *Echis**

Mahmood Sasa. Instituto Clodomiro Picado, Universidad de San José, San José, Costa Rica.
Natural history and toxin evolution: lessons from the "ultimate" snake

Nicolas Vidal. Département Systématique et Evolution, UMR 7138, Muséum National d'Histoire Naturelle, Paris, France.
The evolution of venomous reptiles

Session 2: Toxins as tools (Chair, Glenn F. King)

Glenn F. King. Institute of Molecular Science, The University of Queensland, Queensland, Australia.
Analgesic peptides from spider venoms

Ian Mellor. School of Biology, University of Nottingham, Nottingham, United Kingdom.
Polyamine-containing toxins as tools for dissecting elements of excitatory neurotransmission

Jan Tytgat. Laboratory of Toxicology and Food Chemistry, Catholic University of Leuven, Leuven, Belgium.
Nav channels and toxins in relation to human pathologies



Session 3: Snakebite envenoming: clinical and therapeutic aspects (co-Chairs, David A. Warrell and José M. Gutiérrez)

David A. Warrell. University of Oxford, Oxford, United Kingdom.
Snakebite envenoming: clinical and therapeutic aspects

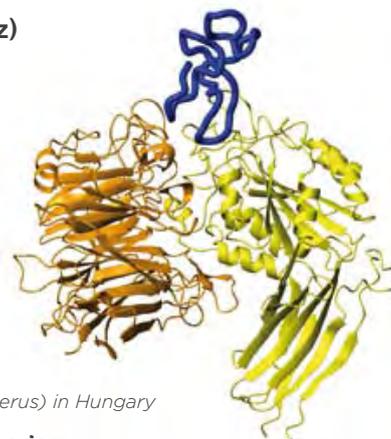
José M^a Gutiérrez. Instituto Clodomiro Picado, Universidad de Costa Rica. San José, Costa Rica.
Towards a better design and preclinical assessment of antivenoms

Luc de Haro. Marseille Poison Centre, Marseille, France.
Management of snake bites in France: experience of the Marseille Poison Centre

Andrea Giampreti. Poison Control Centre and National Toxicology Information Centre, Toxicology Unit, IRCCS Maugeri, Foundation and University of Pavia, Pavia, Italy.
Evolution of clinical features and management of viper-bitten patients in Italy

Robert A. Harrison. Liverpool School of Tropical Medicine, Liverpool, United Kingdom.
Molecular and bioinformatic tools for improving antivenom: feasible or fiction?

Tamás Malina. Medical Department, Lilly Hungary Ltd. Budapest, Hungary.
*Clinical picture of the envenomings by different populations of the Common adder (*Vipera berus*) in Hungary*



Session 4: Structure, function and evolution of venom PLA2 molecules- In memoriam of Prof. F. Gubensek (Chair, Igor Križaj)

Igor Križaj. Departments of Biochemistry and Molecular Biology, Jožef Stefan Institute, Ljubljana, Slovenia.
Our current understanding of the mechanism of nerve terminal poisoning by snake venom phospholipases A2

Cesare Montecucco. Dipartimento di Scienze Biomediche, Università di Padova, Padova, Italy.
Snake PLA2 myotoxins call for DANGER

Bruno Lomonte. Instituto Clodomiro Picado, Universidad de Costa Rica. San José, Costa Rica.
Lys49 myotoxins from snake venoms

Ponnampalam Gopalakrishnakone. International Society on Toxinology President and National University of Singapore, Singapore.
sPLA2 inhibitors as drug targets

Session 5: Venomics (Chair, Juan J. Calvete)

Simon Wagstaff. Liverpool School of Tropical Medicine, Liverpool, United Kingdom.
Snake venom gland transcriptomics

Michael K. Richardson. Institute of Biology, Dept. Integrative Zoology, University of Leiden, Leiden, Netherlands.
Sequencing and Data-mining of the King Cobra Genome

Juan J. Calvete. Instituto de Biomedicina de Valencia, CSIC, Valencia, Spain.
Towards Systems Venomics

Florence Jungo. Swiss Institute of Bioinformatics, Swiss-Prot group, Geneva, Switzerland.
Animal toxins in UniProtKB/Swiss-Prot

Session 6: Bacterial and marine toxins (Chair, Cesare Montecucco)

Klaus Aktories. Institute of Experimental and Clinical Pharmacology and Toxicology, Albert-Ludwigs-University Freiburg, Freiburg, Germany.
Crashing scaffolds: Bacterial proteins toxins acting on the cytoskeleton of target cells

Ornella Rossetto. Dipartimento di Scienze Biomediche, Università di Padova, Padova, Italy.
The mechanism of action of botulinum neurotoxins

Peter Maček. Biotechnical Faculty, University of Ljubljana, Ljubljana, Slovenia.
Pore-forming toxins targeting membrane nanodomains

Session 7: CONCO Project (Chair, Dietrich Mebs)

Tim Stockwell. J. Craig Venter Institute, Rockville, MD, USA.
*The genome of *Conus consors**

Philippe Favreau. Atheris Laboratories, Bernex-Geneva, Switzerland.
*The proteome of *Conus consors**

Oliver Hartley. Faculty of Medicine, University of Geneva, Geneva, Switzerland.
A synthetic library of cone snail peptides

George Miljanich. Airmid Inc, Redwood City, CA, USA.
*Drug discovery aspects of *Conus* peptides*

Closing lecture

Dirk C. de Graaf. Laboratory of Zoophysiology, Ghent University, Ghent, Belgium.
*Diversity in Hymenoptera venom composition and its biological function, focusing on the honey bee (*Apis mellifera*) and the parasitoid wasp *Nasonia vitripennis**





Scientific committee

Juan J. Calvete. Instituto de Biomedicina de Valencia, CSIC. Valencia, Spain.

Jean-Phillipe Chippaux. Unité de recherche Santé de la mère et de l'enfant en milieu tropical, Université Paris Descartes. Paris, France.

Pierre Escoubas. Institut de Pharmacologie Moléculaire et Cellulaire, CNRS. Valbonne, France.

Jay W. Fox. University of Virginia School of Medicine. Charlottesville, VA, USA.

Bryan G. Fry. Venom Evolution Laboratory, School of Biological Sciences, The University of Queensland. Queensland, Australia.

H. Lisle Gibbs. Department of Evolution, Ecology and Organismal Biology, Ohio State University. Columbus, OH, USA.

José María Gutiérrez. Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica. San José, Costa Rica.

Robert A. Harrison. Liverpool School of Tropical Medicine. Liverpool, United Kingdom.

Alan L. Harvey. Strathclyde Institute of Pharmacy & Biomedical Sciences, University of Strathclyde. Glasgow, United Kingdom.

R. Manjunatha Kini. Department of Biological Sciences, National University of Singapore. Singapore.

Bruno Lomonte. Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica. San José, Costa Rica.

Steven P. Mackessy. School of Biological Sciences, University of Northern Colorado. Greeley, CO, USA.

Dietrich Mebs. Zentrum der Rechtsmedizin, University of Frankfurt. Frankfurt, Germany.

Cesare Montecucco. Dipartimento di Scienze Biomediche, Università di Padova. Padova, Italy.

Lourival D. Possani. Departamento de Medicina Molecular y Bioprocesos, Instituto de Biotecnología, Universidad Nacional Autónoma de México. Morelos, Mexico.

Jean-Marc Sabatier. ERT 62 "Ingénierie des protéines" Université de la Méditerranée - Ambrilia Biopharma Inc. Marseille, France.

Reto Stöcklin. Atheris Laboratories. Geneva, Switzerland.

Jan Tytgat. Laboratory of Toxicology and Food Chemistry, Catholic University of Leuven. Leuven, Belgium.

Simon Wagstaff. Liverpool School of Tropical Medicine. Liverpool, United Kingdom.

David A. Warrell. University of Oxford. Oxford, United Kingdom.

Julian White. Women's & Children's Hospital. North Adelaide, Australia.

Wolfgang Wüster. School of Biological Sciences, University of Wales. Bangor, United Kingdom.

Local organizing committee

Juan J. Calvete. Instituto de Biomedicina de Valencia, CSIC. Valencia, Spain. (jcalvete@ibv.csic.es)

Libia Sanz. Instituto de Biomedicina de Valencia, CSIC. Valencia, Spain.

Paula Juárez. Instituto de Biomedicina de Valencia, CSIC. Valencia, Spain.

Vicente Felipo. Centro de Investigación Príncipe Felipe. Valencia, Spain.

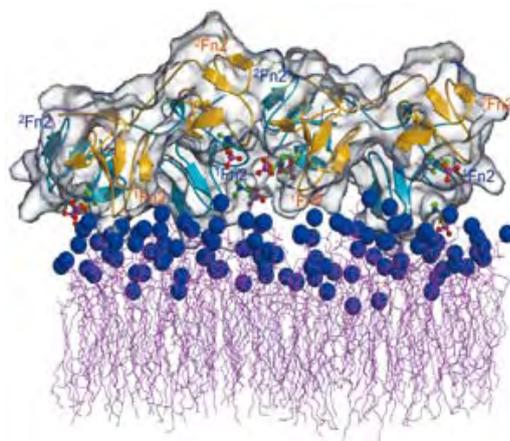
Enrique Pérez-Payá. Instituto de Biomedicina de Valencia, CSIC & Centro de Investigación Príncipe Felipe. Valencia, Spain.

Marc Martí-Renom. Centro de Investigación Príncipe Felipe. Valencia, Spain.

Ana Conesa. Centro de Investigación Príncipe Felipe. Valencia, Spain.

Andrés Moya. Universitat de València. Valencia, Spain.

Ismael Mingarro. Universitat de València. Valencia, Spain.



Congress secretariat

Cátedra Santiago Grisolia
Fundación Ciudad de las Artes y las Ciencias
- Comunitat Valenciana
Paseo de la Alameda, 42-B, 1.º - 1.ª
46023 Valencia, Spain.
Telephone: 0034 96 197 4670
Fax: 0034 96 197 4598
E-mail: catedrasg@cac.es
Web: www.fundacioncac.es/catedrasg

Travel and accommodation

To make your travel arrangements you can put in contact with our travel agency Viajes El Corte Inglés. The agency has booked rooms in several hotels within walking distance of the venue. Information can be obtained from:

Ms. Natalia Utrera
Tel.: 0034 96 310 71 89
Fax: 0034 96 341 1046
E-mail: congresos.valencia@viajeseci.es

Language

The official language of the Congress will be English.





Registration on line

<http://istmeetingvlc2011.ibv.csic.es/>

In compliance with Act 34/2002, dated 11th July, on services for the Information Society and Electronic Trade and the Organic Act 15/1999, dated 13th December on Protection of Personal Data, we hereby inform you that your data will be included and processed in the I.T. file of the Fundación Ciudad de las Artes y las Ciencias with the purpose of being able to send information to you regarding our services, news and activities. At any time the user can exercise the rights of access, correction, cancellation and opposition to the use of personal data by sending an e-mail to catedrasg@cac.es or a fax to: 0034 96 197 45 98.

Registration fees*

The congress venue allows us to accommodate 450 participants, who will be selected based on the order of registration and payment of the congress fee.

	IST Member**		Non-IST Member	
	Delegates	Graduate students	Delegates	Graduate students
Up to June 1 st , 2011	€ 250	€ 100	€ 350	€ 150
After June 1 st , 2011	€ 300	€ 125	€ 400	€ 175

A certificate of attendance will be given to all participants.

*Registration fee includes assistance to all scientific sessions and corporate exhibition, the material of the congress, lunches and coffee breaks.

**Please, indicate your society's membership ID number when you send the copy of your bank transfer.

Cancellation policy

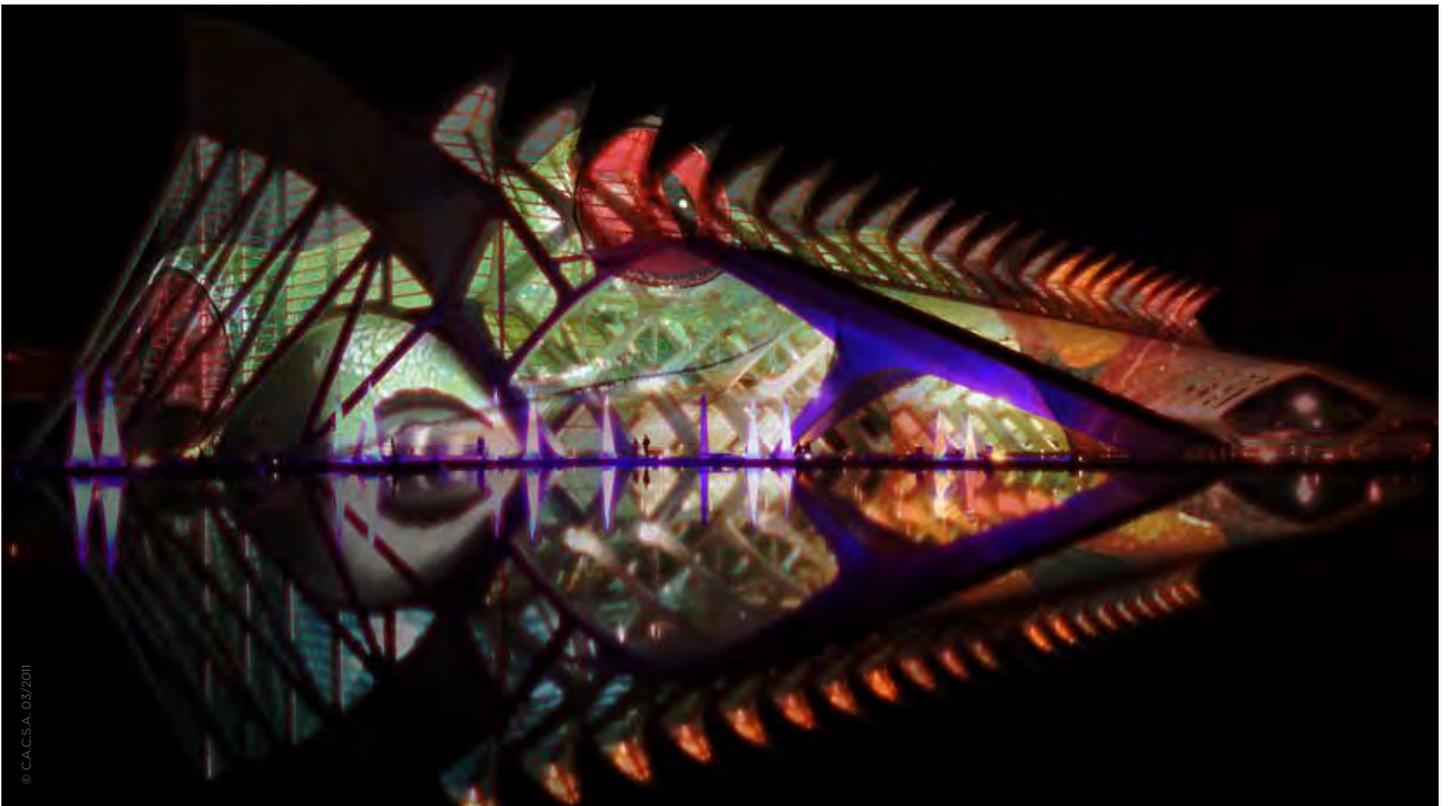
Requested for refunds must be made in writing (letter or e-mail) to the congress secretariat. There will be a € 60 processing fee applied to refunds requested by July 1st, 2011. **No refunds can be made after this date.**

Payment

Payment of registration fees should be made in Euro by bank transfer:

Account name:	Fundación Ciudad de las Artes y las Ciencias
Bank:	BANCAJA. Av. Cataluña 6. 46021 Valencia, Spain.
VAT No:	ESG-97026983
Swift code for international bank transfers:	IBAN: ES48 2077 0737 74 3100345279 BIC: CVALESVVXXX
Account number for Spanish bank transfers:	2077 0737 74 3100345279

Once the bank transfer has been made, a copy of it must be sent by e-mail (catedrasg@cac.es)
••fax (0034 96 197 45 98) indicating the name of the participant before the congress starts.





Venue

The 17th Congress of the European Section of the International Society on Toxinology will be held in the Santiago Grisolia Auditorium at the Science Museum Príncipe Felipe of Valencia (Spain). The museum, designed by Valencian architect Santiago Calatrava, and with an auditorium of 2.800 square metres, provides the perfect venue for this congress.

Valencia has a cultural heritage of over two thousand years in history, and has turned into a very modern city which is easily accessible by road, rail, sea and air. Its culture, cuisine and academic tradition along with its location on the Mediterranean coast and its pleasant climate, make it an ideal setting for this congress.

Auditorium Santiago Grisolia
Science Museum Príncipe Felipe
City of Arts and Sciences
Av. Autopista del Saler, 7
46013 Valencia, Spain
GPS coordinates: 39° 27' 23" N, 0° 21' 10" W



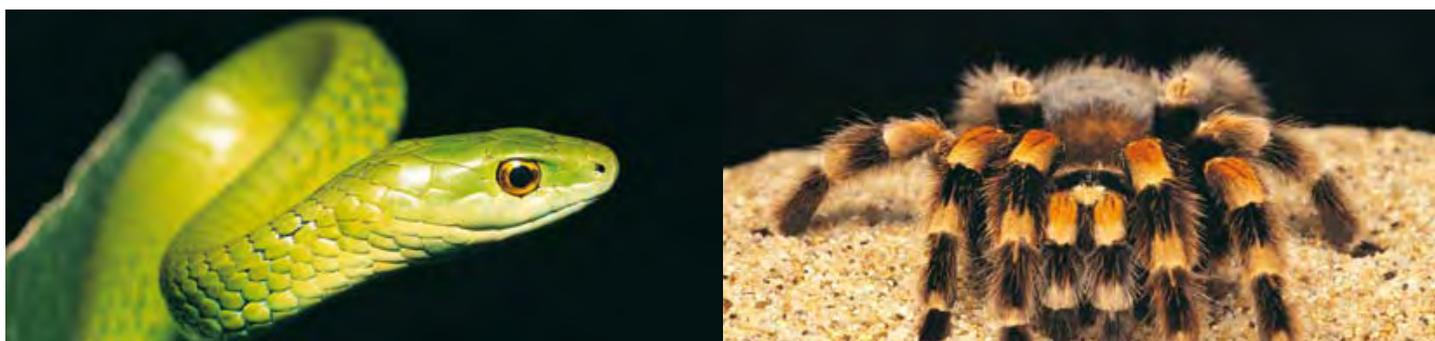
Call for abstracts

Participants are invited to submit abstracts for oral or poster presentations, the majority being presented as poster. Acceptance will be based upon the quality and relevance of the submissions.

All abstracts have to be prepared in English and must be submitted by **e-mail** to the Congress Secretariat (catedrasg@cac.es) **no later than July 15th, 2011**.

However, papers intended for **short oral presentation** must be submitted before **June 30th, 2011**.

See the **Formatting guidelines** on the website <http://istmeetingvlc2011.ibv.csic.es>.



With the organization, collaboration and sponsorship of:



With the patronage of Fundación Ciudad de las Artes y las Ciencias:



Marine and Freshwater Toxins Analysis
Second Joint Symposium and AOAC Task Force Meeting
Baiona, Spain May 1-5, 2011



With great pleasure the University of Vigo, Spain, and AOAC International's Marine and Freshwater Toxins Task Force invite you to join us for *Marine and Freshwater Toxins Analysis: 2nd Joint Symposium and AOAC Task Force Meeting*, on May 1-5, 2011

Symposium Chairs: Dra. Ana Gago-Martinez and Dr. James Hungerford

The symposium will address new developments, method validation efforts, and method implementation in the analysis of marine and freshwater toxins, as a joint meeting with the AOAC Task Force on Marine and Freshwater Toxins. A variety of methods needs, for detecting saxitoxins, domoic acids, okadaic acids, azaspiracids, other seafood toxins and the cyanobacterial toxins will be addressed in presentations and focused discussions. New methods have been recently validated, approved by regulatory stakeholders, and training has been organized. In spite of this progress many methods needs remain and so other presentations and discussions will address special needs of the community ranging from emerging toxins to the ongoing replacement of mouse bioassays with modern and fully validated chemical methods.

Principle sponsor is the University of Vigo, Spain, home to the Department of Analytical and Food Chemistry.

The conference venue is the *Talaso Atlantico*, a high quality hotel with very impressive conference facilities located near Baiona and Vigo in the Galicia region of northwestern Spain. In addition to being the largest European producer of mussels, shellfish-rich Galicia is also a very beautiful and historic area.

In addition to the keynote talks, many contributed papers, both oral and in posters will allow additional opportunities to learn of and discuss state-of-the art detection methods.

The joint Symposium and Task Force meetings (program is in preparation) will also offer unique opportunities to presenters and attendees:

- **Observe or participate in the activities of focused discussion groups in specific toxin areas.** Focused discussion groups have proven to be the most effective means of developing methodology needs and validation strategies. Symposium presenters and attendees are welcome to attend.
- **Participate in a forum with international members of the seafood industry, their associations, and also regulatory agencies.** These stakeholders, who are the ultimate users and/or benefactors of the analytical methodology, will also find that the symposium and Task Force can be used to express their needs.
- **Participate in the Marine and Freshwater Toxins Task Force.** Contribute to this new international group that fosters the development and validation of powerful and practical methods for toxin analysis, and greater availability of toxin standards.

Dates and Contacts:

- **Deadline for Abstract submission:** 1 March 2011 (Abstract guidelines forthcoming).
- **Submit Abstracts to:** biotoxins.meeting@uvigo.es
- **Notification of acceptance:** 1 April 2011
- **Deadline for Presenters Registration:** 17 April 2011
- **Registration fees:**

	Before 1 March, 2011	After 1 March, 2011
AOAC members	350 €	450 €
Non AOAC members	450 €	550 €
Students	350 €	450 €

- **Accommodations:** Please Contact to comercial@talasoatlantico.com indicating "AOAC Symposium". Rooms at the meeting site, the hotel *Talaso Atlantico*, are available at special rates of 76 Euros (single) or 98 Euros (double) before 1 March, 2011. Please make your registration as soon as possible.
- For more information please contact: biotoxins.meeting@uvigo.es



NEXT IST WORLD CONGRESS - HAWAII 2012

A local Hawaii organising executive has been formed to develop a plan for the next IST World Congress. All IST members should work together to support Dr. Carl-Wilhelm Vogel, Dr. Angel Yanagihara and Dr. Marilyn Dunlap and their colleagues in ensuring Hawaii can host a successful Congress in 2012. In an exciting development, it now appears likely that this Congress will combine with US Venom Week VI. Venom Week, organised by Dr. Steve Seifert, University of New Mexico, attracts a clinician and herpetologist audience, predominantly from the US, but with increasing attendees from other nations. Combining the IST Congress with Venom Week will hopefully produce an even more vibrant and well attended meeting, to the benefit of all. The IST Council are working with our Hawaiian colleagues and Dr. Seifert to determine the best time in 2012 to hold the Congress; July and September are months which have been considered, and dates have now been set as July 8th to 13th, 2012. We will be striving to ensure the Congress is affordable, including less expensive accommodation for student members. Several possible venues and hotels are being examined in an effort to deliver a great Congress at a good price. 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) and President (antgopal@nus.edu.sg).

4th Venoms to Drugs Conference

15-20 May 2011

Heron Island, Queensland, Australia

Dear Colleague,

We are pleased to announce the details of the fourth **Venoms to Drugs** conference to be held on Heron Island, Queensland, May 15–20, 2011. A stimulating program has been arranged including sessions on New Pharmacologies, Ion Channel Therapeutics, Structure-Activity Relationships, New Discovery Technologies, New Targets, Peptides & Peptidomimetic Drugs, and Venom Proteomics and Transcriptomics.

Heron Island, the venue for the conference, is a pristine coral cay on the Great Barrier Reef. Snorkeling, diving, tennis, reef walks, fishing and a day spa are just some of the activities that can be enjoyed on the island. The meeting is structured to ensure ample time is provided to take advantage of this stunning location.

A range of accommodation from budget to luxury is available and may be viewed on the island's website (www.heronisland.com).

You can register and book accommodation for the conference at the conference website (www.venomstodrugs.com). Program updates will be made on a regular basis and please contact Thea Monks (t.monks@uq.edu.au) for further information. We look forward to welcoming you to Heron Island in 2011.

Best Regards

Paul Alewood, Richard Lewis & Glenn King
(Organising Committee)



TOXICOLOGY MEETINGS 2010



EAPCCT

European Association of Poisons Centres and
Clinical ToxicologistsXXXI International Congress of the European Association of Poisons
Centres and Clinical Toxicologists

24-27 May 2011, Dubrovnik, Croatia, at the [Valamar Lacroma Resort Hotel](#)

1. [General Information](#)
2. [Submitting Abstracts](#)
3. [Posters](#)
4. [Registration](#)
5. [Venue and Accommodation](#)
6. [Deadlines](#)
7. [Information](#)
8. [Congress Stands](#)
9. [Local Information and Tourist Attractions](#)

1. **General Information:**
 - [Congress Flyer](#) (pdf 110 kb)
 - [Congress Announcement](#) (pdf 135 kb)
 - [Congress Brochure](#) (pdf 600 kb)
 - The final programme will be displayed here in due time.

2. **Submitting Abstracts:**
 - The **on-line abstract submission** is closed.
 - Submission deadline was November 17th 2010 (midnight).
 - For abstract submission guidelines see the [Congress Brochure](#) (p. 5-8).
 - [The Young Investigator Award](#)

3. **Posters:**
 - Size and format of poster boards will be given in due time.

4. **Registration for the Congress:**
 - On-line registration will be available here.

5. **Accommodation:**
 - Information on hotel room reservation and booking will be available here.

6. **Deadline Dates:**

Receipt of abstracts	November 17, 2010
Registration at special rates	February 18, 2011
Reserving of accommodation at special rates	March 23, 2011
Deadline for presenters to register	February 18, 2011

- 7. For information:** EAPCCT General Secretary
Mr. Peter Hultén
Swedish Poisons Information Centre
17176 STOCKHOLM
tel: +46 8 610 0596,
fax: +46 8 32 7584
- E-mail: gs@eapcct.org
- 8. Congress Stands:** Companies or organizations wishing to have a stand during the Congress may contact the EAPCCT General Secretary (see above) for information.
- 9. Local Information and Tourist Attractions:** [Tourist information \(Dubrovnik\)](#)
[Tourist information \(Croatia\)](#)
[Car rental](#)
[Buses](#)
[Taxis](#)
[Airport information](#)

2500 Calvert Street NW (at Connecticut Ave.), Washington, District of Columbia 20008
Phone: (202) 234-0700, Fax: (202) 265-7972

Welcome to the Omni Shoreham Hotel and the North American Congress of Clinical Toxicology

The Omni Shoreham Hotel welcomes attendees of Americans for the North American Congress of Clinical Toxicology. To reserve your room now and receive the special conference rate simply click on the "book now" button below.

Conference Dates: September 21 - 26, 2011
Special Rate: From \$249 per night
Book By: August 21 to receive special rate

We hope you enjoy your stay!

[Book Now](#)



LES ANIMAUX VENIMEUX ET VÉNÉNEUX



**Systematique,
biologie,
toxicologie**

Année 2010 - 2011

1981-2011: 30 ans

NEW MEETING LISTING

MODULE I - Responsables : Jean-Philippe CHIPPALUX et Michel THIREAU
Venimologie générale - Vertébrés terrestres
Lundi 24 janvier - Vendredi 28 janvier 2011

Lundi 24 janvier 2011

09h00 - 09h15 : **Accueil**

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

C. ROLLARD, Muséum

11h00 - 12h15 : **Toxicité aiguë des venins. Serums antivenimeux**

J.-P. CHIPPALUX, IRD, Cotonou

14h00 - 15h30 : **Venins : génomique, protéomique et bio-informatique**

R. STOCKLIN, Atheris, Genève

15h45 - 17h45 : **Les amphibiens venimeux**

J. LESQUIRE, Muséum

Mardi 25 janvier 2011

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

J.-P. GASC, Muséum

11h00 - 12h00 : **Visite du vivarium de la ménagerie ou des collections**

(1/2 groupe)

14h00 - 15h00 : **Visite du vivarium de la ménagerie ou des collections**

(1/2 groupe)

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

N. VIDAL, Muséum

Mercredi 26 janvier 2011

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 vénénéux**

P. BOUSSES, Muséum

Jeudi 27 janvier 2011

09h00 - 12h00 : **Épidémiologie et clinique des envenimations ophidiennes**

J.-P. CHIPPALUX, IRD, Cotonou

14h00 - 15h30 : **Immunothérapie des envenimations ophidiennes**

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

15h45 - 17h15 : **Composition générale et mode d'action des venins de serpents Elapidae**

D. SERVENT, CEA

Vendredi 28 janvier 2011

09h00 - 10h15 : **Anticorps recombinants neutralisants**

P. BILIAUD, Muséum et UFR pharmacie, Paris-Sud

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

F. DUCANCEL, CEA

14h00 - 15h15 : **Inhibiteurs naturels des PLA₂. Résistance naturelle aux venins**

G. FAURE, Institut Pasteur, Paris

15h30 - 17h00 : **Synthèse et conclusion**

J.-P. CHIPPALUX, IRD, Cotonou

MODULE II - Responsables : Christine ROLLARD et Max GOYFFON

Arthropodes terrestres - Parasites

Lundi 14 mars - Vendredi 18 mars 2011

Lundi 14 mars 2011

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**

C. VILLEMANT et J. WEULERSSE, Muséum

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

M. GOYFFON, Muséum

Mardi 15 mars 2011

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

P. BOURDEAU, Oniris, Nantes

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

P. BOURDEAU, Oniris, Nantes

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

V. CHOUVET, Institut Pasteur, Paris

Mercredi 16 mars 2011

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

J.-J. GEOFFROY, CNRS et Muséum

14h00 - 16h15 : **Les acariens : systématique, biologie et fonction venimeuse (I)**

R. CHERMETTE, ENV, Maisons-Alfort

16h30 - 17h30 : **Les acariens : systématique, biologie et fonction venimeuse (II)**

R. CHERMETTE, ENV, Maisons-Alfort

Jeudi 17 mars 2011

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 18 mars 2011

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 16 mai - Vendredi 20 mai 2011

Lundi 16 mai 2011

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

S. BAGHDIGUIAN, Montpellier

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

C. MATTEI, Angers

14h00 - 17h00 : **Les cnidaire**

M. GUILLAUME, Muséum

Mardi 17 mai 2011

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

P. FAVREAU, Atheris, Genève

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

J. MOICO, CNRS, Gif-Sur-Yvette

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

P. LASSUS, IFREMER, Nantes

16h00 - 17h00 : **Les annélides**

T. MEZIANE, Muséum

Mercredi 18 mai 2011

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**

N. AMÉZIANE et J.-L. D'HONDT, Muséum

Jeudi 19 mai 2011

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, Oniris, Nantes

Vendredi 20 mai 2011

09h00 - 09h45 : **Intoxications par consommation 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

Renseignements, inscriptions et coordination :

Service de la formation continue MUSÉUM
43, rue Buffon, 75005 Paris
Tél : 01 40 79 48 85

Max GOYFFON MNHN Département RDDM
USM 505 - LÉRAI
57, rue Cuvier, 75005 Paris
Tél : 01 40 79 31 54
mgoiffon@mnhn.fr

Jean-Philippe CHIPPALUX Centre IRD de Cotonou
08 BP 841
Cotonou - BÉNIN
jean-philippe.chippaux@ird.fr

Christine ROLLARD MNHN Département SE
USM 0602 - Section Arthropodes,
61, rue Buffon, CP 53 - 75005 Paris
Tél : 01 40 79 35 75 Fax : 01 40 79 38 63
chroll@mnhn.fr





1961 West Brichta Dr.
Tucson, AZ 85745, USA
Tel: 1 520 884-9345
Fax: 1 520 884-9345
ponerine@dakotacom.net

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 ₅₀ mg/kg, mice)	VENOM PRICE			
			1 mg	5 mg	25 mg	100 mg
SOCIAL WASPS		(LD ₅₀)				
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. mandarinia</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	*	
SOCIAL BEES						
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 ₅₀ mg/kg, mice)	VENOM PRICE			
			1 mg	5 mg	25 mg	100 mg
ANTS -- FORMICIDAE		(LD ₅₀)				
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>Tetraponera</i> sp.**	(.35)	140	600	*	
A-120	<i>Streblognathus aethiopicus</i>	(8.0)	80	360	*	
SOLITARY WASPS AND BEES						
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) 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>Mircrurus tener tener</i>	\$2000 ⁰⁰ /1g			
Florida Coral Snake - <i>Mircrurus 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
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
Western Massasauga - <i>Sistrurus catenatus tergeminus</i>	\$1000 ⁰⁰ /1g	\$675 ⁰⁰ /500mg	\$182 ²⁵ /100mg	\$123 ⁰² /50mg
Bushmaster - <i>Lachesis muta muta</i>	\$2000 ⁰⁰ /1g	\$1350 ⁰⁰ /500mg	\$364 ⁵⁰ /100mg	\$246 ⁰⁴ /50mg

(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.

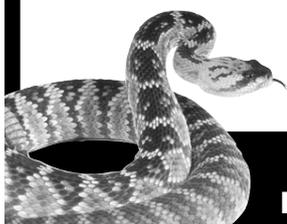
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Lyophilised Venoms Snakes

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

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Dendroaspis viridis	\$750.00
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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
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Agkistrodon c. laticinctus	\$190.00
Agkistrodon c. mokasen	\$100.00
Agkistrodon p. conanti	\$100.00

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Venom Price List 2009-2010

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Slade, KY 40376

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Fax: 606-663-6917

Web: www.kyreptilezoo.orgEmail: reptilezoo@bellsouth.net**Crotalidae**

<i>Agkistrodon contortrix contortrix</i>	\$60.00
<i>Agkistrodon contortrix mokasen</i>	\$55.00
<i>Agkistrodon contortrix laticinctus</i>	\$70.00
<i>Agkistrodon contortrix phaeogaster</i>	\$70.00
<i>Agkistrodon contortrix pictigaster</i>	\$70.00
<i>Agkistrodon piscivorus leucostoma</i>	\$45.00
<i>Agkistrodon piscivorus piscivorus</i>	\$45.00
<i>Bothrops asper</i>	\$100.00
<i>Bothrops atrox</i>	\$100.00
<i>Bothrops moojeni</i>	\$100.00
<i>Crotalus adamanteus</i>	\$60.00
<i>Crotalus atrox</i>	\$70.00
<i>Crotalus basiliscus basiliscus</i>	\$200.00
<i>Crotalus cerastes</i>	\$100.00
<i>Crotalus durissus cumanensis</i>	\$300.00
<i>Crotalus durissus durissus</i> (fmr. <i>C. d. dryinas</i>)	\$200.00
<i>Crotalus durissus terrificus</i>	\$175.00
<i>Crotalus horridus</i>	\$100.00
<i>Crotalus horridus</i> (type A neurotoxin)	\$100.00
<i>Crotalus molossus</i> (Texas origin)	\$70.00
<i>Crotalus scutulatus scutulatus</i>	\$250.00
<i>Crotalus viridis viridis</i>	\$70.00
<i>Protobothrops flavoviridis</i>	\$200.00
<i>Trimeresurus borneoensis</i>	\$200.00

Elapidae

<i>Dendroaspis angusticeps</i>	\$350.00
<i>Dendroaspis jamesoni kaimosae</i>	\$400.00
<i>Dendroaspis polylepis</i>	\$400.00
<i>Micrurus tenere</i>	\$1000.00
<i>Naja kaouthia</i>	\$100.00
<i>Naja kaouthia</i> (Suphan province)	\$100.00
<i>Naja melanoleuca</i>	\$80.00
<i>Naja naja</i> (India)	\$85.00
<i>Naja naja</i> (Pakistan)	\$80.00
<i>Naja nigricollis nigricollis</i>	\$80.00

<i>Naja nivea</i>	\$100.00
<i>Naja pallida</i>	\$100.00
<i>Naja siamensis</i>	\$60.00
<i>Ophiophagus hannah</i>	\$95.00
<i>Pseudechis colletti</i>	\$320.00

Viperidae

<i>Bitis arietans</i>	\$120.00
<i>Bitis gabonica rhinoceros</i>	\$130.00
<i>Daboia (Vipera) russelli</i>	\$200.00
<i>Daboia (Vipera) siamensis</i>	\$200.00
<i>Echis carinatus</i>	\$350.00
<i>Echis pyramidium</i>	\$350.00

Helodermatidae

<i>Heloderma horridum</i>	\$600.00
<i>Heloderma suspectum</i>	\$600.00

Terms

- All venoms are collected in a sterile manner and frozen at -70C before lyophilization.
- Other venoms are available upon request in small quantities; please contact us for more information on other venoms
- CITES papers available on all CITES listed species. Extra costs apply for permits and inspection fees.
- Locale information available for most species.
- Payment may be made by check, money order, wire transfer, PayPal, MC, Visa, and Discover. All prices are listed per gram in US dollars. Shipping and packing charges are extra.
- Discounts on standing orders and orders of 10g or more.
- KRZ makes every effort to stay current regarding nomenclature and taxonomy. Our listing reflects current trends, with former names in parentheses. If you have questions, please feel free to contact us.
- Scale clippings for DNA analysis available at an extra charge. Please contact us for more information.

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