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Editorial

Editorial: Scorpion venom and antivenom

This special issue on scorpion venom and antivenom illustrates the very broad range of work currently arising from this fascinating subset of toxinology. These papers examine essential ion channel effects, the interaction of peptide toxins with cardiovascular physiology, the potential utility of toxins in cancer diagnosis and therapy, the importance of the specific immunoglobulin derivative on pharmacokinetics of treatment, the preclinical development of recombinant antibody fragments for therapeutic use, the clinical effects of antivenom in treatment of venom toxicity, and the pharmacoeconomics of antivenom.

In many ways, this cross section of current inquiry is representative of that which today underlies most basic and clinical toxinology research. Although fundamental elements were well accepted over a century ago – venom, injected into biological systems, disrupts normal function; and antiserum, collected from immunized vertebrates, interferes with this process – little was known about how this happened, and why it sometimes did not. Over time, specific venom toxins have been better and more completely characterized, their structures and physiology and evolutionary biology better understood. Simultaneously, the technology enabling purification, alteration, and measurement of proteins has advanced, and with it our abilities to examine the specific interaction of a molecule with a receptor, *in vitro*; and the medical consequences, *in vivo*. Today's basic research, more often than not, examines the effect of a specific toxin on a particular physiological indicator; and today's translational and clinical research

attempts to quantitate and characterize the consequences of therapy in ways not previously possible.

As the reader will discover, however, there remains plenty of work for tomorrow's clinicians and scientists. How can our knowledge of receptor interactions be translated into better outcomes for patients with cancer or neurologic disease? How can we use what we have learned about antibody derivatives and recombinant technology to balance the requirements for efficacy, safety and cost effectiveness of treatment of envenomated children? What does our understanding of individual venom components enable us to ask about more complex interactions of toxins and defenses, within and across species of scorpion, predator and prey?

We hope that this issue will be a thought-provoking source of information for students, scientists, and physicians; and also for those involved in development of pharmaceuticals from venom toxins and from hyperimmune plasmas.

Leslie Boyer*

Venom Immunochemistry, Pharmacology and Emergency Response Institute, University of Arizona, 1501 N. Campbell Avenue, Tucson, AZ 85724, USA

* Tel.: +1 520 626 6229.

E-mail address: boyer@viper.arizona.edu

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