Biological Toxins and Medicinal Chemistry: Research and Therapeutic Tools

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Aims & Scope:

Toxins are widely distributed among venomous organisms, from bacteria to mammals, as strategies for defense or prey capture. Throughout evolution, "toxicity" is considered as a successful adaptive character, no matter if toxins are produced in sophisticated organs or not. It is worth noting that toxins constitute potent pharmacological compounds acting on ion channels, membrane receptors and enzymes, thus affecting cellular excitability and many other physiological processes.

Toxins usually exhibit high affinity and specificity for their targets, constituting valuable research tools for the study of several signaling pathways. Furthermore, some toxins have led to the development of very effective therapeutic agents for the treatment of chronic diseases, which makes of toxinology an attractive field for the bioindustry. However, in spite of the great diversity of venomous organisms and the biological activities of their extracts, a relatively small number of toxins have been described, which makes of natural products a great and promising reservoir of novel drugs.

The main goal of this special issue is to discuss the state-of-the-art of toxins in basic and applied research, addressing toxin diversity and molecular characterization, novel biological activities and toxins as research tools for exploring physiopathological pathways. We aimed to determine the current status of toxin-derived drugs in therapeutics as well as the potential of other toxin-related candidates. We also look forward to receive critical reviews on cutting-edge approaches in toxinology, encouraging the contributions about novel proteomic/genomic/transcriptomic methodologies, structure-function analysis and bioinformatic strategies with predictive value, but also of high-throughput assays like the automated patch-clamp recordings.

Keywords:

Drug discovery, medicinal chemistry, pharmacology, toxins, venomous organisms

Subtopics:

1. Development of therapeutical candidates based on biological toxins.
2. Toxins as pharmacological tools for the study of signaling pathways and cellular excitability.
4. In silico models of toxin-receptor interactions.
6. High-throughput screenings for toxin activities.

Schedule:

- Manuscript submission deadline: July 31, 2014
- Peer Review Due: October 15, 2014
- Revision Due: November 15, 2014
- Notification of acceptance by the Guest Editor: December 20, 2014
- Final manuscripts due: January 30, 2015

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