Pore-forming proteins and peptides are ubiquitous in living organisms. They play a central role in bacterial pathogenesis, the immune response, venomous attack and innate immunity, by which means they are used to attack and eliminate other organisms. They have the extraordinary property of having two stable structural states. One corresponding to the secreted, soluble, diffusible, and usually monomeric, form. The other, adopted only upon cellular attack, is a membrane inserted, channel shaped, and usually oligomeric form. Since membrane insertion is self-assisted and does not require a chaperon or dedicated protein machinery, these molecules represent a gold mine for biochemists and biophysicists interested in the molecular steps leading to membrane insertion and channel formation. As self-assembling entities, capable of punching holes of well defined size in a lipid membrane, they have found a wealth of applications ranging from cell controlled permeabilization to intracellular drug delivery, and from the creation of chimeric antitumoral immunotoxins to the preparation of sophisticated elements for biosensors of metal ions or genetic material.

Pore-forming Peptides and Protein Toxins provides an essential source of information for graduate students and academic and industrial researchers in the fields of biochemistry, biophysics, toxicology and the pharmaceutical sciences.

About the Editors

Gianfranco Menestrina became Researcher at the University of Trento and then Research Director of the National Research Council (CNR, Institute of Biophysics). His main research interest is the interaction of proteins and peptides with lipid membranes and, in particular pore-forming toxins of either bacterial or animal origin. He has been visiting scientist at St.George's Hospital, London, UK, the University of Wisconsin, USA, and the University of La Habana, Cuba and is a member of the Biophysical Society (USA) and the International Society on Toxinology.

Mauro Dalla Serra, educated in Physics and following postdoctoral study at the University of Texas, College Station, USA, is currently Researcher at the ITC-CNR, Laboratory of Biomolecules and Biological Membranes, Institute of Biophysics, Trento, Italy. He is interested in the interaction between membrane-active peptides and proteins and the lipid bilayer. Understanding the mechanism leading to cell membrane destabilization is the main goal of his investigations. He enjoys working at the interface between physics and biology, giving his contribution in both basic science and biotechnology.

Philip Lazarovici is a Professor in the Department of Pharmacology, School of Pharmacy at the Hebrew University of Jerusalem, Israel and guest scientist at the Section on Growth Factors, National Institute of Child Health and Human Development (NICHD) of the NIH, Bethesda, Maryland, USA. After receiving his Ph.D. in toxicology from the Hebrew University, Professor Lazarovici became a post-doctoral fellow in neurobiology at the Weizmann Institute of Science, Rehovot, Israel and Visiting Fellow in Neurochemistry at NICHD in Bethesda. His research interests lie in the fields of neuropharmacology and neurotoxicity and in signal transduction of neurotoxins and neutrophins.

Volume 5 of the book series **Cellular and Molecular Mechanisms of Toxin Action.**

Series editor: **Philip Lazarovici**

Individual volumes in the **Cellular and Molecular Mechanisms of Toxin Action** series provide graduate students, research scientists at universities, biotech and pharmaceutical industries, regulatory agencies, clinicians and veterinarians with up-to-date information in the field of toxin research. The series will include monographs on signal transduction, secretory systems, the cytoskeleton and selective neurotoxicity of natural, recombinant and chimeric toxins, giving a broader emphasis on the mechanism of action, structure-function relationship, and use of toxins as research tools and their therapeutic applications.