

Showcase on Research

EDITORIAL

Proteases - Not just the cellular garbage men...

Intensive research over the last decade has started to reveal that proteases, far from simply being the means for acquiring or recycling amino acids, are in fact involved in sophisticated processes within the body that control many vital pathways. Well known examples of this, such as the clotting cascade, spring to mind quite easily, but it is now being established that many intracellular and extracellular processes have proteolytic events as part of their activation or control mechanisms. Not surprisingly, genome projects in a wide range of organisms reveal that we have many more proteases to study in a number of biological contexts. Also, proteases have been shown to interact with an increasing number of controlling and modulating molecules - future work should reveal many more fascinating mechanisms by which the molecules are regulated or adapted to play new roles.

Judith Clements from the School of Life Sciences, Queensland University of Technology introduces the discovery process by telling us about the discovery of novel members of the kallikrein family of serine proteases and their potential roles in health and disease. Geoff Stewart and colleagues from the Department of Microbiology, University of Western Australia then inform us that allergens from a variety of sources are in fact proteases! The article examines whether their allergenicity is linked to their enzymatic activity and provides a view of how exogenous proteases might interfere with fine balances in the host system. Eleanor Mackie, from the School of Veterinary Sciences, University of Melbourne, continues to expand the new view of proteases by introducing us to the protease-activated receptors and their continually expanding roles in the body. James Whisstock and colleagues, from the Department of Biochemistry and Molecular Biology, Monash University, then give us the final element, which is control of the proteases, exemplified in this article by the serpin superfamily of proteins. The four articles provide a snapshot of the different elements of the field in mid-expansion. Wherever will we go in the next few years and whatever fascinating new discoveries await us - a protease biochemist is a happy biochemist indeed!

Rob Pike

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Cover Illustration -

Protease-activated receptor against a background of serpin structures

The protease-activated receptors are activated by a cleavage event in their N-terminal domain, yielding a new N-terminus which acts as a tethered ligand that binds to the extracellular loops of the receptor and so activates it (for details see the review by Mackie in this issue). Multiple conformations of serpins are shown in the background. Each represents a structure which has been solved by crystallographic studies; further information on the different conformations can be found in the review by Whisstock and colleagues. The Figure was prepared by the combined talents of Ed Ghiocas from the University of Melbourne and James Irving of Monash University.

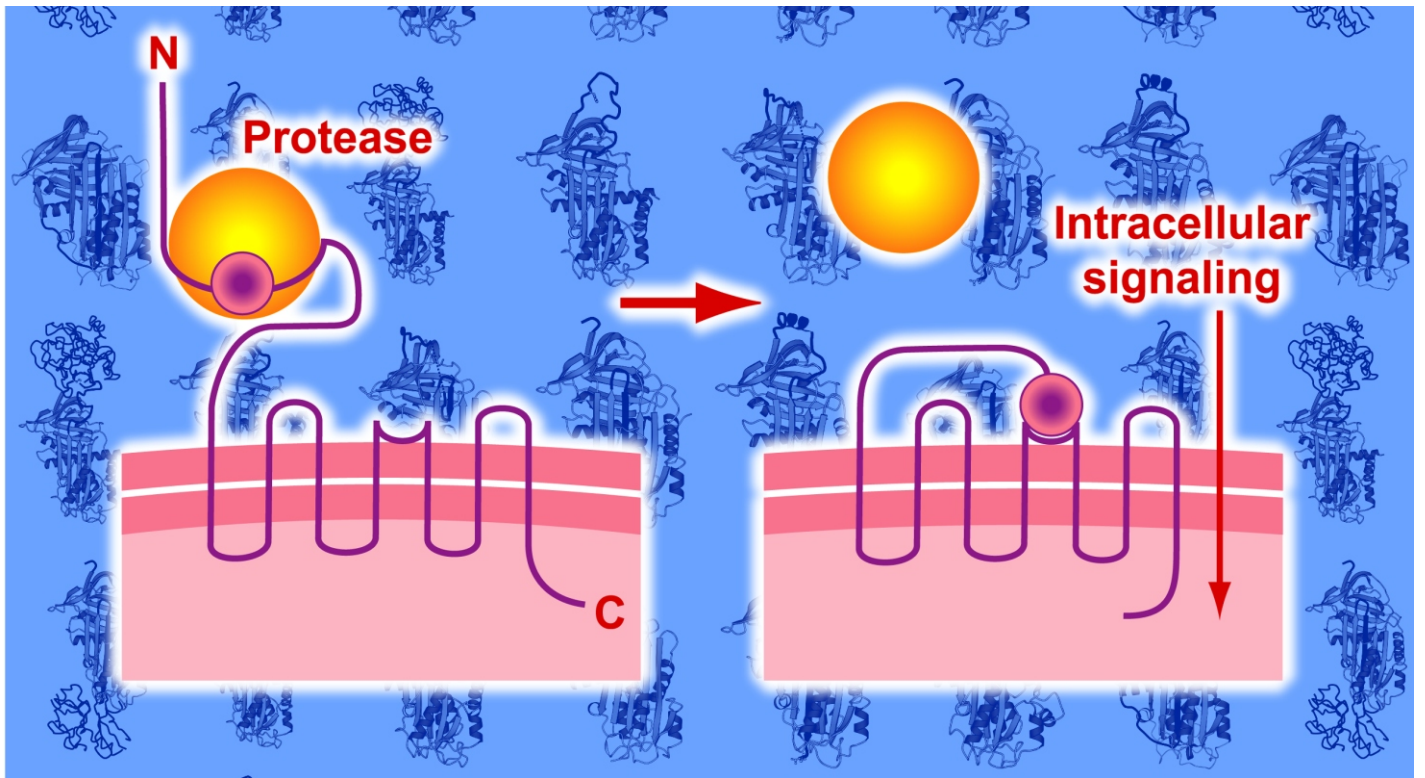
Proteases - Not just the cellular garbage men

Guest Editor: Rob Pike

- Human Tissue Kallikreins - Is their Function Solely Proteolytic?
Judith Clements
- Allergenic Peptidases: Enzymatic Activity and Immunogenicity
Geoffrey Stewart, Clive Robinson, Philip Thompson, N. Asokanathan, Peter Graham, Andrew McWilliam and Leslie Mathaba
- Protease-Activated Receptors: A Means of Converting Extracellular Proteolysis into Intracellular Signals
Eleanor Mackie
- Serpins: A Conformational Trap?
James Whisstock, Stephen Bottomley, James Irving, Phillip Bird and Robert Pike

Next Issue...

In April, Showcase on Research will be on **Inflammation** - Guest Editor: **David Hume**



Front Cover Image