



# Special Colloquium

**28<sup>th</sup> August 2014 - 14:00 h**

**CFEL Building, Seminar Rooms I-III (ground floor)**

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## **James Whisstock**

Department of Biochemistry and Molecular Biology, Monash University

### **Punching holes in cells – how members of the perforin-like superfamily function in immune defense and fruit-fly development**

The human immune system deploys a variety of essential weapons to destroy bacteria, virally infected cells, and cells that are developing malignant (cancerous) characteristics. Perforin and Complement component 9 (C9) are two such weapons; these molecules belong to a larger family of proteins that kill cells by forming large holes (pores) in the membrane of target cells.

In the first part of the talk, I will detail how we have used a combination of X-ray crystallography and cryo-Electron Microscopy to obtain a comprehensive picture of how perforin/C9 like proteins punch holes in cells.

Torsolike is the sole member of the perforin / C9 family that can be identified in the fruit-fly *Drosophila*. Surprisingly, rather than being essential for fighting infection, published studies show that torsolike plays an essential role in the development of head and tail structures during development of the early embryo.

In the second part of the talk I will detail our progress in using light microscopy together with molecular genetics to understand how a member of a protein family more usually associated with immune defense may function in controlling embryonic development.

Host: Henry Chapman – Coherent Imaging Division