

The Fluorescence Applications in Biotechnology and Life Sciences Network
and the
Australian Key Centre for Microscopy and Microanalysis, The University of Sydney
invite you to a seminar on

“Using Photonics to Solve Biological Questions”

Dr Sarah Russell
Peter MacCallum Cancer Centre

Friday 12th October 2007, 11am – 12.30pm

WHERE: The University of Sydney, Madsen Building F09, Room LG92A/B

(please see www.emu.usyd.edu.au/emu/contact.php for directions)

Abstract

It has become clear that polarity plays a vital role in dictating the function and fate of T cells. Recent studies suggest two important means by which T cell polarity determines functional outcome. Firstly, the polarization of the cell towards one extracellular signal allows a T cell to focus on that signal at the expense of others, so that changes in the axis of polarity allow T cells to switch from one signal to another. Secondly, it now appears that if a T cell establishes stable polarization towards a particular signal, this can dictate a molecular asymmetry during cytokinesis, enabling the production of daughter cells with different functional and developmental fates. These newly identified phenomena offer rich potential for understanding how immunity is regulated, and for the design of new therapeutic interventions. Elucidation of the mechanisms by which polarity regulates lymphocyte function will require new technologies that measure and manipulate molecular activities within an intact cell.

T cell development and function is coordinated by signals from neighboring cells, soluble factors or extracellular matrix. Many T cell signaling pathways have been defined, but the integration of these signals into a net response that dictates functional outcomes has not yet been elucidated. We propose that cell polarity is an important determinant of the integration of signals, and have recently demonstrated that competition for polarity dictates the receptiveness of a T cell to different extracellular signals.

We have identified a set of proteins that coordinate to regulate T cell polarity. We and others have also demonstrated a novel means by which polarity orchestrates T cell differentiation and function.

Sarah Russell

Sarah did her PhD in immunology at the University of Melbourne, and then worked with Dr Warren Leonard (National Institutes of Health, USA) and made a number of seminal discoveries related to interleukin-2 receptor (IL-2R) signalling in T cells. Sarah returned to Australia as an R.D. Wright Postdoctoral Fellow in 1997, and established her own group and relocated to the Peter MacCallum Cancer Centre in 2000. Supported by a Wellcome Senior Research Fellowship, she established a program of research into the regulation of T cell polarity, and the role of polarity in controlling signalling responses. This work depends heavily upon the use of sophisticated imaging technologies, and to facilitate this Sarah has recently established a second laboratory with the Centre for Micro Photonics at Swinburne University of Technology.

The ARC Network for **Fluorescence Applications in Biotechnology and Life Sciences** (FABLS) inspires and coordinates research programs relating to applications of fluorescence that require a high degree of interaction between biology, physics, chemistry, bioengineering and medicine. The FABLS network includes over 325 researchers and industry representatives from Australia and around the world.

This is a free event

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By 10 October 2007