

“INFECTION AND IMMUNITY” SEMINAR SERIES



INFECTIOUS DISEASES AND
IMMUNOLOGY
SYDNEY MEDICAL SCHOOL

MARIE BASHIR INSTITUTE FOR
INFECTIOUS DISEASES AND
BIOSECURITY



WEDNESDAY, 31 MAY 2017

1 PM – 2 PM

**A SANDWICH LUNCH WILL BE
PROVIDED FROM 12.40 PM**

**SEMINAR ROOM, LEVEL 6
THE HUB, CHARLES PERKINS
CENTRE**

A/PROF CYNTHIA WHITCHURCH
**Director of the Microbial
Imaging Facility at the ithree
Institute, University of
Technology**

will be presenting a seminar entitled:

***Roles of bacterial morphotype
plasticity in infection.***

Please make every effort to attend
and encourage your colleagues to
do likewise.

The Infection and Immunity Seminar Series aims to bring together researchers to present and discuss research findings, concepts and technologies with the goal of fostering enhanced interactions and new collaborations between researchers.

In addition to local speakers, this seminar series will also include high-standing invited, external speakers. All research staff and students are encouraged to attend.

**For more information or to be
placed on the mailing list, please
contact Associate Professor Barry
Slobedman, Infectious Diseases
and Immunology**

barry.slobedman@sydney.edu.au



ABSTRACT

A major contributor to the ability of pathogenic bacteria to resist the actions of antibiotics and host immune defenses is their ability to transition between different lifestyles. These are survival strategies that occur in response to a range of environmental stresses such as nutrient deprivation, oxidative stress, predation, immune attack, antibiotic exposure and inter- and intra-species competition. Examples of these alternate lifestyles include matrix-encased biofilms that can be up to 1000 times more resistant to antibiotics than their planktonic counterparts; self-organised collective behaviours such as twitching and swarming motilities that lead to rapid biofilm expansion; and morphotype transitions. We have recently determined that *Pseudomonas aeruginosa* undergoes morphological transitions from normal rod-shaped cells to spherical cells via two different mechanisms. One of these mechanisms is extremely rapid; occurs in only a sub-set of cells and leads to explosive cell lysis events that are responsible for the release of cellular content including eDNA, moonlighting proteins and membrane vesicles. The other spherical cell morphotype transition is slower, reversible, occurs *en masse* in response to beta-lactam antibiotics and leads to the formation of cell wall deficient L-forms that survive and proliferate in the presence of high concentrations of antibiotics. We are currently exploring the roles of each of these morphotype transitions in infection by *P. aeruginosa*.