

Seminar in Microbiology

Monday, October 10, 2016

Salle de séminaire, E07.3347.a, CMU

11:30 – 12:30

Prof. Simon J Foster

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***Staphylococcus aureus* infection dynamics**

The pathogen *Staphylococcus aureus*: *S. aureus* is a major cause of death and disease in humans. The spread of antibiotic resistance (MRSA, VRSA) highlights its importance. Our research has taken a number of approaches to understand the pathogenesis of the organism and to develop new prophylactic and treatment regimes. Research is aimed at determining how *S. aureus* interacts with its host. In particular we have been determining the role of human innate defences in the control of *S. aureus*. We have also identified a number of potential novel targets to be exploited as vaccine components. The role and use of these for prophylaxis are the subject of current investigations.

Bacterial cell wall structure and function: The cell wall peptidoglycan is essential for the life of most bacteria and its synthesis is the target of such important antibiotics as penicillin and vancomycin. We are using atomic force microscopy and other super-resolution microscopy techniques to determine the architecture and dynamics of peptidoglycan across the bacteria. This has revealed a hitherto unexpected complexity leading to new models of cell wall growth and division.

<http://www.imagine-imaginglife.com/simon-foster.html>

Selected recent publications:

García-Lara et al., 2015, Supramolecular structure in the membrane of *Staphylococcus aureus*. Proc Natl Acad Sci U S A. 2015 Dec 22;112(51):15725-30

Wheeler et al., 2015. Bacterial Cell Enlargement Requires Control of Cell Wall Stiffness Mediated by Peptidoglycan Hydrolases. MBio. 2015 Jul 28;6(4):e00660.

Neumann et al., 2015. The effect of skin fatty acids on *Staphylococcus aureus*. Arch Microbiol. 2015 Mar;197(2):245-67.

Bottomley et al., 2014. *Staphylococcus aureus* DivIB is a peptidoglycan-binding protein that is required for a morphological checkpoint in cell division. Mol Microbiol. 2014 Oct 7. doi: 10.1111/mmi.

McVicker et al., 2014. Clonal expansion during *Staphylococcus aureus* infection dynamics reveals the effect of antibiotic intervention. PLoS Pathog. 2014 Feb 27;10(2):e1003959.