Joint Seminar by the Department of Chemical Engineering and the Centre for BioSystems Science and Engineering

S E M I N A R

at 04:00 PM on May 22, 2017
Chemical Engineering, Seminar Hall

Adventures in Super-Resolution Imaging

Prof. Daniel Coombs

University of British Columbia

Immune cell receptors are known to be mobile in the cell plasma membrane, and their mobility and distribution is known to affect signalling and ultimately the immune response to infection. Over the last few years we have been studying the spatiotemporal dynamics of individual B cell receptors on live B cells using single-particle tracking techniques in total internal reflection (TIRF) microscopy. In parallel experiments, we have also been using the super-resolution technique of Stochastic Optical Reconstruction Microscopy (STORM), enabling us to resolve individual BCR to sub-10nm resolution, and make precise statements about receptor clustering. In this talk I will describe the experimental microscopy techniques, some difficulties we have overcome, and outline mathematical and computational approaches that we use to extract the maximum amount of reliable, reproducible information from techniques that are essentially stochastic

About the speaker:

Daniel Coombs is a professor of Mathematics at the University of British Columbia in Vancouver, Canada, where he has been employed since 2003. He primarily works on immune cell surface receptor dynamics, immune cell signalling, and intra- and inter-host dynamics of infectious diseases. Dr. Coombs received his PhD from the University of Arizona and was a postdoctoral fellow at Los Alamos National Laboratory from 2001-2003.