

On Wednesday 24th May 2017 at 1 pm
at DTU Lyngby Campus, Anker Engelunds Vej 1, 2800 Kgs. Lyngby,
building 101A, Meeting room S01 (ground floor),
Evan Newell will give a lecture on

High-dimensional cellular immune profiling in health and disease

Evan Newell, Agency for Science, Technology and Research (A*STAR),
Singapore Immunology Network (SIgN)

Abstract: Blood and tissue samples taken as part of clinical studies and trials can provide critical information on the roles of the immune response in patient outcome. However, the cellular compositions of these samples are often highly diverse, and important information can be lost if rare cells are overlooked. For instance, antigen specific T cells are critical initiators and orchestrators of the adaptive immune response, but cells specific for any given pathogen or cancer can be exceedingly rare, especially in blood. Here, the utility of high dimensional mass cytometry analysis together with rapidly evolving computational analysis tools will be discussed in the context of various mouse and human cellular subsets. A major advantage of this approach is the ability to directly analyze relationships between categories of cellular characteristics. This is particularly relevant for the study of T cells, whose phenotypic markers can be intuitively segregated into a number of categories such as antigen-specificity, differentiation state, functional capacity, and trafficking receptor profiles. All of these can be measured simultaneously on individual cells through the use of metal-labeled monoclonal antibodies and highly multiplexed combinatorially-coded peptide-MHC tetramers. We are currently analyzing T cell responses in chronic hepatitis B viral infection and cancer in human patients and mouse models. Our results show that relevant T cells can be quickly identified, and that their characteristics could be useful as biomarkers of disease state and outcome.

Bio: Evan Newell completed his B.Sc. in Immunology at McGill University and Ph.D. in Physiology at the University of Toronto. As a post-doc at Stanford University with Mark Davis he worked on biophysical aspects of T cell antigen recognition and initiated the use of mass cytometry for the study of human T cell responses. Now as a principal investigator at the Singapore Immunology Network (SIgN), his lab continues to apply and develop novel approaches for identifying and thoroughly characterizing antigen-specific T cells. This includes the development of combinatorial peptide-MHC tetramer staining used in conjunction with mass cytometry for in-depth analysis of cellular phenotype and function. A major goal of lab is to identify useful biomarkers of clinical outcomes that take advantage of these modern approaches with particular focus on human chronic infection and cancer.