

NUS Yong Loo Lin School of Medicine Immunology and Precision Medicine TRP Research Seminar

A systems genetics approach in autoimmunity

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In autoimmune disorders, a complex network of immune cell interactions contributes to disease pathophysiology. Although autoimmune disease can be explained by genetic variants, we lack mechanistic insights in the effector immune cells for efficient and timely translational studies. I will present an overview on how systems genetics can be useful for gene identification and biology of immune cells such as macrophages in autoimmunity. A single nucleotide polymorphism in GSDMA affects the transcription of this gene in monocyte/macrophage compartment and associates with systemic sclerosis (SSc). Furthermore, systemic lupus erythematosus (SLE) patients CD8 T cells can be stratified according to their type I interferon transcriptome, which can further inform on the mitochondrial function, bioenergetics and NAD/NADH status of these cells. Systems genetics in animal models were instrumental for understanding and targeting immunometabolism in macrophages. In summary, genetic heterogeneity can be efficiently utilized for identifying and targeting cellular mechanisms that lead to inflammatory disease.

About our speaker

Dr Behmoaras has recently joined Duke-NUS Medical School as an Associate Professor, from Imperial College London. His primary focus is to understand and target macrophage biology in complex inflammatory disorders, including autoimmune disease and metabolic syndrome. Prof Jacques has completed his PhD in University of Paris V where he worked on genetics of cardiovascular disease. He joined Imperial College London in 2005. As a postdoc and Junior Research Fellow at Imperial, he undertook positional cloning studies in autoimmune glomerulonephritis and secured his PI position in 2010. Using systems genetics approaches, his group revealed the primary role of macrophage gene and metabolic networks in chronic inflammatory and fibrotic disease. Some examples of this approach include the importance of targeting macrophage leucine, iron and NAD metabolism. More recently, Prof Jacques' group has initiated research programs aiming to reduce low-grade inflammation during ageing and obesity through macrophage immunometabolism and senescence. The group has some unique tools that combines reproducible rat models of inflammatory disease/ageing with metabolomics/lipidomics approaches in human macrophages.



12PM – 1PM

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**MD4 Level 2 Seminar
Room**



Immunology Translational Research
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