

SMART Infectious Diseases (SMART ID)



Programme Leader



Prof Chen Jianzhu,
Massachusetts Institute of
Technology

Prof Chen, Cottrell Professor of Immunology at MIT, is also a co-director of the Center for Infection and Immunity, the Chinese Academy of Sciences. He received a B.S. degree from Wuhan University in China and a Ph.D. in Genetics from Stanford University in 1990.

ID IRG is one of the five IRGs in the Singapore-MIT Alliance for Research and Technology (SMART) Centre. ID IRG started in July 2007 (Phase II started in Jan 2013) and is a research programme funded by the National Research Foundation (NRF), under its Campus for Research Excellence and Technological Enterprise (CREATE) programme.

Research

SMART ID IRG proposes to tackle some of the major challenges in dengue, malaria and bacterial infections by 1) expanding the infectious disease knowledge base through discovering novel mechanisms of pathogen-host interactions, 2) translating these findings into interventions, especially vaccines, in animal models of human infection and into human studies, and 3) building a culture of translational science and biomedical entrepreneurship so as to move scientific discoveries and inventions into the commercial realm to directly impact human health.



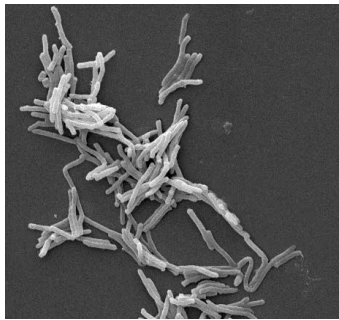
Researchers

There are a total of 45 researchers in SMART ID IRG, consisting of post-doctoral fellows, research associates and PhD students. Leading the research teams are a total of 17 Principal Investigators (PIs), seven of whom hold faculty appointments at MIT, three at NTU, six at NUS and one at Novartis Institute for Tropical Diseases.

Highlights

■ Development and Commercialization of the Humanized Mouse Technology:

SMART ID IRG employs an array of bioanalytical platforms and modelling algorithms to develop and validate early, prognostic molecular signatures that characterize Dengue Fever. These features can then be used to predict the likelihood of Dengue Fever developing into Dengue Hemorrhagic Fever, as well as to use as clinical markers of efficacy in clinical trials.



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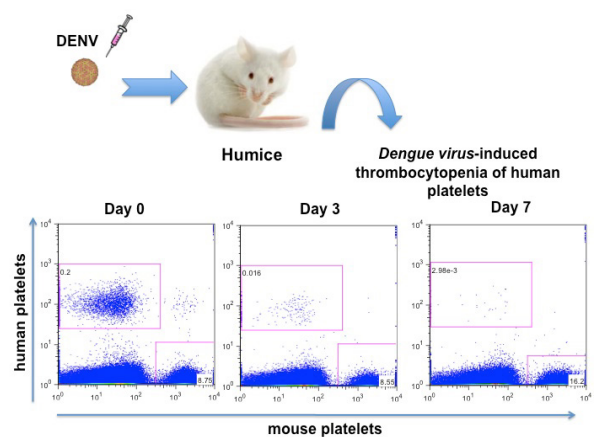
SMART ID IRG has developed and optimized humanized mice – mice stably engrafted with human cells and tissues, especially the cells of human immune system - and has successfully modelled infections for dengue virus, malaria parasite, and Epstein Barr Virus (EBV), to which there has been no small animal models. A start-up company, New Paradigm Biosciences Pte Ltd, has been spun off to commercialize the humanized mouse technology.

■ RBCs biological and mechanical alteration caused by Malaria parasite

SMART ID IRG's Malaria program will elucidate the role of parasite-altered biological as well as mechanical properties of infected RBCs in disease pathogenesis by examining the molecular basis of cell adhesion and how it contributes to disease pathology, including sequestration in the deep tissues and clearance in the spleen.

■ Novel anti-microbial drug development

Previous studies in other microbes has revealed that the inability to reprogram the tRNA makes cells susceptible to elimination by the host immune system. SMART ID IRG aims to define the biosynthetic pathways of these critical tRNA modifications to identify candidate drug targets.



For more information about the SMART ID IRG, please contact: Dr Farzad Olfat (farzad@smart.mit.edu)
Website: <http://smart.mit.edu/research/infectious-diseases/infectious-diseases.html>