

Seminar

A*STAR ID Labs x Open Research Europe presents:

Anopheles immunity and pathogen transmission: Genetics, function and evolution

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The Pasteur Institute

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Content
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Malaria is as old as humanity, while many arboviruses have only been known for decades. However, new vector-borne disease emergence and epidemics are probable, and for most vector-borne diseases, vector control is the only or most effective means of control. Research results are presented on the genetic basis underlying malaria transmission by the African *Anopheles gambiae/coluzzii* vector population. A minority of individuals are genetically the most susceptible to infection and are probably responsible for the majority of malaria transmission in nature. Genetic data highlighted candidate genes for functional study, and also lead to the study of non-coding transcriptional enhancers as potential causative polymorphisms underlying vector susceptibility to malaria infection. Though *Anopheles* mosquitoes are the only vectors of human malaria, they are the primary vector of just one known arbovirus, o'nyong-nyong virus (ONNV), as compared to *Aedes* mosquitoes, which transmit many viruses. Both *Aedes aegypti* and *Anopheles gambiae/coluzzii* are strongly human-biting in nature, and both are exposed to arboviruses, so behavior does not explain the difference. The *Anopheles* antiviral response is highly compartmentalized and deploys distinct tools in the primary midgut infection and the disseminated infection after midgut escape. We are studying the molecular mechanisms underlying the *Anopheles* antiviral defenses, including the potential risk that *Anopheles* species could become more prominent arbovirus vectors in the future.

Dr Kenneth Vernick obtained his PhD in molecular and cell biology with a focus on molecular entomology at the US National Institutes of Health. He moved to the New York University School of Medicine Department of Molecular Parasitology in 1997, to the Microbial and Plant Genomics Institute of the University of Minnesota in 2004, and from there to the Institut Pasteur in 2007. At the Institut Pasteur he created the Research Unit on the Genetics and Genomics of Insect Vectors and was named director of the Department of Parasites and Insect Vectors. His laboratory is interested in vector-pathogen interactions, insect immunity, and pathogen transmission as outcomes of the evolution and ecology of natural populations. He is coordinator of the European vector consortium, Infravec2.

Questions? Contact us at seminars@idlabs.a-star.edu.sg

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