



**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

On

Modeling of Genetic or Sterilizing Approaches in Fighting Mosquito-Borne Diseases

by

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Abstract

To prevent the transmission of malaria or other mosquito-borne diseases, an effective weapon is to use genetically-altered (transgenic) mosquitoes, or mosquitoes carrying genetically-modified bacteria, that are resistant to the infection, to replace the wild mosquitoes, or to release sterile mosquitoes to reduce the wild mosquito population. To study the impact of these mosquitoes mixing with wild mosquitoes on the diseases transmission, we formulate simple mathematical models of interactive wild and transgenic mosquitoes. We consider both dominant and recessive transgenes for transgenic mosquitoes, horizontal and vertical transmissions of genetically-modified bacteria. We also consider different strategies in releasing sterile mosquitoes. With fundamental analysis of the model equations, we investigate their interactive dynamics of the different types of mosquitoes, and demonstrate the rich dynamical features of the models by numerical examples.

Date : 22 May, 2013 (Wednesday)

Time : 3:00 p.m. – 4:00 p.m.

Venue : HJ610, The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * * ***