The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

On
Models of tumor growth and therapy
by

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Abstract: Models of tumor growth are now commonly used to predict the evolution of cancers, based on images for instance.

These models serve to predict the evolution of the disease in medical treatments, to understand the biological effects that permit tumor growth and decide of the optimal therapy. A more recent subject is to explain emergence of resistance to drug and its implication in therapeutic failures.

These models contain several levels of complexity, both in terms of the biological and mechanical effects, and therefore in their mathematical description. The number of scales, from molecules to the organ and entire body, explains partly the complexity of the problem.

In this talk I shall give a general presentation of the field and focus on two aspects. I shall firstly present a multiscale approach to mechanical models of tumor growth and secondly, models of resistance to therapy and treatment optimization.

The part on Hele-Shaw is a collaboration with F. Quiros and J.-L. Vazquez (Universidad Autonoma Madrid), M. Tang (SJTU) and N. Vauchelet (LJLL). The part on adaptation and resistance is a collaboration with O Diekmann, P.-E. Jabin, S. Mischler, A.Escargueil, J.Clairambault, T.Lorenzi, A.Lorz, G.Barles, S.Mirrahimi, P. E. Souganidis, V.Calvez.

Biography: The research of Professor Benoit Perthame is in nonlinear PDEs and their applications to biology. He has received many prestigious awards and prizes, among which includes ``**Prize Pecot, Silver Medal of the CNRS, Blaise Pascal Medal from Eurasc**. He was an invited speaker of **ICM (1994), plenary speaker of ICM (2014) and of ICIAM 2011**. He serves on the editorial board of many top mathematical journals such as ``SIAM J. Math. Anal., Commu. in P.D.E., M3AS'' and so on.

Date : 25 September, 2014 (Thursday)
Time : 3:30p.m. – 4:30p.m.
Venue : TU717, The Hong Kong Polytechnic University

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