UC RIVERSIDE UNIVERSITY OF CALIFORNIA

Distinguished Lecture in Mathematical Biology

March 15th, 2017

Surge Building, Room 284
Coffee/Tea & Fruit/Pastries Served: 3:40 p.m.
Lecture: 4:10 p.m. - 5:00 p.m.

Dr. Philip Maini, FRS

Professor of Mathematical Biology
Head of the Wolfson Centre for Mathematical Biology
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Collective Cell Motion in Biology

The coordinated movement of cell populations is of vital importance in biology, for example during normal development, wound healing and disease (such as cancer). In this talk, I will consider some applications of mathematical modelling to this phenomenon. In the embryo, cells from the neural crest have to move from the neural tube to the branchial arches - how this is controlled is not known. We will show how a discrete-based cellular automaton model, combined with an experimental program, has led to new insights into this problem. I will then consider the problem of angiogenesis, the process by which a tumour acquires new vasculature, and derive partial differential equation (PDE) models from a master equation approach. These will be compared with the phenomenologically derived PDE models commonly used in the literature.

Bio: Philip K. Maini received his B.A. in mathematics from Balliol College, Oxford, in 1982 and his DPhil in 1985 under the supervision of Prof J.D. Murray, FRS. He spent a year teaching at Eton College before returning to Oxford in 1987 as a postdoc at the WCMB and a Junior Research Fellow at Wolfson College. In 1988 he was appointed Assistant Professor in the Mathematics Department at the University of Utah, Salt Lake City. In 1990 he returned to Oxford as a University Lecturer and in 1998 was appointed Professor of Mathematical Biology by Recognition of Distinction and Director of the WCMB. In 2005 he was appointed Statutory Professor of Mathematical Biology. He is on the editorial boards of a large number of journals, including serving as the Editor-in-Chief of the Bulletin of Mathematical Biology [2002-15]. He has also been an elected member of the Boards of the Society for Mathematical Biology (SMB) and European Society for Mathematical and Theoretical Biology (ESMTB). He is a Fellow of the IMA, a SIAM Fellow, a Fellow of the Royal Society of Biology (FRSB), and Miembro Correspondiente, La Academia Mexicana de Ciencias (AMC). In 2015 he was elected Fellow of the Royal Society (FRS). His present research projects include the modelling of avascular and vascular tumours, normal and abnormal wound healing, and a number of applications of mathematical modelling in pattern formation in early development, as well as the theoretical analysis of the mathematical models that arise in all these applications. He has over 300 publications in the field.