Preface

Special issue: Mathematical Methods in the Biosciences

Guest editors: Alberto A. Pinto and Jorge P. Zubelli

Gathering this special issue honouring Prof. David Rand was a great pleasure due to the impact of his work as well as a challenge due to the variety of topics covered by the present volume. It was also quite touching since Alberto Pinto was his PhD student and throughout the years kept an ongoing collaboration together with a deep friendship. David's mentoring and generosity were of tremendous importance for Alberto Pinto's career as well as those of many of the contributors to this issue.

David Rand is a professor of Mathematics at the University of Warwick and a member of the Zeeman Institute SBIDER. He is a member of the Steering Group of the EPSRC funded Doctoral Training Centre, MathSys, and has been an associate director of 4 other mathematical and biological CDTs funded by the UK research councils.

Until 1995 his primary research field was dynamical systems for which he was awarded the London Mathematical Society's Whitehead Prize. During this period with his collaborators he discovered and characterised modulated waves in fluids, provided the topological classification of unimodal maps, discovered the fine-scale structure of the universal transition from quasi-periodic dynamics to chaotic behaviour in dissipative systems, and created a rigorous formulation of the thermodynamic formalism for multifractals.

Since then he has been working at the interface between mathematics and biology and this work has been recognized by the award in 2005 of a prestigious EPSRC Senior Research Fellowship. In particular, in earlier work he has contributed to the study of spatial systems in ecology, epidemiology and evolutionary theory and has developed new mathematical approaches, such as pair approximations, to develop tractable mathematical models. More recently, together with leading experimental laboratories, he has developed substantial systems biology programmes in areas such as circadian rhythms, NF-kappaB signaling, cancer chronobiology, gene transcriptional mechanics and, most recently, developmental biology.

He has developed a range of mathematical tools for the analysis of complex biological systems particularly where dynamics is involved, and, with Bärbel Finkenstädt (Statistics, Warwick), he has developed new statistical techniques for the analysis of transcriptional and other molecular data. He is now a fully committed systems biologist. His work has been primarily funded by EPSRC, BBSRC, the EU and the Wellcome Trust.

For six years until 2006 he was Chair of Warwick's Mathematics Institute. Previously Rand had led the development of Applied Mathematics at Warwick and took it from almost nothing in the early 80s to its present strength. He instigated Warwick's mathematical interdisciplinary programme MIR@W from which many of Warwick's successful interdisciplinary initiatives have emerged. More recently he led the creation of Warwick's Systems Biology Centre and helped create the Zeeman Institute SBIDER which brings together the mathematical research at Warwick on biological systems including systems biology and epidemiology. He has served on numerous national and international committees and advisory bodies.