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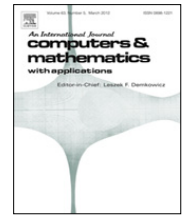
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Foreword

The vast diversity of topics that appear in this special issue BIOMATH 2011 is indicative of how mathematical biology is permeating more and more branches of science. The field now ranges from very technical mathematical and computational advances required to analyse models arising from biology to directly applicable field and clinical studies. As the biological sciences present totally novel challenges, traditional differential-equation approaches in applied mathematics have had to extend to incorporate stochasticity, hybrid systems and multiscale analysis, but in non-standard ways, due to the inherent complexity of biological systems. At the same time, advances in computation now mean that more biologically realistic models can be computed but, as realism grows these advances are still not sufficient, resulting in the need to develop new numerical techniques. In short, biology has hugely stimulated the fields of mathematics and numerical analysis.

It is fair to say that most biologists still view mathematics with an air of scepticism, with mathematical modelling being more readily accepted in areas where it has been demonstrated to lead to scientific insight, such as in ecology and certain branches of physiology, not forgetting the role that statistics and bioinformatics have played at the gene and protein level. However, a growing number of biologists are now interacting with mathematicians and, indeed, seeking out active collaboration so that we are seeing a paradigm shift in applied mathematics where the *real* application is being emphasized. This requires a new generation of mathematicians who have a breadth of scientific knowledge as well as a depth of mathematical expertise and the challenges faced by this younger cohort in our mainly discipline-bound university structure need to be recognised and overcome.

Despite all these difficulties, the subject area is so exciting that it is attracting more and more young people and so the future is very bright. At the same time, in these economically harsh times, funding is being directed into interdisciplinary areas which presents many opportunities for mathematicians.

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