

PREFACE

This is the volume of selected works of the BIOMAT 2007 International Symposium on Mathematical and Computational Biology. The BIOMAT Symposia is known all over the world as a series of international interdisciplinary conferences which are held annually since the year 2001. The series is also the oldest in Latin America to assemble together professionals from diverse educations to exchange their expertise in the topics of biomathematics and the general study of biosystems. The two days of pre-conference tutorials are aimed to motivate young candidates to scientific research in these interdisciplinary areas and are lectured by selected teachers among the best representatives of the tutorial research topic. Every year the structure of symposia, including tutorials and technical sessions, has been proved to be efficient for motivation of future scientific careers and the feedback obtained by senior scientists from their peers.

The BIOMAT 2007 Symposium was held in the city of Armação dos Búzios, an internationally famous beach resort in the State of Rio de Janeiro, Brazil. There were fourteen Keynote Speakers coming from Europe, Asia, Africa and Americas. We have been most honoured with the presence and collaboration of a scientist with the scientific status of Prof. Kerson Huang, a very famous master of Statistical Mechanics. The author of many important contributions to the scientific literature and famous textbooks used by research students of five continents. We had also about hundred and forty submitted works and an 18 % – 22 % level of acceptance. The accepted papers in full version have been presented in oral and poster continuous sessions. It is worth while to register the deep impact that these sessions have promoted in joint publications of some participants.

As a rule in the BIOMAT Symposia, the set of selected papers is a fruitful combination of state of art research and some review approaches. They can be grouped in the areas of Mathematical Biology, Biological Physics, Biophysics and Bioinformatics. There are new results on some aspects of Lotka-Volterra equations, the proposal of using Differential Geometry to model neurosurgical tools, recent data on Epidemiological Modelling, Pattern Recognition and comprehensive reviews to the Structure of Proteins,

the Folding Problem and the influence of Allee effects on Population Dynamics.

The book contains some original results on the growth of gliomas. The role played by membranes channels on activity-dependent modulation of spike transmission. A proposal for reconsidering the concept of gene and the understanding of the mechanism responsible for gene expression. Some useful ideas for the modelling of ordered sets of atom sites. The comparison of agent-based models with the approach of differential equations on the study of selection mechanisms in Germinal Centres. The synchronization phenomenon for Protocell systems driven by linear kinetic equations.

We are indebted to the Board of Trustees of two Brazilian sponsoring agencies: Coordination for the Improvement of Higher Education Personnel CAPES and Foundation for Research Support of Rio de Janeiro State. We thank PETROBRAS, the Brazilian Oil Company and the world leader of oil research on deep sea waters and the PETROBRAS-CENPES Research Centre. The financial contribution from PETROBRAS-CENPES has been specially helpful in this edition of the BIOMAT Symposia series. We thank the directors and representatives of these institutions: Prof. Emídio Cantídio de Oliveira Filho, Prof. Zena Martins, Prof. Paulo Sérgio Parro, from CAPES; Prof. Jerson Lima from FAPERJ; Dr. Gina Vasquez, Dr. Humberto Magalhães from PETROBRAS-CENPES.

On behalf of the Editorial Board of the BIOMAT Consortium, we thank all the authors, participants, sponsors and collaborators of the BIOMAT 2007 Symposium. The success of this conference series has been also framed by their special consideration.

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President of the BIOMAT Consortium

Rio de Janeiro, December 2007