

Preface

This volume of the Springer book series Lecture Notes in Bioengineering includes the proceedings of the 2nd Workshop on Bionanomaterials, BIONAM 2016, held on October 5–6, 2016, in Salerno, Italy. BIONAM has been focusing on the analysis, synthesis and design of bionanomaterials, with its first edition held in 2013 in Salerno. After the success of this edition, the second edition has been jointly organized with WIVACE 2016, a Workshop on Artificial Life and Evolutionary Computation, with the purpose of involving (more) research on multidisciplinary and experimental fields such as systems chemistry and biology, and emerging topics such as origin of life as well as chemical and biological smart networks. BIONAM merges the biophysicists', the biochemists' and bioengineers' perspectives, covering the study of the basic properties of materials and their interaction with biological and environmental systems, the development of new devices for medical purposes such as implantable systems, and new algorithms and methods for modeling the mechanical, physical or biological properties of biomaterials. This challenging task requires powerful theoretical and computational tools to understand and control the inherent complexity of the interactions between synthetic and biological objects.

The interaction between the WIVACE and the BIONAM communities resulted in a joint session where the experimental work has been harmonized in a well-established theoretical framework; some selected contributions, having a more theoretical character, have been collected in the part *Modelling of Bionanomaterials* of this volume. The volume includes two further parts: *Nanomaterials Engineering* and *Applications of Bionanomaterials*, both accounting for more applicative and technical aspects of nanomaterials.

The BIONAM 2016 volume reports on selected experimental contributions and computational ones, derived from a close interaction between chemical scientists and the bioengineers involved in bionanomaterials studies.

Events like BIONAM are a good opportunity for both new generation and young scientists: to get in touch with new subjects and bring new ideas to the attention of senior researchers; and to highlight and promote the work of the youngest participants. At this purpose, we awarded Dr. Emiliano Altamura and Dr. Francesco Milano for the best poster presentation. Their contribution was selected as full papers and appear in

this volume under the title *Modelling Giant Lipid Vesicles designed for Light Energy Transduction*.

As Editors, we wish to express gratitude to all the conference attendees and chapters' authors. We also acknowledge the priceless work of the reviewers and of members of the Program Committee. Special thanks go to the invited speakers **Nicola Tirelli** from the University of Manchester (England) and **Gaetano Guerra** from the University of Salerno (Italy), for their very interesting and inspiring talks.

The 15 papers included in this book have been thoroughly reviewed and selected out of 34 submissions. By covering topics such as *evolutionary computation*, *bioinspired algorithms*, *genetic algorithms*, *bioinformatics and computational biology*, *modelling and simulation of artificial and biological systems*, *complex systems*, *synthetic and systems biology* and *systems chemistry*, they represent the most interesting contributions to the 2016 edition of BIONAM.

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Stefano Piotto
Federico Rossi
Simona Concilio
Ernesto Reverchon
Giuseppe Cattaneo

Advances in Bionanomaterials

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Piotto, S.; Rossi, F.; Concilio, S.; Reverchon, E.;

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