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ADVANCES IN
BIOMEMBRANES AND LIPID SELF-ASSEMBLY

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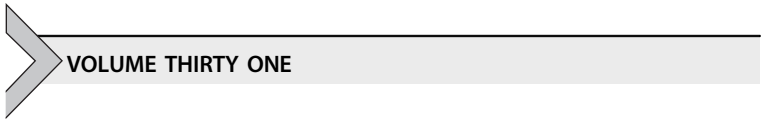

ADVANCES IN
BIOMEMBRANES AND LIPID SELF-ASSEMBLY

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Preface

Volume 31 of Advances in Biomembranes and Lipid Self-Assembly (*ABiLSA*) presents a broad and exciting spectrum of different contributions touching the research fields of biophysics and biochemistry of membranes (Chapter 1 and 2), dives into the complex research area of membrane protein complexes and pore-forming proteins (Chapter 3 and 4), and finally highlights the strength of biomembrane structure research for a deeper understanding of preclinical conformational diseases such as Alzheimer (Chapter 5).

Mainly focusing on Fourier transform infrared and polarization micro-Raman spectroscopy, Julia Genova and collaborators unveil the specific physical characteristics of the lipid membrane in presence of cholesterol on a detailed molecular level with a strong emphasis on the role of hydrogen bonding. Hemant Kashyap and co-workers present various impacts of small polar molecules and novel solvents on the structure and stability of biomembranes with a particular attention to alterations of the physiochemical properties of plasma membranes, leading to applications in tailor-made novel solvent molecules relevant to pharmaceutical industries and biophysics. Katia Cosentino's group describe state-of-the-art powerful single-molecule imaging tools that allow a profound quantitative characterization of the assembly of protein complexes. Here, accurate knowledge of the mechanisms of assembly of protein complexes is essential to understand their structure, stoichiometry and control their function. Carlos Alvarez and colleagues investigated actinoporins, which are pore-forming proteins produced by sea anemones. Secreted in soluble form, they undergo conformational changes leading to pore-formation in the cell membrane, which we are still far from fully understanding. Norbert Kučerka and collaborators concentrated their latest model membrane work on their elasto-mechanical properties providing first insights into preclinical diseases such as Alzheimer's disease (AD). AD causes the formation of senile plaques, consisting primarily of amyloid-beta peptides. The crucial role in this process at it's pre-clinical stage is likely imparted by peptide-membrane interactions, which now have been investigated in great structural detail.

We would like to thank all authors that contributed to Volume 31; that is, we are grateful to Julia Genova, Hemant K. Kashyap, Katia Cosentino, Carlos Alvarez, Norbert Kučerka and all their co-authors. We also like to

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