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Preface

Protein-mediated charge transport is of relevant importance in the design of protein-based electronics and in attaining an adequate level of understanding of protein functioning. This is particularly true for the case of transmembrane proteins, like those pertaining to the G protein–coupled receptors (GPCRs), which are involved in a broad range of biological processes, and a large number of clinically used drugs that elicit their biological effects via a GPCR.

This book aims to review a variety of experiments devoted to the investigation of charge transport in proteins and presents a unified theoretical model to interpret macroscopic results in terms of the amino acids backbone structure of the single protein. The book should serve a broad audience of researchers involved in the field of electrical characterization of biological materials and in the development of new molecular devices based on proteins, such as nanometric biological sensors of new generation. The book should also serve as a reference platform that surveys existing data and provides the basis for the future development of a new branch of nanoelectronics, which by mixing proteomics—that is, the large-scale study of proteins, particularly their structures and functions—and electronics is introduced here as *proteotronics*. The main objective of proteotronics is to propose and achieve innovative electronic devices, based on the selective action of specific proteins.

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