

Preface

The purpose of this SpringerBriefs volume is to provide an overview of the functional roles of multiheme cytochromes and to describe the recent progresses in their structural and functional characterization. It starts by revisiting the diversity of cytochromes, providing details on their main features and biogenesis. The chemistry of cytochromes is extremely heterogeneous, which reflects their different amino acid composition, sequence and tertiary arrangement around the heme groups. Such functional heterogeneity is even more striking in the case of multiheme cytochromes, in which the presence of several heme groups favors the efficient conversion of a substrate, extends the protein's functional redox potential range, allows the cooperative transfer of electrons, enhances the bacterial electron-storage capacity and the electron transfer through large distances without the need for successive binding events. Multiheme cytochromes are abundant in dissimilatory metal reducing bacteria, particularly in the *Shewanella* and *Geobacter* genera. These microorganisms can couple the oxidation of cytoplasmic compounds to the reduction of extracellular electron acceptors, a process currently explored in different biotechnological applications. Multiheme cytochromes are key players in these extracellular electron transfer pathways and representative members from *Shewanella* and *Geobacter* spp. are selected to illustrate how these proteins can be functionally and structurally characterized. Given the emergent multiheme cytochromes-biotechnological based applications we hope that this SpringerBriefs will stimulate specialists in fields such as molecular dynamics, protein structure and bioenergetics to provide more detailed contributions on the characterization of these proteins and assist on the elucidation of the bacterial extracellular electron transfer mechanisms.

Caparica, Portugal

Carlos A. Salgueiro
Joana M. Dantas

Multiheme Cytochromes

Salgueiro, C.A.; Dantas, J.M.

2016, XVI, 39 p. 12 illus., 8 illus. in color., Softcover

ISBN: 978-3-642-44960-4