Preface

Electron/proton coupling in biological energy transduction

Professor Antonio V. Xavier belongs to those rare colleagues in science that combine unusually warm human character with exceptional intellectual gifts. My recollections of him go back to the early seventies of the previous century when both of us were making our early independent steps in the same interdisciplinary research area of bio- and inorganic chemistry, a field that has matured and attracted a large number of colleagues, some contributing to this special issue. Looking back to those earlier days, it is not surprising that the person with whom Antonio has started his research career in Oxford, Prof. R.J.P. Williams had provided great inspiration to so many, including to my own early work, already as a graduate student at the Weizmann Institute of Science. The rather creative and imaginative ideas one encountered in Bob Williams reviews and books attracted, I guess, a whole generation to the interface of biological and inorganic chemistry and also shaped Antonio’s future: the select group of transition metal ions which evolution has employed for performing a wide and diverse range of functions, primarily in biological energy conversion processes, has been in the centerfield of Antonio’s interests, aiming at resolving structural and quantitative aspects of their function at as high a level as possible.

In pursuing this, he has also been one of the pioneers of employing the powerful method of nuclear magnetic resonance to studies of biochemical problems, from a conformational analysis of mononucleotides in solution, to ever increasing complex challenges such as structural properties of heme and iron-sulfur clusters containing proteins.

One particular interest of Antonio’s has been understanding the structural basis of cooperativity in electron–proton transfer processes and its role in energy transduction mechanisms. Here, his and mine interests overlapped and this yielded most pleasant long joint discussions.

Antonio was also determined to advance scientific research and teaching in Portugal. This task got him involved in establishing new research and teaching centers. Another one has been promoting contacts between the Portuguese community and the international one. For example, in the mid-eighties, he has organized a FEBS meeting on Metals in biology in the Algarve, an event that boosted both the field itself as well as the involvement of the younger Portuguese scientists in it. He has been a very active member of the FEBS where he served as a member of its Advanced Courses Committee (1985–88) and Publications Committee (2002–04), again manifesting his commitment to the advancement of molecular life sciences in Europe.

In this issue, contributions covering research of topics that were close to Antonio’s interests have been brought together by his disciple and friend, Miguel Teixeira, and his former Ph.D. student and coworker Ricardo Louro. These range from experimental and theoretical studies of heme containing and other enzymes and proteins, their mode of action and structural aspects, all the way to electrochemical studies of single molecules. A volume which Antonio would have certainly appreciated and enjoyed.

I do hope that before and above all, we shall have Antonio in our memory as a sensitive and warm friend. May this special volume dedicated to him be a small token of our feelings and thoughts of his unique personality.

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