PREFACE

Oxygen-binding proteins are arguably the most intensively studied of all proteins. The field has been revolutionised in recent years by paradigm shifts in our understanding of these proteins. Among these developments are (i) the discovery of globins in numerous animal species, plants and microbes, with important implications for globin evolution, (ii) the recognition that the ligand binding and catalytic capabilities of 'oxygen-binding proteins' actually embrace physiologically critical ligands such as nitric oxide and hydrogen sulphide, (iii) the sheer number of globins and haem proteins encoded by 'simple' genomes and (iv) the multiple roles of oxygen-binding proteins in natural environments and disease. The subject has considerable potential for contributing to knowledge that can be applied to the development of agriculture and medicine and to understanding the impacts of human activity on living organisms and ecosystems.

Conferences on O_2-binding proteins have long been held every two years across Europe. The meeting held in Parma (Italy, 2012) generated a volume of *Advances in Microbial Physiology* (Volume 63) in which the focus was on microbial globins and their diverse functions, where these are known. The following meeting was held in Sheffield (UK, 2014) and it is that highly successful conference that has generated this volume. Again, microbial globins are well represented, but the scope is here broader, encompassing *c*-type cytochromes, the impacts of oxygen levels in biology and biofilms.

These meetings and volumes demonstrate a remarkably multidisciplinary approach to the area, with contributions extending from molecular biophysics, to biochemistry and physiology and whole organism functions. Arguably, some of these contributions appear not to be 'physiology' in a classical sense but all provide critical new information on O_2-binding proteins that will ultimately provide information on how these proteins and the organisms *work*—the real goal of physiology.