

PREFACE

The chemistry, biochemistry and microbiology of several small bioactive gases have been covered several times in recent volumes of *Advances in Microbial Physiology*, especially oxygen, nitric oxide (NO) and carbon monoxide (CO) in the chapters, for example, by Sousa et al., Forte et al., Walker et al. and Southam et al. in Volume 71 and Bacon et al. in Volume 70. However, nitric oxide (NO) maintains a special place in this family of small signalling molecules, being the first to be called a 'gasotransmitter' (Wang, 2004). NO is one of several small molecules, formally known primarily as toxic gases, that have been shown to be endogenously generated, membrane-permeable and potent signalling molecules. The biological signalling activities associated with NO, CO, and hydrogen sulphide and their derived species have become topics of great interest to chemists, molecular biologists, clinicians and certainly microbiologists. Although these molecules have been termed 'gasotransmitters', the term is misleading, since all these species are completely soluble at concentrations of physiological relevance and therefore cannot be considered as gases in these biological contexts (Fukuto et al., 2012). Nevertheless, these small molecule signalling agents constitute complex and critical signalling webs that affect numerous physiological processes in animals, plants and microbes. This volume focuses on NO and its diverse roles and synthesis in yeast and bacteria, in pathogenesis and numerous aspects of bacterial physiology. Furthermore, because NO is generally toxic to bacteria, aspects of NO detoxification are covered. The impact of sulphides is covered in an opening comprehensive review of persulphides in microbiology and their importance as antioxidants and signalling agents.

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