Cell Death and Differentiation (1997) 4, 259

Book Review

NO between life and death

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The Biology of Nitric Oxide: Part 5. Proceeding of the 4th International Meeting on the Biology of Nitric Oxide, Amelia Island, Florida, 17–21 September 1995. Eds. S. Moncada, J. Stamler, S. Gross, E.A. Higgs. *Portland Press: 1996. Pp. 384. £100.00/US$160.00*

Among the molecules involved in signal-transduction nitric oxide (NO) has become quite a unique case. The signalling systems involving NO-mediated reactions seem to utilise a relatively common biochemical trigger (i.e. the S-nitrosylation or nitration of proteins). Yet this mechanism is responsible for the regulation of an impressive number of normal and abnormal functions in a variety of biological organisms. As neurotransmitter, NO regulates intestinal peristalsis, autonomic and neuroendocrine functions, and it plays a role in regulation of behaviour. On the other hand, production of NO downstream to the overstimulation of glutamate receptors has been implicated in excitotoxic neuronal injury. The latter may be causally involved in the pathogenesis of neurological disorders such as brain ischemia, Alzheimer's and Parkinson's diseases. The effects of NO on the vascular tissue were recognised at a very early stage and the role of NO and its congeners as vasodilators is well established. Meanwhile, it has become clear that NO may play important roles in spermatogenesis, in the pathogenesis of some viral infections in liver injury and as plant growth regulator. Neuronal differentiation and in general cell growth are also affected by NO, which can also elicit or prevent apoptosis in a variety of *in vitro* systems.

Nitric oxide is formed from the amino acid arginine by the NO synthase (NOS) with generation of citrulline. Four different NOS forms have been cloned and characterized. The endothelial NOS produces NO in blood vessels, which ensues in vasodilatation. Inducible NOS found in different cell types (i.e. macrophages, pancreas, glia) is induced by cytokines and other inflammatory stimuli and it is implicated in some of the pathological functions of NO. A separate form of inducible NOS has been cloned from the liver. Finally, neuronal NOS is a Ca^{2+}-calmodulin-dependent enzyme implicated in Ca^{2+}-mediated generation of NO in brain.

The ubiquitous and diverse roles of NO in biology have therefore attracted growing interest over the past few years. The Biology of Nitric Oxide, is the last of a series of books published by Portland Press that focuses on the biological roles of nitric oxide. It comprises the presentations of the fourth international meeting on Nitric Oxide which was held at Amelia Island, Florida, USA in September 1995. The book includes contributions from over 1350 scientists, ranging from the role of nitric oxide in cancer to the increasing number of physiological functions where NO plays a relevant regulatory role. This impressive number of high quality presentation provides an overview of the current knowledge of this molecule and its congeners. The book does not attempt to be a compilation of brief reviews, but it offers a comprehensive summary of some of the most recent findings. The articles are very informative since they are structured as individual short scientific articles including methodologies, figures and essential reference lists. For the researcher actively involved in this field, this volume is a must, a compilation of the state of the art. For the newcomer it is an equally powerful tool to understand the complexity and the multiform roles of NO in biomedicine.