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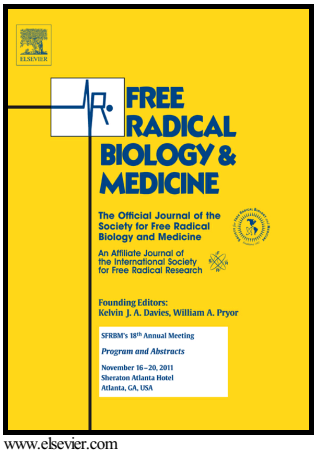

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More to NAD^+ than meets the eye: a regulator of metabolic pools and gene expression in Arabidopsis[1]

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Abstract

Since its discovery more than a century ago, nicotinamide adenine dinucleotide (NAD^+) is recognised as a fascinating cornerstone of cellular metabolism. This ubiquitous energy cofactor plays vital roles in metabolic pathways and regulatory processes, a fact emphasised by the essentiality of a balanced NAD^+ metabolism for normal plant growth and development. Research on the role of NAD in plants has been predominantly carried out in the model plant *Arabidopsis thaliana* (Arabidopsis) with emphasis on the redox properties and cellular signalling functions of the metabolite. This review examines the current state of knowledge concerning how NAD can regulate both metabolic pools and gene expression in Arabidopsis. Particular focus is placed on recent studies highlighting the complexity of metabolic regulations involving NAD, more particularly in the mitochondrial compartment, and of signalling roles with respect to interactions with environmental fluctuations most specifically those involving plant immunity.

Keywords pyridine nucleotides, NAD^+, redox, metabolic regulation, cellular signalling, plant immunity, mitochondrial function

[1] Special Issue entitled 'Redox Signaling in Plants and Implications for Mammalian Physiology'