

Editorial note

Highlight Section on “Polyphenols and Health”

This highlight section presents aspects of polyphenol research emanating from work presented at the Second International Conference on Polyphenols and Health held at the University of California at Davis on October 4–7, 2005, organized by Andrew L. Waterhouse, Cesar G. Fraga, Alyson Mitchell and Augustin Scalbert. Polyphenol research themes have shifted from free radical scavenging and metal chelating properties of polyphenols to exploration of specific polyphenol interactions with biomolecules affecting cell membrane properties, signaling, as well as polyphenol-induced changes in gene and protein expression. In addition and of importance for assessing biological mechanisms, there are studies on metabolism and bioavailability of polyphenols.

A first group of articles focuses on basic relationships that exist between absorption, metabolism and biological activity of polyphenols. Prior and Wu review the literature on the metabolism and structural characteristics of anthocyanins that could explain their biological activities. Donovan et al. present data indicating that the (–)-catechin enantiomer present in chocolate is absorbed to a lesser extent than its (+) antipode that occurs naturally in most plants and other foods. Crozier et al. present current knowledge on rutin metabolism and Shirai et al. demonstrate that one of the

main quercetin metabolites in human plasma, quercetin-3-glucuronide, diminishes formation of reactive oxygen species in cultured pheochromocytoma PC-12 nerve cells.

A second group of papers is concerned with the potential participation of polyphenols in disease. Perez-Vizcaino et al. review protective cardiovascular effects of quercetin and wine polyphenols. The article by Das et al. focuses on the action of resveratrol on cardiac function associated to the capacity of this polyphenol to inhibit specific cell signaling pathways and regulate heme oxygenase-1. Steffen et al. present evidence for a possible mechanism to explain the cardioprotective and vascular effects of catechins, by showing the action of (–)-epicatechin preventing myeloperoxidase-mediated LDL-oxidation. Mackenzie et al. describe how (–)-epicatechin can modulate NF- κ B in Hodgkin's lymphoma cell lines and Mukhtar et al. discuss effects of polyphenols from green tea and pomegranate on prostate cancer cells. Finally, Maher describes how flavonoids can mimic some of the properties of neurotrophic factors, making a link to neurodegenerative diseases.

The help of Drs Jennifer L Donovan and Cesar G. Fraga in getting this Highlight Section together is greatly appreciated.