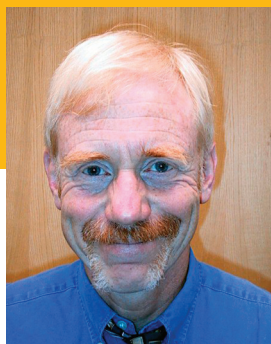


Editorial



New perspectives on dietary polyphenols: Taking stock, more to come

Polyphenols are arguably the most intensely researched group of nutritional phytochemicals alleged to exert beneficial effects on human health. Reflecting the ubiquitous interest of the nutritional research community in polyphenols, this journal has in the past 2 years devoted several issues to specific aspects of polyphenols. The current special issue is different in that it provides a wide-ranging perspective of the breadth and depth of current research on polyphenols, rather than focussing on individual agents or specific health features.

Novel mechanisms, which might explain health effects, are a prime topic in polyphenol research. Several papers in this issue discuss mechanisms. Phenolic acids prevented oxidative stress and increased levels of IL-1 β caused by high glucose in monocyte cultures *via* modulation of the protein kinase C/NF κ B axis (Wu *et al.*). Isolated flavones and extracts of bearberry and green olive leaves inhibited production of nitric oxide and TNF- α induced by “advanced glycation endproducts,” molecules germane to the pathology of neuro-inflammatory diseases (Chandler *et al.*). Green and black tea polyphenols interfered with IL-6 generation induced by the tumour necrosis factor superfamily 14 in gingival fibroblasts (Hosokawa *et al.*). Black current proanthocyanidins and epigallocatechin suppressed IL-4-stimulated CCL26 excretion in human alveolar epithelial cells, and thus may alleviate airway inflammation (Hurst *et al.*). Polyphenols in wine fractions capable of activating

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endothelial cell nitric oxide synthase were characterized (Auger *et al.*).

Antineoplastic properties of polyphenolic phytochemicals are a popular research subject, and two papers in this issue deal with this topic. Flavone suppressed the development of colorectal microadenomas in mice exposed to the carcinogen *N,N*-dimethylhydrazine *via* downregulation of the activity of the tricarboxylic acid cycle (Winkelmann *et al.*). Resveratrol exerted anti-invasive properties in lung cancer cells *via* inhibiting expression of heme oxygenase 1 and matrix metalloproteinases 2 and 9 (Liu *et al.*).

Three contributions in this issue describe studies of xanthohumols, prenylated chalcones from hops, which possess a fascinating array of health effects. They decreased inflammation in a model of non-alcoholic steatohepatitis, a chronic liver disease (Dorn *et al.*), induced apoptosis in bone marrow dendritic cells important in the maintenance of immunity (Xuan *et al.*), and altered the expression of genes involved in thyroid hormone homeostasis in rats (Radović *et al.*).

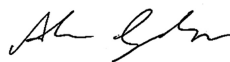
We know little about structure–biological activity relationships for polyphenols. Such knowledge is important to help prioritise agents for development as putative medicinal agents. Four papers in this issue elucidate such relationships. Polymethoxystilbene analogues of resveratrol displayed encouraging anti-angiogenic properties, hinting tentatively at their potential as

chemotherapeuticants (Basini *et al.*). 5-Hydroxylated polymethoxyflavones modulated cellular signalling molecules germane to proliferation and apoptosis more potently than their permethylated counterparts (Qiu *et al.*). Xiao *et al.* compared the serum albumin binding affinities of flavones harbouring different numbers of hydroxy moieties in the A ring. Quercetin, but not its glycoside rutin, increased accumulation of β -carotene, a carotenoid imparting potential health benefits, in the murine small intestine (Bando *et al.*).

Studies in healthy human volunteers constitute the experimental “gold standard” in food research. Three papers in this issue report on such trials. A manufactured polyphenol-enriched juice achieved agent bio-delivery as efficiently as that described previously for feeding studies using the individual components contained in their indigenous

dietary sources (Borges *et al.*). Green tea containing different amounts of polyphenols increased plasma reducing and antioxidant potentials in a dose-related fashion (Pecorari *et al.*). Hop prenylflavonoids have putative phytoestrogenic properties, but oestrogenic responses were not observed in breast tissue of women who had ingested hop supplements before undergoing aesthetic breast reduction (Bolca *et al.*). This special issue

fuels the suspicion that polyphenols will remain a fertile ground for exciting pharmaceutical and pharmacological discoveries for many years to come.



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