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Introduction to special issue on Polyphenols and Health

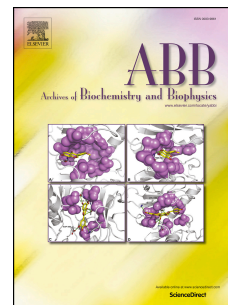
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Polyphenols and Health

Patricia I. Oteiza and Christian Heiss

The understanding of the beneficial effects of plant bioactives on human health is of critical interest considering the already observed and proven benefits for some of them, i.e. fiber and control of glycemia, stanols mitigating hypercholesterolemia. In the field of polyphenols, and as discussed in the introductory review [1], research has grown exponentially in the last 25 years, at a faster rate than for other bioactives. Although there is a significant lack of information on major aspects of the relevance of dietary polyphenols on human health, the field has advanced significantly. Thus, there is considerably more information on the absorption, distribution, metabolism, and excretion (ADME) of polyphenols in healthy humans [2]. In particular, it is important to consider that humans can have major differences in metabolizing capacity given individual differences in intestinal microbiota and in the genes involved in ADME [2, 3]. Characterization of polyphenol metabolism in different species (e.g. humans [2, 3] and rats [4]) is relevant for the evaluation of how the extensive experimental research originated in rodents can be extrapolated to the actions of individual polyphenols in humans.

Based on new understandings on polyphenol ADME, it is now accepted that studies *in vitro* (e.g. cell cultures) have to take into consideration which are the compounds (parent or metabolites) and concentrations that the studied tissue/cell would be exposed to after polyphenol oral ingestion and metabolism by the microbiota and tissues [5, 6]. Interestingly, availability of polyphenols for potential therapeutic use could be significantly increased in the future through extracellular vesicle delivery [7] and solid lipid nanoparticles [8].

One of the health benefits of polyphenols that has received most experimental support is the capacity of select families of compounds to modulate risk factors for cardiovascular disease, e.g. platelet

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