Synthetic Analogues of Flavonoids as Novel Prototypes of Food Supplements

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Abstract

Flavonoids are ubiquitous in fruits and vegetables and show many functional effects, resulting from their ability to modulate key molecular mechanisms related to cardiovascular diseases and some types of cancer. They are present in relatively high amounts in the diet of both European and American population and their intake is highly recommended for preventive health purposes.
However, despite endowed with intriguing activities, flavonoids possess significant drawbacks. Actually, their functional effects occur at high, non-physiological concentrations, seldom reached in the circulation, and a clear evidence of the relationship between flavonoids consumption and health benefits still lacks. Moreover, their low solubility and stability, coupled with unfavourable pharmacokinetics properties and the ability to modulate additional and unrelated molecular targets, limit their exploitability either as food supplements or even as drug candidates. Nevertheless, they represent an excellent and logical source of inspiration for medicinal chemists, who may design synthetic analogues to achieve safer and more effective compounds.
Prompted by these considerations, we developed a number of synthetic analogues of flavonoids, to obtain novel anti-oxidant, anti-inflammatory compounds as viable agents exploitable in the management of vascular dysfunctions. When tested at a concentration fully consistent with their use in vivo, our derivatives turned out to be more effective than well known flavonoids in modulating platelet reactivity and regulating key inflammatory events involved in the remodelling of vessel walls. Accordingly, they may represent novel prototypes of food supplements, exploitable to enrich the efficacy of natural flavonoids compounds.

Biography:

Concettina La Motta, PhD, works as Associate Professor of Medicinal Chemistry at the Department of Pharmacy of the University of Pisa, Italy. Her main research interests focus on the design, synthesis and functional validation of novel heterocyclic compounds developed as drug candidates for the treatment of inflammation, tumour and long term diabetic complications.