Dietary polyphenols represent a wide family of compounds and several of them (isoflavones, catechins, procyanidins and quercetin) have significant health benefits on cancer, neurological disorders, metabolic and cardiovascular diseases. However, the clinical use of natural polyphenols is unresolved because of their poor selectivity, low bioavailability and physiological instability which hinders their value for therapeutic applications. Thus: i) synthetic structurally-related polyphenolic compounds (e.g. synthetic prodrugs of (−)-epigallocatechin-3-gallate or EGCG) have emerged as novel more effective drugs and, ii) development of new delivery systems are showed as an advantage to overcome the limitations such as instability, toxicity or bioavailability. The aim of this special issue is reviewing the last preclinical and clinical findings in the use of natural and synthetic polyphenolic compounds as emerging drugs for cancer treatment and prevention, neurodegenerative and metabolic disorders and for reducing neuropathic pain, focused on the potential new molecular targets and cell signaling pathways involved.

Keywords:
Polyphenols; synthetic analogs; drug delivery systems; molecular targets; nanobiotechnology; cancer treatment; cancer prevention; neuropathic pain; neurological disorders; toxicity profile

Subtopics:
Polyphenols and their synthetic analogs as emerging anticancer agents
Dietary polyphenols with chemopreventive potential
Catechins for prevention and treatment of neurodegenerative disorders
New pharmacological approaches using polyphenols on the physiopathology of neuropathic pain
Design of polyphenol-nanodelivery systems for improving drug stability and bioavailability
Developmental toxicity of polyphenolic compounds

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