Flavonoid: A Natural Scaffold with Modulatory Activities on Diverse Cellular Signaling Pathways Related to Complex Diseases

Flavonoids are a group of compounds with a polyphenolic scaffold, commonly found in fruit, vegetables, grains, bark, roots, stems, flowers, tea, and wine. More than 50 years ago, a flavonoid was isolated from oranges. Initially, it was called vitamin P, but later, it was realized as rutin, a compound from the flavonoid class. After that, we have witnessed a major breakthrough in the research on flavonoids, and on their health and beneficial effects. To date, more than 8000 varieties of flavonoids have been identified. Initially, the beneficial health effects of flavonoids were ascribed to their antioxidant properties. Later, many health-beneficial roles have been identified. Flavonoids have been shown to elicit neuroprotective, anticancer, anti-allergic, anti-inflammatory, anti-microbial, and many more activities. The clear role of flavonoids in the prevention of cardiovascular diseases has been evident from epidemiological studies. The potential of flavonoids to improve memory, learning, and general cognitive ability has also been shown. Apart from the clinical effects, flavonoids are now shown to interact with various intracellular components and elicit modulatory activities on various cellular signaling cascades. Various inhibitory or stimulatory actions of flavonoids on these pathways greatly affect cellular functions by altering the state of targeted molecules. Flavonoids also modulate various gene expressions through the activation of various transcription factors. Cell signaling is a critically important mechanism in multi-cellular organisms. In the recent past, the role of various flavonoids in the modulation of signaling pathways involved in disease pathogenesis has been explored. Thus, there is a newly emerging view to cure complex diseases by modulating the intracellular signaling pathways by the use of various natural compounds. The present issue will focus on the effect of flavonoids on various cellular pathways, particularly the pathways involved in complex diseases, like neurodegenerative diseases, cancer, and many more, to understand the molecular action of flavonoids, which may pave the way for future drug discovery using flavonoid scaffold [1-4].

REFERENCES


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