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Multitargeting By Turmeric, The Golden Spice: From Kitchen to Clinic

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Abstract

Although much has been published about curcumin, which is obtained from turmeric, comparatively little is known about turmeric itself. Turmeric, a golden spice obtained from the rhizome of the plant *Curcuma longa*, has been used to give color and taste to food preparations since ancient times. Traditionally, this spice has been used in Ayurveda and folk medicine for the treatment of such ailments as gynecological problems, gastric problems, hepatic disorders, infectious diseases, and blood disorders. Modern science has provided the scientific basis for the use of turmeric against such disorders. Various chemical constituents have been isolated from this spice, including polyphenols, sesquiterpenes, diterpenes, triterpenoids, sterols, and alkaloids. Curcumin, which constitutes 2–5% of turmeric, is perhaps the most-studied component. Although some of the activities of turmeric can be mimicked by curcumin, other activities are curcumin-independent. Cell-based studies have demonstrated the potential of turmeric as an antimicrobial, insecticidal, larvicidal, antimutagenic, radioprotector, and anticancer agent. Numerous animal studies have shown the potential of this spice against proinflammatory diseases, cancer, neurodegenerative diseases, depression, diabetes, obesity, and atherosclerosis. At the molecular level, this spice has been shown to modulate numerous cell-signaling pathways. In clinical trials, turmeric has shown efficacy against numerous human ailments including lupus nephritis, cancer, diabetes, irritable bowel syndrome, acne, and fibrosis. Thus, a spice originally common in the kitchen is now exhibiting activities in the clinic. In this review, we discuss the chemical constituents of turmeric, its biological activities, its molecular targets, and its potential in the clinic.