

Title: Targeted therapies of curcumin focus on its therapeutic benefits in cancers and human health: Molecular signaling pathway-based approaches and future perspectives

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Abstract: The curry powder spices turmeric (*Curcuma longa* L.), which contains [curcumin](#) (diferuloylmethane), an orange-yellow chemical. Polyphenols are the most commonly used sources of curcumin. It combats [oxidative stress](#) and inflammation in diseases, such as [hyperlipidemia](#), [metabolic syndrome](#), arthritis, and depression. Most of these benefits are due to their anti-inflammatory and antioxidant properties. Curcumin consumption leads to decreased bioavailability, resulting in limited absorption, quick metabolism, and quick excretion, which hinders health improvement. Numerous factors can increase its bioavailability. [Piperine](#) enhances bioavailability when combined with curcumin in a complex. When combined with other enhancing agents, curcumin has a wide spectrum of health benefits. This review evaluates the therapeutic potential of curcumin with a specific emphasis on its approach based on molecular [signaling pathways](#). This study investigated its influence on the progression of cancer, inflammation, and many health-related mechanisms, such as [cell proliferation](#), apoptosis, and metastasis. Curcumin has a significant potential for the prevention and treatment of various diseases. Curcumin modulates several biochemical pathways and targets involved in cancer growth. Despite its limited [tissue accumulation](#) and bioavailability when administered orally, curcumin has proven useful. This review provides an in-depth analysis of curcumin's therapeutic applications, its molecular signaling pathway-based approach, and its potential for precision medicine in cancer and human health.

Keywords: Curcumin Turmeric (*Curcuma longa*) Bioavailability Piperine Polyphenols Antioxidant activity

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