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## Curcumin as a natural regulator of monocyte chemoattractant protein-1.

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#### Abstract

Monocyte chemoattractant/chemotactic protein-1 (MCP-1), a member of the CC chemokine family, is one of the key chemokines that regulate migration and tissue infiltration of monocytes/macrophages. Its role in the pathophysiology of several inflammatory diseases has been widely recognized, thus making MCP-1 a possible target for anti-inflammatory treatments. Curcumin (diferuloylmethane) is a natural polyphenol derived from the rhizomes of *Curcuma Longa* L. (turmeric). Anti-inflammatory action underlies numerous pharmacological effects of curcumin in the control and prevention of several diseases. The purpose of this review is to evaluate the effects of curcumin on the regulation of MCP-1 as a key mediator of chemotaxis and inflammation, and the biological consequences thereof. In vitro studies have shown that curcumin can decrease MCP-1 production in various cell lines. Animal studies have also revealed that curcumin can attenuate MCP-1 expression and improve a range of inflammatory diseases through multiple molecular targets and mechanisms of action. There is limited data from human clinical trials showing the decreasing effect of curcumin on MCP-1 concentrations and improvement of the course of inflammatory diseases. Most of the in vitro and animal studies confirm that curcumin exert its MCP-1-lowering and anti-inflammatory effects by down-regulating the mitogen-activated protein kinase (MAPK) and NF- $\kappa$ B signaling pathway. As yet, there is limited data from human clinical trials showing the effect of curcumin on MCP-1 levels and improvement of the course of inflammatory diseases. More evidence, especially from human studies, is needed to better assess the effects of curcumin on circulating MCP-1 in different human diseases and the role of this modulatory effect in the putative anti-inflammatory properties of curcumin.

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**KEYWORDS:** Curcuma longa; Curcumin; Inflammation; MCP-1

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