

# Curcumin modulates the immune response associated with LPS-induced periodontal disease in rats.

[Guimarães MR](#), [de Aquino SG](#), [Coimbra LS](#), [Spolidorio LC](#), [Kirkwood KL](#), [Rossa C Jr.](#)

Department of Diagnosis and Surgery, Faculdade de Odontologia de Araraquara, Univ Estadual Paulista (UNESP), Araraquara, SP, Brazil.

## Abstract

Curcumin is a plant-derived dietary spice ascribed various biological activities. Curcumin therapeutic applications have been studied in a variety of conditions, but not on periodontal disease. Periodontal disease is a chronic inflammatory condition initiated by an immune response to micro-organisms of the dental biofilm. Experimental periodontal disease was induced in rats by injecting LPS in the gingival tissues on the palatal aspect of upper first molars (30  $\mu$ g LPS, 3 times/week for 2 weeks). Curcumin was administered to rats daily via oral gavage at 30 and 100 mg/kg body weight. Reverse transcriptase-qPCR and ELISA were used to determine the expression of IL-6, TNF- $\alpha$  and prostaglandin E(2) synthase on the gingival tissues. The inflammatory status was evaluated by stereometric and descriptive analysis on hematoxylin/eosin-stained sections, whereas modulation of p38 MAPK and NF- $\kappa$ B signaling was assessed by Western blot. Curcumin effectively inhibited cytokine gene expression at mRNA and protein levels, but NF- $\kappa$ B was inhibited only with the lower dose of curcumin, whereas p38 MAPK activation was not affected. Curcumin produced a significant reduction on the inflammatory infiltrate and increased collagen content and fibroblastic cell numbers. Curcumin potently inhibits innate immune responses associated with periodontal disease, suggesting a therapeutic potential in this chronic inflammatory condition.

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