

**Resolvin E1 regulates inflammation at the cellular and tissue level and restores tissue homeostasis in vivo.**

[Hasturk H](#), [Kantarci A](#), [Goguet-Surmenian E](#), [Blackwood A](#), [Andry C](#), [Serhan CN](#), [Van Dyke TE](#).

Goldman School of Dental Medicine, Department of Periodontology and Oral Biology, Boston University, Boston, MA 02118, USA.

Resolvin E1 (RvE1) is a potent proresolving mediator of inflammation derived from omega-3 eicosapentaenoic acid that acts locally to stop leukocyte recruitment and promote resolution. RvE1 displays potent counter-regulatory and tissue-protective actions in vitro and in vivo. Periodontal disease is a local inflammatory disease initiated by bacteria characterized by neutrophil-mediated tissue injury followed by development of a chronic immune lesion. In this study, we report the treatment of established periodontitis using RvE1 as a monotherapy in rabbits compared with structurally related lipids PGE(2) and leukotriene B(4). PGE(2) and leukotriene B(4) each enhanced development of periodontitis and worsened the severity of disease. Promotion of resolution of inflammation as a therapeutic target with RvE1 resulted in complete restoration of the local lesion, and reduction in the systemic inflammatory markers C-reactive protein and IL-1beta. This report is the first to show that resolution of inflammation by a naturally occurring endogenous lipid mediator results in complete regeneration of pathologically lost tissues, including bone.

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