

AAO Foundation Award Final Report

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Award Type	Biomedical Research
Project Title	Localization of Nitric Oxide Synthase in the Periodontal Tissues of Orthodontically Moved and Stationary Teeth
Project Year	1999
Institution	Temple University
Summary/Abstract	<p>The literature supports the notion that the inflammatory response and vascular supply of the periodontal tissues is crucial to mediating the effects of applied force. Nitric oxide (NO), a molecule only recently recognized as a chemical messenger within biologic systems, has been shown to be central to these processes. These recent advances in our knowledge of nitric oxide and its widespread effects throughout the body beg the question of this molecule's involvement in orthodontic tissue remodeling. Therefore, the aim of this investigation was to identify the sites of endothelial nitric oxide synthase (eNOS) and inducible nitric oxide synthase (iNOS) activity in the periodontal tissues of moved and stationary teeth using immunohistochemistry. Our data show that the periodontal tissues of stationary rat molar teeth exhibit the presence of less eNOS and iNOS. There is increased amounts of eNOS produced after rat molar tooth movement in blood vessel walls. There is increased amounts of iNOS produced after rat molar tooth movement in the periodontal ligament and connective tissue between roots of moved teeth as well as around blood vessels. The presence of eNOS and iNOS was consistently seen in the odontoblast layer of pulp chambers of moved and stationary teeth. Our results indicate a possible role of NO in the periodontal remodeling during tooth movement.</p>