

Slots J. The predominant cultivable microflora of advanced periodontitis.

Scand. J. Dent. Res. 85:114-21, 1977.

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This study delineated the most important pathogens in adult periodontitis. Major periodontal pathogens were various gram-negative anaerobic rods. The data showed that periodontal pathogens constitute a relatively small number of species among the more than 400 different bacteria populating periodontal lesions. The concept of bacterial specificity in periodontitis points to treatment strategies that focus on the suppression or elimination of selected periodontal pathogens. [The SCI® indicates that this paper has been cited in more than 235 publications.]

Microflora of Periodontitis

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Periodontitis is a group of infectious diseases that affect the supporting structures of the teeth. Periodontitis is the leading cause of tooth loss in most adult populations throughout the world.

The disease process involving solely the gum tissue is termed *gingivitis*. Once the disease extends to include the destruction of tooth supporting collagen fibers and tooth-associated bone, the designation becomes *periodontitis*. Gingivitis constitutes a reversible lesion, whereas periodontitis most often results in permanent damage of the tooth/dentition.

In the mid-1970s, it became clear that a relatively small number of bacteria gave rise to most forms of destructive periodontal disease. The present article was the first publication to incriminate certain anaerobic species in the etiology and pathogenesis of periodontitis in adults. Of all cultivable bacteria from deep periodontal lesions, 90 percent were obligate anaerobes and 75 percent gram-negative organisms. In contrast, the microflora in periodontal health consists mainly of facultative (75 percent) and gram-positive (85 percent) organisms. Black-pigmented bacteroides organisms belonging to the species *Bacteroides gingivalis* (new nomenclature: *Porphyromonas gingivalis*) and

Bacteroides intermedius (new nomenclature: *Prevotella intermedia*) predominated in most adult periodontitis lesions. Other organisms that were numerically important were *Fusobacterium nucleatum*, various nonpigmented bacteroides species, and a motile organism, later classified as *Wollnella recta*. The key to delineating the pathogenic microflora in periodontitis was improved anaerobic culture techniques and media, significant progress in bacterial taxonomy, and greater understanding of the clinical aspects of periodontal disease.

Scientifically, this and other studies from the 1970s formed the basis for literally hundreds of research projects on the virulence factors of the specific periodontal pathogens, means of eradicating the organisms from existing lesions, and even vaccination approaches to prevent oral establishment of the organisms.¹⁻³ Today, laboratories in North America, Europe, and Asia are intensively studying black-pigmented organisms by means of molecular biological techniques in an attempt to understand the molecular basis for conversion of a gingivitis lesion to a periodontitis lesion.

Clinically, the concept of bacterial specificity in periodontitis already has led to important improvements in periodontal diagnosis and treatment. In 1983 in Sweden and in 1985 in the US, I established microbiological reference laboratories to help dentists identifying periodontal pathogens and appropriate antimicrobial therapy in individual patients. Similar laboratories have been developed in several places in the US, Canada, Norway, Finland, and Holland. The utilization of DNA probes and monoclonal antibody reagents specific for selected periodontal pathogens has allowed shipment of specimens from all over the world to these laboratories. The latest development in periodontal diagnostics is a chair-side kit of DNA probes capable of detecting several periodontal pathogens in 30 minutes.

In the future, periodontitis will be managed as a transmissible infectious disease. The emphasis on the infectious aspects of periodontitis is already apparent in the curriculum of many dental schools.

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2. Slots J & Listgarten M A. *Bacteroides gingivalis*, *Bacteroides intermedius* and *Actinobacillus actinomycetemcomitans* in human periodontal diseases. *J. Clin. Periodontol.* 15:85-93, 1988.
3. Slots J & Rams T E. Antibiotics in periodontal therapy: advantages and disadvantages. *J. Clin. Periodontol.* 17:479-93, 1990.

Received March 15, 1991