



## **ANTIBACTERIAL EFFECTS OF A BIOACTIVE GLASS PASTE ON ORAL MICROORGANISMS.**

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Bioactive glasses contain oxides of calcium, sodium, phosphorus, and silicon in a proportion that provides the material with surface activity and concomitantly with the property of forming a strong bond with bone. Bioactive glasses have been tested as bone substitutes in different clinical situations. In an aqueous environment,  $\text{Ca}^{2+}$ ,  $\text{Na}^+$ ,  $\text{PO}_4^{3-}$ , and  $\text{Si}^{4+}$  are released from the glass, resulting in a rise in pH and in osmotic pressure in its vicinity. Since these are factors that potentially influence the viability of oral microorganisms at the dentogingival margin, we studied the effects of bioactive glass S53P4 on the oral microorganisms *Actinobacillus actinomycetemcomitans*, *Porphyromonas gingivalis*, *Actinomyces naeslundii*, *Streptococcus mutans*, and *Streptococcus sanguis*. This was done by incubating each microbe in a suspension, in the presence of bioactive glass S53P4 in powder form. *A. naeslundii* was found to lose its viability within 10 min under the experimental conditions. *A. actinomycetemcomitans*, *P. gingivalis*, and *S. mutans* lost their viability within 60 min. Also for *S. sanguis* a significant loss of viability was seen within 60 min, but it was the only microbe that had any viable cells left after 60 min. Thus, in aqueous solutions the powdered bioactive glass S53P4 appears to have a broad antimicrobial effect on microorganisms of both supra- and subgingival plaque. Consequently, it could be useful as an ingredient in tooth-care products that may have beneficial effects on oral health both from a cariologic and a periodontal point of view.

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