

# Bioactive Glasses for Dental Applications

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Bioactive glasses were invented by Larry Hench. These glasses degrade in body fluids releasing  $\text{Ca}^{2+}$ ,  $\text{PO}_4^{3-}$  ions and form an apatite like phase similar to bone and tooth mineral. They are used as bone substitutes, for treating periodontal disease and for re-mineralizing toothpastes such as Sensodyne® Repair and Protect for treating dentine hypersensitivity.

Composition-structure-property relationships in Bioactive Glasses will be briefly discussed with an emphasis on the importance of glass network connectivity. The role of phosphate, soda, magnesia, strontium oxide and halogens will be reviewed.

It will then be shown how this understanding can be used to design glasses for making: bone grafts, tissue engineered scaffolds, air abrasives, re-mineralizing hypersensitivity toothpastes and bioactive glass based dental composites.

A specific focus of the talk will be the development of BioMinF® toothpaste based on a fluoride containing bioactive glass launched by BioMin Technologies Ltd.