Biomaterials Journal
http://www.biomatj.com
Online ISSN: 2812-5045

Type of the Paper (Editorial)

Bioactivity of Dental Materials

Tamer M. Hamdy [1,*]

[1] Restorative and Dental Materials Department, Oral and Dental Research Institute, National Research Centre (NRC), Giza, Dokki, 12622, Egypt
* Corresponding author e-mail: dr_tamer_hamdy@yahoo.com

Citation: Tamer M. Hamdy.***Bioactivity of Dental Materials***. *Biomat. J., 2 (1),42 – 43 (2022).*

https://doi.org/10.5281/znodo.5829408

Received: 29 January 2023
Accepted: 30 January 2023
Published: 31 January 2023

Abstract: Bioactive dental materials not considered as a novel idea. Adhesion of dental materials into hard dental structure by an appetite-like deposition by help of fluoride releasing materials or by interaction of calcium phosphate-based materials considered as the first step for bioactivity. As there are materials have been widely used over many years that demonstrated numerous levels of bioactivity. These materials are used mostly for repair, reconstruction and regeneration of dental invectives. For example, glass ionomer has been described as bioactive material due to their capability to remineralization the demineralized tooth structure, furthermore to continuous dynamic release of fluoride ions which delay the secondary caries around the restoration margins.

Keywords: Bioactive, remineralization, bone formation, regeneration.

Bioactive dental materials not considered as a novel idea. Adhesion of dental materials into hard dental structure by an appetite-like deposition by help of fluoride releasing materials or by interaction of calcium phosphate-based materials considered as the first step for bioactivity. As there are materials have been widely used over many years that demonstrated numerous levels of bioactivity. These materials are used mostly for repair, reconstruction and regeneration of dental invectives.

For example, glass ionomer has been described as bioactive material due to their capability to remineralization the demineralized tooth structure, furthermore to continuous dynamic release of fluoride ions which delay the secondary caries around the restoration margins.

Moreover, calcium hydroxide, which have used for decades can be dissociated into calcium and hydroxyl ions, which in turn cause cascade of events that inspire deposition of reparative dentin and tooth remineralization. Therefore, these activities make glass ionomer and calcium hydroxide one of the firstly known bioactive dental materials. Bioactive dental materials could be defined as materials that form a layer of an appetite-like deposits at the tissue materials boundary upon exposure to inorganic phosphates solution.

Mechanisms of bioactivity includes a different step may occurs alone or together. A bioactive restorative material comprises at least one or more of the following behaviors; 1. Remineralization of the hard-dental tissues through fluoride and or other minerals release; 2. Apatite-like formation along the material tissue interface upon immersion in liquid; 3. Tissues repair and regeneration by encouraging the normal healing mechanism.

The level of evolution will comprise extended applications across all dental material categories, including permanent fillings, adhesives, dental and bone cements, bone grafts, substitute and scaffold, cavity liners and bases, endodontic sealers and pulp capping, preventive measures and patient home care. Bioactivity raises to a inimitable property of a material that provokes a cellular response, such as the formation of

hydroxyapatite. As compared to inert materials, bioactive materials are capable to produce growth factors and encourage natural mineralization. These responses has a large impact on the mechanically and esthetically results, thereby clinical durability of the bioactive material.