ACTA SCIENTIFIC DENTAL SCIENCES (ISSN: 2581-4893)

Volume 4 Issue 2 February 2020

Opinion

Dental Biomaterials- A Boon to Dentistry

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DOI: 10.31080/ASDS.2020.04.0770

Received: January 11, 2020

Published: January 28, 2020

These are natural and synthetic materials that are used to restore or replace the damaged dental tissue such as enamel, dentin, cementum, pulp, bone and other intraoral tissue. these include resin based restorative materials, ceramics, titanium implant, matrices, scaffolds, etc.,. These dental biomaterials should be safe and biocompatible to be used in patients. Scientists and research associate in the fields of clinical dentistry, molecular biology, stem cell biology, tissue engineering, proteomics, genomics, polymer chemistry, toxicology and metallurgy strive hard to create. Thorough knowledge, manipulation and various applications of the physical, chemical, mechanical and biocompatible properties of material is essential. The application of dental biomaterials has enormous benefits in multiple fields of dentistry. They are being used to enhance strategies in diagnosis, imaging and treatment. Research is being carried out on ceramics resin cement, zircon crowns, controlled drug delivery, titanium implant, regenerative dentistry. Regenerative dentistry focused on regeneration of enamel, dentin, pulp, cementum, alveolar bone and even the entire tooth using biomimetic materials such as stem cells, PRF, PRP, BETA TCP, scaffolds, matrices, collagen membranes. Novel biomaterials are being designed to promote regeneration of oral tissue. Research in operative dentistry includes usage of novel restorative materials and minimally invasive dentistry. Regenerative dentistry involves materials that promote ridge augmentation, bone growth, regrowth of pulp, periodontal ligament and creation of entire tooth using stem cells. Usage of stem cells and scaffolds with nanostructured materials helps in regeneration. Some of the recent advances in biomaterial include 1. Incorporating zwitterion into light cure fluoride varnish for biofilm inhibition and caries prevention.2. human bone marrow derived stem Cells seeded bone biomaterials for enhancing bone augmentation. 3. Coating titanium implant with biomimetic agents such as calcium ions, tricalcium phosphate to optimize osseointegration. Dental practice focuses on patient centered selection of biomaterials to enhance treatment outcome and patients satisfaction. There is a constant requirement for development of innovative, restorative, surgical and regenerative techniques. Recent advances in biomaterial dentistry improved treatment strategies and success of dental treatment.