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Science of biomaterials and surgical techniques for enhanced tissue regeneration in implant dentistry

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The use of dental implants for the rehabilitation of missing teeth provide optimal masticatory function and esthetics, improving self-esteem and overall quality of patient's life. The recent achievements in the fields of nanotechnology and biomaterial engineering gave new perspective on regeneration and therapeutic success in dental implantology. Modifications of implant design and materials at a nanoscale, along with delivery of biomaterials which could enhance osseointegration and bone regeneration, contribute greatly to implant treatment success. However, the therapeutic challenges associated with the patient with limited regenerative potential of the surronding tissue, due to systemic health problems such as immunological disorders or diabetes mellitus, require additional compounds and surgical procedures to achieve successful implant treatment. In that context, the aims are to point at biological aspects related to the beneficial regenerative properties of biomaterials used in bone grafting as well as of piezosurgery in healthy and in patients with diabetes mellitus. Evaluation of biologic characteristics aims to provide insight into proper and optimal use of biomaterials for long term successful implant treatment.

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