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Editorial

Nanomedicine: A New Era in Dentistry

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The introduction of the concept of nanotechnology into the field of biomaterials has improved the results of its use in regenerative treatments based on the principles of tissue engineering; due to its improvement of the physical properties of materials manufactured in this way; therefore, it has become possible to produce hydroxyapatite particles with nano-sized sizes.

The term nano refers to the sizes of materials at the level of one billionth of a meter, i.e. 10-9 m, as the sizes of nanomaterials range between (1-100) nanometers.

Nanoscience is defined as the science that studies the properties of materials with a nanoscale scale, and focuses on the unique properties - which depend on size - of solid materials.

Understanding these properties has opened new doors in science that were previously unexplored or incomprehensible, due to the lack of technologies to explore and deal with materials of these sizes. This has led to the emergence of new technologies known as nanotechnology, which is described as methods of dealing with and using materials with nanoscale sizes (at the level of 10-9 m). The use of nanomaterials has diversified to the point that it has reached most scientific fields, including physics, chemistry, materials science, engineering, biology, medicine, and other sciences.

Use of nanotechnology in the medical field: Disease prevention, diagnosis and treatment, Drug delivery, Regenerative medicine, Regenerative dentistry and others.

Nanomaterials have been used in various fields of dentistry and its specialties, as their many advantages have been utilized in regenerative dentistry, generating dental and periodontal tissues, manufacturing scaffolds to replace oral and maxillofacial structures, and manufacturing various restorative and oral health materials. Therefore, the application of nanomaterials in the field of tissue engineering has brought about significant development and changed many clinical applications.

Nanomaterials were first used in dentistry in 2002 as fillers in composites, in guided tissue regeneration and bone regeneration (GTR/GBR) in the context of periodontal diseases and other various uses.

Contemporary dentistry has turned to using engineering technologies and modern biomaterials in various fields; from manufacturing restorative materials and oral health materials to treating periodontal diseases and their regeneration, manufacturing dental prostheses, dental implants and oral tumors.

The entry of nanomaterials into the field of dentistry remains a milestone due to the great benefits that its entry has added to this field.