Editorial Article

Nanotechnology in Dentistry

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Received Date: January 27, 2021
Publication Date: February 01, 2021

Nanotechnology refers to manipulating structures that are measured up to several hundred nanometers in size. "Nano" is derived from the Greek word, meaning "dwarf".

With the recent technologies and inventions in the field of nano dentistry, various materials are developed such as hollow nanospheres, nanopores, nanotubes, nano shells, nanorods, nano capsules, and nanodots, that will play a leading role in material development for dentistry. With the recent advancements, Nanorobotics might utilize specific motility mechanisms to crawl or swim through human tissues with precise navigation. They can sense acquire energy, and change their surroundings, to achieve safe cyst penetration (e.g., they tend to pass through the plasma membranes without causing damage to the cell), and employ newer techniques to monitor or alter the nerve impulse traffic in the individual neurons. **(**1**)**

Nanomedicine is the application of comprehensive monitoring, construction, control, repair, and improvement of all human biological systems, working from the atomic level using engineered nanostructures and nanodevices. It has various applications in diagnosis and testing, infection management, cancer management, gene therapy, and tissue engineering.

Nano dentistry is a Top-Down Approach that includes nanocomposites, nano solutions, impression materials, nanoneedles, and bone replacement materials. Nano dentistry is a Bottom-Up approach that includes local anesthesia, nanorobotic dentifrice-dentrifrobots, dental cosmetics, orthodontic treatment, and diagnosis of oral cancer.

Nanotechnology serves as a great platform for adjusting the physiochemical properties of various materials to produce highly potent antimicrobials. Nanoparticles possess many advantages as active antibacterial groups because their surface area is exceedingly large relative to their size.

Metal oxide nanoparticles such as ZnO, MgO are well known for their highly potent antibacterial effect, as they are stable under harsh process conditions and are regarded as safe to use among human beings and animals. **(**2**)**

Green nanotechnology that uses biological organisms, plant biomass, or extracts is recently considered as an alternative to the conventional chemical and physical methods for the synthesis of nanoparticles in a clean, non-toxic, ecologically sound, and environment-friendly manner. The use of plant materials for the synthesis of nanoparticles could be more advantageous because it does not require elaborate processes as various biomolecules like proteins, phenols, and flavonoids in plants. **(**3**)**

Herein, we focus on the various application of nanotechnology and highlight the emerging nanotechnologies that could enable entirely novel classes of therapeutics.

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Volume 2 Issue 2 February 2021