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Nanotek era in dentistry

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Nanotechnology has been part of mainstream scientific theory with potential medical and dental applications since the early 1990s. According to the definition of the National Nanotechnology Initiative, nanotechnology is the direct manipulation of materials at the nanoscale. This term defines a technology that enables almost complete control of the structure of matter at nano scale dimensions. Nanoparticles, nanospheres, nanotubes, nanofibers, dendrimers and other nanostructures have been studied for various applications to biologic tissues and systems. Nano medicine includes various applications ranging from drug release with nanospheres to tissue scaffolds based on nano technologic design that realize tissue formation, and even nano robots for diagnostic and therapeutic purposes. Drug molecules transported through the body by the circulatory system may cause undesirable adverse effects in untargeted regions. On the other hand, nano robots can recognize unhealthy cells and can find and destroy them wherever they are located. Drug delivery to the exact target is of particular importance in cancer therapy. Similar to nano medicine, the development of nano dentistry will allow nearly perfect oral health by the use of nanomaterial's and biotechnologies, including tissue engineering and nano robots. Current laboratory-bench dental research is exploring designs for restorative systems that biomimetically approximate the very processes by which dental enamel is formed. Nano dentistry will make possible the maintenance of comprehensive oral health by employing nano tissue devices which will allow precisely controlled oral analgesia, dentine replacement therapy, permanent hypersensitivity cure, complete orthodontic realignment etc., all in single office visit. Nanodentistry still faces many significant challenges in realizing its tremendous potential. Basic engineering problem from precise positioning and assembly of molecular-scale parts to economical mass production techniques to biocompatibility and the simultaneous coordination of the activities of large number of independent micrometer-scale robots. However nano technological advances should be viewed in the context of other expected developments relevant to oral health in the coming decades

Biography

Mitesh D Kathariya has completed his Masters in Dental Surgery (MDS) from Rajiv Gandhi University of Health Sciences, Bangalore, India in the subject of Pediatric and Preventive Dentistry at the age of 29 years. Presently, he is working as a READER (Associate professor) at Rural Dental College, Pravara Institute of Medical Sciences, Maharashtra and also pursuing his PhD degree in the same university. He has published more than 15 papers in reputed journals (international and national) and serving as an editorial board member. He has also presented various research papers at national conferences and CDE Programmes including an international paper at Thailand during the Asia Pacific region conference held in 2013.

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