

Current Relevance of Nanotechnology to Medicine and Industry

Agnes Ostafin*

Nanoshell Research Institute; Center for Nanomaterials, NanoInstitute, University of Utah, 36 S Wasatch Dr 5535 SMBB, Salt Lake City, UT 84054, USA

EDITOR NOTE

Nanotechnology based approaches find unprecedented application in the field of medicine and facilitation of safe and sustainable environment. Nevertheless, the key challenge lies in identifying and addressing their consequences on human health and environmental viability as well as understanding the underlying processes based on nanoparticle specific interactions. The research, review and editorial observations published as constituents of second issue in the journal of the current year, verily explores these dimensions of nanotechnology. Specifically, these articles focus on silver nanoparticle rinse based tooth enamel remineralization-hardening; the role of metal nanoparticles in environmental friendly industrial reactions as well as the need to develop nanotechnological approaches to comprehensively fight the current COVID-19 pandemic.

With research and development in materials science and nanotechnology in particular, innovative approaches and strategies are coming to the forefront as preventive measures in dental medicine. Conventionally, fluoride based remineralization of high risk tooth surfaces was being followed over the last century. Callister et al. [1] have investigated such remineralization potential of a novel rinse comprising of silver nanoparticles up on demineralized enamel under in vitro conditions and revealed that this novel approach resulted in substantial improvement over traditional remineralization method. The study has emphasized on further research to characterize the mechanism of action by the silver nanoparticles in rehardening the enamel surfaces as well as optimization of prevention strategies using new materials.

Nanoparticles find a wide range of applications and utilities as sensors, in medicine and as industrially relevant reaction catalysts. With rise in environmental concerns, green industrial reactions are being preferred. In this context, Khaturia et al. [2] reviewed the application of metal nanoparticles as catalysts with focus on industrially relevant green nanocatalysts and green reactions. The study showed that there were several applications of metal (Au, Ag, Pt, Cu, Cd, Ni etc.) nanoparticles in catalysis either in the form of reduced metals or compound form as heterogeneous

catalysts including their use in organic synthesis. The review study highlighted that metal nanoparticles have great advantages in terms of selectivity, reaction efficiency and product yield. Generally, environmental friendly green reactions involve usage of organic free water as solvent and conducting reactions using ionic liquids and reactions that occur at atmospheric pressure. Since metal nanoparticles are synthesized in aqueous solutions and functional in ionic liquids, they meet such requirements of green reactions. The specific advantages of metal nanoparticles uses include generation of lesser waste and few impurities with reduced negative environmental impact, thus rendering the whole catalytic process safe. The study has emphasized on further exploration and synthesis of new, environmental friendly and well characterized green nanocatalysts with wider functions as well as green catalytic reactions.

Imran Moin [3], in an editorial, stressed on development of novel nanotechnology bases strategies for tackling the COVID-19 pandemic. The author has observed that no matter how much technologically advanced medical facilities and scientific achievements are made, human beings are still vulnerable to viral infection which can attack from any unsuspected source. The author noted that social distancing and maintenance of hygiene is the only practical precaution to restrict viral spread until any breakthrough is achieved for its successful treatment.

The articles of this issue are of immense significance in optimization and development of novel approaches for preventive dental care, environmental friendly industrial processes and treatment of viral infections and restriction of its spread.

REFERENCES

1. Callister C, Callister M, Nolan M, Nolan R (2020) Remineralization Potential of a Novel Silver Nanoparticle Rinse on Severely Demineralized Enamel In-vitro: A 14-Day Trial. *J Nanomed Nanotech.* 11:542. doi: 10.35248/2157-7439.20.11.542
2. Khaturia S, Chahar M, Sachdeva H, Sangeeta, Mahto CB (2020) A Review: The Uses of Various Nanoparticles in Organic Synthesis. *J Nanomed Nanotech.* 11:543. doi: 10.35248/2157-7439.20.11.543
3. Moin I (2020) Tackling COVID-19 with Nanotechnology. *J Nanomed Nanotech.* 10:e534. doi: 10.35248/2157-7439.20.11.e534

*Correspondence to: Agnes Ostafin, Chief Scientist Nanoshell Research Institute; fmr Director, Center for Nanomaterials, NanoInstitute, University of Utah, 36 S Wasatch Dr 5535 SMBB, Salt Lake City, UT 84054, USA, Telephone: 8016983955; E-mail: aostafin@nanoshellcompany.com

Received: July 20, 2020; Accepted: July 26, 2020; Published: July 28, 2020

Citation: Ostafin A (2020) Current Relevance of Nanotechnology to Medicine and Industry. *J Nanomed Nanotech.* 11:e535. doi: 10.35248/2157-7439.20.11.e535

Copyright: ©2020 Ostafin A. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.