



Journal homepage: www.cae.sciencearchives.org

(ISSN:2583-1151)



Advantageous opportunities of Nanotechnology: an opinion

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Nanotechnology is developing faster and setting up the aim higher where high-end technological innovation could be witnessed. Tools and devices equipped with artificial intelligence would help us in precision farming, advance pollutant detection systems and bio-remedial approaches, robotics, electronics, next-generation medicine, diagnosis, and therapeutic approaches. The research objectives have been shifting towards technology/product-oriented research where funding is required to support the research and strengthen the knowledge databases. Collaboration among universities, labs, investigators, industries, and even collaborations on a geopolitical level would surely strengthen the approach and would help to boost future endeavors.

The coming decade is going to be challenging in terms of many aspects of life. It could be the adverse climatic and environmental conditions affecting crop yield subsequently rising demand of higher produce, requirement of various industrial goods with greater quality mandates, smart automotive, and many others. Nanotechnology has gained acceptance in the past years, and it has also proven its potential use and application in various key sectors. The current review covers many such areas where metal-based nanoparticles are playing a major role. The review also discusses the prospect and growing concern for the use of nanoparticles in respected areas.

Nanotechnology is an emerging field of science nearly used in every sector. Industries such as agriculture, medicine, chemicals, etc. are few where NPs application has gained popularity and diverse use. Nanotechnology is emerging as one of the greatest tools in contemporary science. In next-

generation medication, advance and targeted drug delivery, tissue architecture, and implants. are the product of cutting-edge Nano-technological innovations. Similarly, cosmetics, chemicals, automotive and other industries have achieved innovative developments owing to the role of NT. It is anticipated that NT is going to become a key economic driving force in the future that can help us to combat challenges associated with agriculture, the environment, industries, medications, and electronics (where miniaturization of components has revolutionized the portability of the devices). Future would also look forward with the great hope of having an increase in productivity, food security, sustainability, technologies for a cleaner environment. Development in Nanotechnology research must address the toxicological and environmental effects. Such studies should be focused on its properties such as hazardous, physicochemical, and biological activities. The mechanistic of NP interaction with crucial biomolecules and biomarkers, toxicodynamics, toxicokinetics, and epigenetics are the key area of development where the knowledge database has to keep updating. Such crucial information on NPs must be brought about in cognizance of the scientific community, entrepreneurs, and regulatory agencies for devising hazardous profiles, dosage, and exposure limits in various media. Overall, consideration of such aspects would hopefully end up providing us broader and flexible policies, regulatory and ethical analysis tools, and public partnership.

How to cite this article:

Ranjan, A. Advantageous opportunities of Nanotechnology: An Opinion *Chemical and Environmental Science Archives*, Vol. 1 (1), 19

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