

The green nature of nanotechnology

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The basic manifestation of the current scientific community is to instigate or provoke the rise of green nanotechnology because it is present in almost all the domains of human life, right from the food processing industry to health. Basically, the use of nanotechnology to enhance the environmental sustainability of processes producing negative externalities is said to be green nanotechnology. It is said to be "GREEN" because it is more environment-friendly and mostly constitutes plant-related affinities and processes. The major constituent is nothing but the nanoparticles themselves ranging between 1 nm to 100 nm in size with a surrounding interfacial layer. Synthesis of nanoparticles includes physical, chemical and biological processes. Majorly, it is a biological-related process where nanoparticles can be synthesized using bacteria, fungi and plants. When we consider the plant-mediated nanoparticle process, the advantages include less toxicity and more biocompatibility. The best example to be mentioned here is the production of gold nanoparticles in a cumin-mediated green nanotechnology process, which can be achieved under biologically benign conditions. In this process, there exist various phytochemicals within cumin, which not only provide an excellent coating on nanoparticles but also provide a robust shielding from aggregations. Green nanomaterials have also been seen on a larger scale these days.

Antimicrobial treatments using green nanomaterials can prevent infectious and hazardous diseases, such as bacterial, fungal and viral infections. When we consider our health, there will arise a need to look into our present status and future prospects for health. Almost all of us will agree to the fact that cancer is one of the dangerous health problems worldwide, and only radiotherapy, chemotherapy and a few other surgeries can help treat them. Here, green nanomedicine acts as an anticancer agent. We know that, carcinogenesis, metastatic cascade and genetic factors are those which influence tumour growth and development. Therefore, the applications of biosynthesised green nanomaterials in cancer thermostatics might pave the way to clinical cancer nanomedicines. Green nanomaterials which include metal nanoparticles as in metals like Au (gold), Ag (silver) can be used in localised drug delivery, gene delivery, medicine, etc. The size of the drug can be reduced up to 2 nm to be more effective and less toxic. The ultimate goal of any economic, technological and social development is to improve human health and well-being. Thus, it is the society that brings new requirements to new technologies moving towards a clean and green technology department. And we as a youth while accepting this new technology as well try to protect our environment and us by reducing wastes generation, conserving nature, minimising greenhouse gas emissions, reducing consumption of non-renewable raw materials, etc.

Keywords: Nanoparticles, Biocompatibility, Nanomaterials, Nanomedicine, Cancer thermostatics

Citation:

Spoorthi S Joshi. The green nature of nanotechnology . The Torch. 2020. 1(8). Available from:

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