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General Account Of Nanotechnology and Nano Toxicology

Dr. K.B.Koteshwara, BSc.,MPharm,DCA,PhD^{1*}

¹Professor & Head, Department of Pharmaceutics, Manipal College of Pharmaceutical Sciences, Manipal University, Manipal, Udupi district, Karnataka state, India

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*For Correspondence

Professor & Head, Department of Pharmaceutics, Manipal College of Pharmaceutical Sciences, Manipal University, Manipal, Udupi district, Karnataka state, India, 576104; Phone: +91-820-292248;
Email: kb.koteshwara@manipal.edu

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NANOTECHNOLOGY AND NANO TOXICOLOGY

Nanotechnology represents revolutionary changes in 21st century with its continuous advancements and progression with time and in knowledge. It has applications in each and every fields of science leaving any aspects untouched. Nanotechnology also embraces many advantages in medicines, diagnostics and drug delivery, thus can be termed as pharmaceutical nanotechnology. Whether, its established drug or new entity, from improving solubility to specific organ targeting, nanotechnology is a platform for improvements to varied applications in pharmaceutical industry. With time and growing knowledge, we are able to better understand the technology and mechanisms involved with term "Nano". Indeed, nanotechnology has provided solutions to many hurdles in various aspects. But it also possesses the limitations and imposes challenge to exploit the technology in such a way that it maximizes the benefits and reduces the toxicity. In other words, it can be said that Nano toxicology is evolving as important branch along with advancing nanotechnology. FDA also faces challenges to provide definition and regulations for nanotechnology; nevertheless, FDA has taken major steps to regulate nanotechnology and its applications in science, engineering and technology. Nanotechnology Initiative (NNI, Washington, DC,) a federal research and development program is established to coordinate the multiagency efforts in Nano scale science, engineering, and technology. In NNI, the US Food and Drug Administration and 22 other federal agencies participate, specifies that nanotechnology involves: research and technology development at the atomic, molecular, or macromolecular levels, in the length scale of approximately 1–100 nm; creating and using structures, devices, and systems that have novel properties and functions because of their small and/or intermediate size; and the ability to control or manipulate on the atomic scale. This major step by FDA provides a hope to revolutionize the era of nanotechnology. This clearly signifies the growing requirement to understand the nanotechnology in more depth and utilizing its applications for betterment in the pharmaceutical industry, weighing the benefit-risk ratio.