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Pharmaceutical Nanotechnology and Toxicology: Current Scenario

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The science of particles has been an area of interest, thrill and full of mystery since beginning. Over the decades we have seen the focus on various types of applications of particulates matter in different areas of technology whether it be pharmaceuticals, cosmetics, paints, coating etc. Nanotechnology in the drug delivery has found renewed applications in the areas of targeted drug delivery due to their very specific nature of affinity for localizing after crossing the physical cell barriers and providing a dosage regimen, which is generally not achievable by conventional means of drug administration. The nanosystems research and applications offer the major advantages like – improved efficacy, reduced toxicity, improved patients compliance and convenience. Nanoparticles based drug delivery systems have created great impact on practically every branch of medicine including cardiology, ophthalmology, endocrinology, oncology, pulmology and immunology and also on highly specialized areas like gene delivery, targeting to brain, tumor targeting, oral vaccine formulations and other areas. However, some unknown health risk, different types of toxicities like cellular, tissue, Immuno, organo etc, unpredictable and undefined safety issues, some clinical as well as regulatory issues still pose formidable challenges.

Keywords: Nanoparticles, Nanotoxicity, Gene delivery.