

# A pathologist's view on nanotoxicology

Shophia Collins

---

Collins S. A pathologist's view on nanotoxicology. *J Nanosci Nanomed.* 2022;6(1):8-9.

## ABSTRACT

Nanotechnology, a new technology encompassing the tiniest known manufactured items, has emerged as a result of advances in chemistry and engineering. These items are gaining traction in the market and look to be on the verge of revolutionising engineering, cosmetics, and medicine. Unfortunately, nanotoxicology, which studies the health impacts of nanoparticles, lags behind breakthroughs in nanotechnology. Over the last decade, research of first generation nanotechnology goods have complemented previous literature on ultrafine particles and respirable durable fibres. Nanosizing appears to enhance the toxicity of numerous particles, according to these research. First, when particle size reduces, surface area rises, speeding up soluble

particulate dissolution and exposing more of the reactive surface of durable yet reactive particulates. . Second, nanosizing allows particles to get through cellular and intracellular barriers more easily. Third, nanosizing allows particulates to interact with subcellular structures, such as microtubules and DNA, and sometimes even hybridise with them. Finally, nanosizing certain particles enhance pathologic and physiologic responses such as inflammation, fibrosis, allergic reactions, genotoxicity, and carcinogenicity, as well as changing cardiovascular and lymphatic function. Understanding how the size and physiochemical features of nanoparticles impact bioactivity is critical for ensuring that nanotechnology's exciting new products are utilised safely. This article presents an overview of nanoparticulate pathology and toxicity.

**Key Words:** *Nanodrug; Genotoxicity; Biocompatibility; Pharmaceutic;*

---

## INTRODUCTION

Scientific advances have enhanced the capacity to produce particular particles in the size range of 1 nm to 100 nm, resulting in a surge in interest in nanotoxicology and Nanoscale Particulates (NPs). As part of the research of ultrafine particles, the toxicity of various NPs has been examined for a long time. NPs, which are components of emissions from combustion and dust-producing industrial operations, are ultrafine particles. The quantity, chemical content and physical features of extremely minute particles in possible workplace and environmental exposures have all altered as a result of nanotechnologies newly designed NPs.

Nanotechnology is the manipulation of matter at the atomic level to build structures that can be used in engineering, research, and medicine to generate new products. Improved synthesis processes, quick developments in chemistry and physics at the atomic level, and a better knowledge of

intracellular structures at the molecular level have all changed nanotechnology. Nanotechnology investments in the United States government totaled \$1.1 billion in 2006. Nanotechnology goods have a market worth of \$254 billion in 2009, with growth expected to reach \$2.5 trillion by 2015. Although others doubt accurate estimates, the growing number of patents supports nanotechnology's growing economic significance. Particulates that have never been researched and others that have only been studied as components of mixes are among the novel created NPs. This article provides an overview of nanotoxicology and toxicologic pathologies in first-generation nanotechnology goods. For toxicologic pathologists used to working in the pharmaceutical business, it's worth noting that the regulation of many NPs differs significantly from that of medicines. Most nonpharmaceutical particles are controlled by their chemical content rather than their size and form, with the

---

Editorial Office, *Journal of Nanoscience and Nanomedicine*, United Kingdom

Correspondence: Shophia Collins, Editorial Office, *Journal of Nanoscience and Nanomedicine*, United Kingdom, E-mail [nanoscience@esciencejournal.org](mailto:nanoscience@esciencejournal.org)

**Received:** 04-Jan-2022, Manuscript No. PULJNN-22-4502 (M); **Editor assigned:** 06-Jan-2022, PreQC No. PULJNN-22-4502 (P); **Reviewed:** 20-Jan-2022, QC No. PULJNN-22-4502 (Q); **Revised:** 20-Jan-2022; Manuscript No. PULJNN-22-4502 (R); **Published:** 28-Jan-2022; **DOI:** 10.3753/puljnn.22.6(1).08-09

---



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes. For commercial reuse, contact [reprints@pulsus.com](mailto:reprints@pulsus.com)

