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Review Article

A Critical Review of Nanomaterials and Their Industrial Applications

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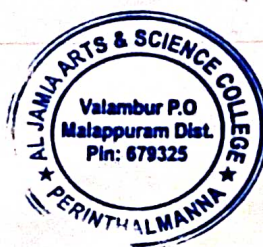
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Abstract

The innovative and universal nature of nanotechnology has extensively driven the interest of scientists for the past few decades. Besides its utilization in several sectors such as pharmaceuticals & drug development, with highly funded government projects to develop a wide range of nanotech-based products, its commercialism is still comparatively poor. Although these technologies enable to resolve the issues with drugs in the pharmaceutical industry, especially reformulating the drugs to improvise their physicochemical properties & the level of toxicity (including the rate of dissolution, bioaccumulation & its toxicological nature compared to the standards recorded in scientific reports. Depending on the experience gained from decades of nanotechnology-derived drug delivery systems and an extensive literature review, it was determined that the main reason for commercialization failure was listed as follows a) insufficient regulative framework system; b) poorly accepted & supported by the consumers (the public), doctors in practice & industries; c) manufacturing criteria including the capability for large-scale production, characterization, quality control, and suitable translation; 4) issues with toxicity, ecological hazardous & safety profiles; 5) inadequate interdisciplinary platforms; and, 6) Lack of IPR (Intellectual property rights) protection. This present review elaborates on the key issues & the trends followed in the industries, the Regulatory role of the USFDA with implications, and the challenges set forth for the successful translation of nanotech-based products from the laboratory to the market.

Keywords: Nanotechnology, Transdisciplinary, Products, Commercialization





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