

Introduction to Nanotechnology in Drug Delivery

Nupoor Sunil Erram¹, Nigar Kadar Mujawar¹, Jameel Ahmed S. Mulla^{2*}

¹Department of Pharmaceutics, Shri Angarsiddha Shikshan Prasarak Mandals ASPM College of Pharmacy, Sangulwadi, Maharashtra, India

²Department of Pharmaceutics, Shree Santkrupa College of Pharmacy, Ghogaon-Karad, Maharashtra, India

Abstract

The field of nanotechnology is the science and process of producing materials with unique properties at the nanoscale. Technology that functions at a billionth of a meter scale is known as nanotechnology. According to their size, nanomaterials are divided into three categories: organic, inorganic, and green. There are several ways to synthesize nanomaterials, including top-down and down-up approaches, which incorporate a variety of synthesis techniques. The prepared nanoscale structure are evaluated employing several tools like dynamic light scattering, scanning electron microscope, transmission electron microscope, zeta potential etc. there are various other methods for evaluation of safety and efficacy of dosage forms like *in-vitro* methods and *in-vivo* methods. The National Institute for Occupational Safety and Health (NIOSH), the Organization for Economic Co-operation and Development (OECD), and the International Organization for Standardization (ISO) are essential organizations participating across the regulatory framework process. Solid lipid nanoparticles will be covered in detail in the next chapter, along with an overview, formulation considerations, evaluation criteria, and many other topics.

***Author for Correspondence:** Email: jameelahmed5@gmail.com

Book Title: Solid Lipid Nanoparticles: Fundamentals, Design and Applications

© IDAAM Publications
All rights reserved



ISBN: 978-81-971590-3-9

Keywords: Nanotechnology, solid lipid nanoparticles, nanomaterials, regulatory aspects, ethical consideration, nanoscale, nanomaterial synthesis, medicine, drug delivery, nanocarriers.

1. INTRODUCTION TO NANOTECHNOLOGY

The method and philosophy of creating specially Nanotechnology is the creation of compounds at the tiny scale. It involves modifying materials at the nanoscale. It is the capacity to develop and use materials, structures, technologies, and systems with essentially novel qualities at the levels of atoms, molecules, and supramolecules [1]. Products, apparatus, and systems whose components and structures exhibit Characteristics that are new and significantly improved in terms of the physical, chemical, and biological aspects, and also the occurrence and procedures made possible through capacity to manage characteristics at the nanoscale, are all described scientifically using nanotechnology.

Poor intestine absorption, dissolution, animal safety, and pharmacokinetics immersion, consistent and focused delivery to the actionable point, remedial efficacy, adverse consequences, and tube oscillations of medications that either collapse outside of the least effective attention or surpass the limit of risk for remedial attention are some of the difficulties with the most advanced medicine delivery systems. The discipline of nanotechnology plays a key role in creating drug delivery methods that can increase the demand for medications. Nanotechnology can be used to restructure medications, increasing their lifespan, improving their performance, improving their adequacy by adding efficacy, enhancing case compliance plus security and results lowering health care expenses. Nanotechnology is a broad technical platform with a vast range of possible uses. Nanotechnology can manipulate the fundamental level of atom and molecular organization that defines the functioning of living organisms and manufactured goods [2].