OPEN ACCESS Freely available online

Journal of Biomedical Engineering and Medical Devices

Editorial

Nanomedicine: An Overview

Suprabha Pradhan*

Department of Microbiology, Utkal University, Bhubaneswar, Odisha, India

EDITORIAL

Nanomedicine is the use of nanotechnology in medicine. Nanomedicine encompasses everything from medicinal nanomaterials and biological devices to nanoelectronic biosensors and potentially future molecular nanotechnology applications such as biological machines. Nanomedicine's current challenges include determining the toxicity and environmental impact of nanoscale compounds (materials whose structure is on the scale of nanometers, i.e. billionths of a meter). Interfacing nanomaterials with biological molecules or structures can provide functionality to them. Because nanomaterials are close in size to most biological molecules and structures, they can be used for biomedical research and applications both *in vivo* and *in vitro*.

Diagnostic gadgets, contrast agents, analytical instruments, physical therapy applications, and drug delivery vehicles have all been developed as a result of the integration of nanomaterials and biology thus far. Nanomedicine aspires to provide a helpful collection of research tools and clinically relevant gadgets in the not-too-distant future. New commercial uses in the pharmaceutical business, according to the National Nanotechnology Initiative, might include enhanced drug delivery systems, new therapeutics, and *in vivo* imaging. The US National Institutes of Health Common Fund programme is sponsoring nanomedicine research and supporting four nanomedicine development centres. Nanotechnology has made it possible to use nanoparticles to deliver medications to specific cells. By depositing the active medication solely in the morbid region and at no greater dose than required, overall drug consumption and adverse effects can be greatly reduced.

The goal of targeted medication delivery is to eliminate drug adverse effects while also lowering drug intake and treatment costs. The goal of drug delivery is to maximize bioavailability in specific areas of the body and throughout time. This could be accomplished by using nanoengineered devices to target molecules. Smaller gadgets are less intrusive and can potentially be implanted inside the body, and biochemical reaction times are much faster when using nanotechnology for medical technologies.

These devices are more sensitive and faster than traditional medication delivery systems. The efficacy of drug delivery by nanomedicine is largely determined by: a) efficient drug encapsulation, b) successful drug delivery to the targeted region of the body, and c) successful drug release. Drug delivery systems, such as lipid or polymer-based nanoparticles, can be engineered to optimise the drug's pharmacokinetics and biodistribution. The pharmacokinetics and pharmacodynamics of nanomedicine, on the other hand, differ greatly amongst people. Nanoparticles offer favourable qualities that can be employed to increase medicine delivery when engineered to circumvent the body's defence processes. Drug delivery systems that can get medications through cell membranes and into the cytoplasm are currently being developed. One technique for medicinal compounds to be used more efficiently is through riggered response. Drugs are implanted in the body and only activate when they come into contact with a specific signal. A medication with low solubility, for example, will be replaced with a drug delivery system that includes both hydrophilic and hydrophobic environments, enhancing solubility.

Correspondence to: Suprabha Pradhan, Department of Microbiology, Utkal University, Bhubaneswar, Odisha, India, E-mail: Suprabha.p@gmail.com

Received: June 10, 2021, **Accepted:** June 17, 2021, **Published:** June 24, 2021

Citation: Pradhan S (2021) Nanomedicine: An Overview. J Biomed Eng & Med Dev. 6:170.