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Nanotechnology and Nanoparticles: An Overview

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Abstract

The use of immunohistochemical labelling in the diagnosis of aberrant cells, such as those found in malignant tumours, is common. Specific biological events, such as growth or cell death, are marked by specific molecular markers (apoptosis). Immunohistochemistry is also commonly employed in basic research to determine the distribution and localization of biomarkers and differentially expressed proteins in various areas of a biological tissue.

Keywords: ***Nanotechnology; Nanoparticles; Antimicrobial; Nanomedicine***

Introduction

Nanotechnology is a modern discipline of science that has become more important in everyday life. Nanotechnology is concerned with the creation, manipulation, and application of nanometer-sized materials. Our surroundings are undergoing massive smash-up as a result of rapid industrialization and urbanisation, and an outsized amount of hazardous and unnecessary chemical, gases, or substances are released. As a result, our need to learn about the secrets that are present in nature and its products is driving advancements in nanoparticle synthesis processes. Because of their unique features, biological molecules are ideal candidates for nanotechnology applications. Nanoscience is centred on manipulating individual atoms and/or molecules to create materials for use at sub-microscopic scales. Based on certain qualities such as size, distribution, and shape, the nanoparticles exhibit completely new or better properties. Nanotechnology is one of the most promising areas of research in the field of material science today. Nanoparticles and nanomaterials are finding new applications in a variety of industries. Nanotechnology is emerging as a rapidly expanding discipline with applications in science and technology for the purpose of creating new nanoscale materials. Biosynthetic technologies involving biological microorganisms such as bacteria and fungi, as well as plant extract, have recently emerged as a simple and feasible alternative to more compact chemical synthetic approaches for obtaining nanomaterials. Nano-crystalline silver particles have been found tremendous applications in the fields

of high sensitivity biomolecular detection, diagnostics, antimicrobials, therapeutics, catalysis, and micro-electronics. However, there's still a requirement for economic commercially viable also as an environmentally clean synthesis route to synthesize the silver nanoparticles. Silver is well known for possessing an inhibitory impact on many bacterial strains and microorganisms generally present in medical and industrial processes. Silver nanoparticles among various metal nanoparticles have gained important consideration because they're powerful antimicrobial agents that shows low toxicity, and have diverse in vitro and in vivo applications. Among nanomaterials, silver nanoparticles play an important role in the field of biology and medicine due to their physiochemical attractive properties. Silver nanoparticles are reported to possess anti-fungal, anti-inflammatory, anti-viral, anti-angiogenesis, and antiplatelet activity. In medicines, silver and silver nanoparticles have an application of skin ointments and creams containing silver to prevent infection of burns and open wounds, medical devices, and implants prepared with silver-impregnated polymers [6]. In textile production, silver-embedded fabrics are now utilized in sporting equipment [7]. Several medicines are available within the market supported silver like silver sulphadiazine, etc. for the treatment of burn and the chronic wound infected with microbes. Silver nano gels/sprays are also worth mention for their effectiveness in cosmetic and drug industries for medical goals. Although there are some ways available for the synthesis of silver nanoparticles including chemical, physical, electrochemical, irradiative, photochemical, and biological methods.

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