

Nanotechnology and medicine.

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Abstract

The definition of nanotechnology and the relation between nanotechnology and medicine is given. The advantages and disadvantages of nanotechnology is discussed.

Keywords: Nanotechnology, Medicine, Nanomedicine, Nanoparticles.

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Nanotechnology is the science of the small, nanotechnology is the manipulation of matter at the atomic and molecular scale to create many new materials, devices and systems using nanoparticles (nanoscale particle), and it deals with construction of materials with small scale from 1 to 100 nm ($1\text{ nm}=10^{-9}\text{ m}$) and at nanoscale, materials start to create their new physical, chemical and biological advanced properties. It has many applications in different fields such as: Medicine, Energy and Electronics, Environment, Healthcare, Water cleaner, Chemical sensors, Fabric, and etc. There are several advantages and disadvantages of nanotechnology: for example some of the advantages are: (a) It protect drugs from being degraded in the body before they reach their target; (b) Enhances the absorption of drugs into the cancerous cells; and (c) Prevent drugs from interacting with normal cells. Some of the disadvantages of nanotechnology are: (a) It is very expensive and its developing cost is high; (b) Its manufacturing is difficult [1-4].

The usage of nanotechnology in different areas of medicine is called nanomedicine. It can be defined as repairing and controlling the biological systems of the human body using instruments that have been constructed and designed according to nanotechnology level and principles. Advanced medically programmable devices are developed which allow doctors to reach the human body at the cellular and molecular levels and repairing the damaged tissue. Nanotechnology can be used in many fields of medicine: Pharmaceutical drugs and their preparation, Conception, Diseases in general and especially in Cancer treatments, Diagnosis, Therapy, and Surgery. The general applications that are being invested in are drugs, instruments and sensory bots. Nanomedicine is an interdisciplinary field of science in which even a simple project needs contributions from physicists, mathematicians, engineers, chemists, biologist and the users such as an orthopedic surgeon. Nanomedicine involves at least three major fields: Nano diagnosis, controlling the drug delivery (Nano therapy) and remedial and renovated medicine. Nano diagnosis is the evolution of devices and image devices to detect and analyze the diseased condition or cellular malfunction and unmoral cells. The Nano therapy aims to assign effective nano-systems involving recognition parts to work or transfer and deliver drugs exclusively in cells or influenced areas in order to perform a more effective therapy by minimizing the side effect at the same time [4-9]. Renovated medicine aims to fix or replace deteriorated tissues and organs using nanotechnology materials

and equipment's. The goal of nanomedicine might be defined as the global supervision, observation, building, restoration, protection and refinement of all human biological parts and organs, functioning from the molecular scale, using engineering designed devices and nanoscale structures to obtain medical advantages. Nanomedicine is the section of nanotechnology and nanoscience that would permit the capability to treat disease from inside the body and at the cellular or molecular level; it is one of the most hopeful fields within the prospect new technological improvements in medical area. There are abundant drugs and medicinal technologies that can cure conditions, like: (a) Nanoparticles that kill cancerous cells; (b) Nanoparticles to help the bones to regenerate; (c) Fluorescent nanoprobe instillation minimize risk of the adverse events; (d) Ultrasound to permeate bone; (e) Nanoparticles to monitor cancer cells and many other diseases; (f) Directed cancer therapy; (g) Technology to get better lung cancer exposure; (h) Imaging tricks to watch Alzheimer's growth; (i) New ways to cure tumors with antennas; (j) Body sensors, and Medical reporters and mobile diagnostics, etc. The immune system has power to realize and kill pre-cancer cells and cancerous cells, but in spite of the immune system, residual tumor cells find out how to get-away from the immune system after immune chosen. Cancer immunotherapy enhance strategies to beat these problems. Nanomedicine usage in cancer immunotherapy involve the Nano diagnostics and Nano biopharmaceuticals [1,10-15].

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