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A Review on Nanotechnology and Medicine

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Review Article

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ABSTRACT

Nanotechnology is the study of systems at the molecular scale and the cellular level of the cells. Nanotechnology mainly focuses on science and engineering at a very small scale that is in Nano scale, which measures bout 1-100 nanometres. Nanotechnology helps in understanding the fundamentals of physical sciences, analytical chemistry and mainly in the molecular biology for the study of extremely small size objects. Today Scientists are making the nanomaterial's is such a way that they are strength, lighter in weight, and higher chemical reactivity than their major-scale counterparts.

INTRODUCTION

Nanotechnology in medicine offers some exciting opportunities in research field and in much advancement of Science and Technology and further investigations are going on medical related fields. Nano medicine is a branch of Nanotechnology helps in delivering a valuable set of research tools and clinically useful devices in the near future [1-7].

Nanomedicine mainly focuses on nanomaterials, biological devices, and nanoelectronic biosensors, for further applications of molecular related nanotechnology such as biological tools and machines. A major problem for nanomedicine includes issues causing for toxicity and environmental impact of nanoscale materials [7-15].

Nanotechnology in Drug Delivery

Recent research has shown unprecedented development in the areas of Nanoscience, Nanophysics and nanotechnology. Nanomedicine plays an important role in the near future mainly in the fields of Science and technology and helpful for the betterment of life and a new era in the field of Medicine [16-20].

Nano medicine mainly involves nanoparticles to deliver or inject drugs, like heat, light or other substances to recognise some tumour related cells which causes cancers or carcinoma. Nano Particles are specifically made specifically inured in order to attract a diseased cell, which involves treatment of tumour related cells. This technique mainly reduces side effects to health cells and helpful for the easy detection of cancer [21-27].

For Instance nanoparticles are used to target the cancer cells but not healthy cells. Research is going on nano materials which are helpful for the easy detection of cancers, carcinomas sometimes they may causes deaths. Some of the companies or research organisation are taking permission from patient for the easy delivery of

nanomaterial's of and once if it is done they can directly use in cancer patients without any side effects. Many research groups, companies; organisations are conducting many trials in order to release the drug's safety into the cancer cells without causing any side effects to the patients [28-34].

Researchers all over the world are developing a medically related nanoparticle that can be taken orally and which passes through the stomach lining and the intestines are released into the bloodstream. Many investigations are going on lab animals for example such as lab mice in which the drugs are delivered to a target cells [34-40].

Nanotechnology in Therapy Techniques

Nano sponges are the new advancement in nanotechnology their main function is to absorb toxins from the blood and completely remove the toxins from the bloodstream. Nanosponges are coated with a red blood cell membrane the RBC membrane allows the nanosponges to travel freely in the bloodstream and mainly attract the toxins [41-46].

For noninvasive surgery & other surgeries the researchers have demonstrated a method to generate sound waves that are most powerful, and they are tightly focused on the target cells. The aim of this study is to use a lens coated with carbon nanotubes to convert light from a laser to focused sound waves. The main aim of this study the drugs should reach the target cells but not healthy cells which may leads to the death of the tissue [47-54].

Many studies are going on bismuth nanoparticles to treat cancer tumours and carcinomas. Initial studies have showed that the bismuth nanoparticles will increase the radiation dose to the tumour to maximum percentage and reduce the side effects [55-58].

Polyethylene glycol-hydrophilic carbon clusters (PEG-HCC) their main function is to absorb free radicals from the proteins and amino acids. This function of working by PEG –HCC is to absorb free radicals they may reduce the harm caused by the release of free radicals after any brain related injuries [59-63].

Targeted heat therapy used to treat breast related cancers. In this strategy the antibodies gets strongly attracted to proteins in one type of breast cancer cell that are attached to nanotubes, causing the nanotubes to accumulate at the tumor [64-69].

Nanotechnology in Diagnostic Techniques

In order to study the levels of nitric oxide the carbon nanogels are injected under the skin. The level of nitric oxide plays an important role in the inflammation in the body, and easy monitoring of inflammatory diseases. Many studies are going on sensors these sensors can detect the very low amount of cancer cells or tumours causing cancer cells in blood sample [70-73].

Now a day it's a very easy process for the early detection of cancer cells. The nanoparticles attached tightly to blood molecules indicating the early stages of infection leading to cancers. In this method the sample gets scanned for the nanoparticles enhance the Raman signal, allowing feasible detection of cancer causing cells and destroy the malignant cells [74-82].

Kidney damage can be easily detected by nanorods. Protien released by the kidneys gets attached to the nanorods and easily helps in identifying the cancer causing cells and destroy the tumour cells [83-86].

Nanotechnology in Anti-Microbial Techniques

Scientists are developing an anti-microbial technique with the help of nanoparticles and infrared light rays to kill the bacteria. This method is mainly implemented in cleaning of instruments especially for hospitals for treating the biomedical wastes [87,88]. Studies are undergoing on the use of quantum dots to treat antibiotic resistant infections and the use of polymer coated iron oxide nanoparticles to treat bacterial related chronic infections. For treating wounds the Nano crystalline silver is used as an antimicrobial agent.

Nanoparticle cream has been effective against microbial related infections. Nanoparticles contain nitric oxide gas, which are used to kill the bacteria and reduces the bacteria related infections. The new technology known as burn dressing that is coated with nanocapsules is a new advancement in the nanotechnology containing antibotics. The Burn dressing is very useful in the curing the infection and also reduces the number of dressing times and helpful in the cure of infection [89-91].

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Nanotechnology in Cell Repair

Nano robots the new advancement in nanotechnology helps in treating the specific disease causing cells, and helps in the natural healing processes. They are mainly useful in health related applications. Perhaps the most exciting of this cell repair repairing our bodies at the cellular level. Many techniques are used for building nanorobots are being developed that should make the repair of our cells possible [92-94].

Nanorobots would be able to repair damaged DNA and allow other cells to function correctly. These nanorobots work at the very cellular level and damage the diseases cells thus the cells will not grow to the tissues and inhibits the growth of tumour cells at the cellular level [95,96].

CONCLUSION

A nanoparticle holds effective potential in delivering drugs to the target cells and reduces damage to the healthy cells. A new branch of Nano technology helps in treating the target diseased cells without affecting the health cells. To overcome many problems of gene and drug delivery, nanotechnology has gained much interest in recent years. Nanomaterials with different compositions and several chemical and biological properties have been extensively investigated for drug and gene delivery applications.

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