Anticipation of the Future of Nanotechnology

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Abstract

Nanotechnology is an innovative area in science, with vast applications in medicine. Reports about the current success and future potential of nanotechnological innovation in the field of medicine are recently illustrated with images that depict speculative, futuristic visions. Therefore, based on a case study about visionary images of nanorobots and their advantages, these images serve as a means of communication.

Keywords: Nanotechnology; Applications

Introduction

Nanotechnology is the study of science and engineering that has vast applications involved in the design, characterization and synthesis of nano materials or particles that is atleast one dimension on the nanometer scale. Nanotechnology is an emerging science that has rapid and strong future developments. According to scientists. The study of nanomaterials is predicted to have four distinct generations of advancement [1].

The first generation is all about the material science with the properties that are enhanced by incorporating "passive nanostructures" which can be in the form of coatings, the usage of carbon nanotubes to strengthen the plastics. Therefore, the second generation is about the use of active nanostructures. The structures are made bioactive to provide a drug at a specific target cell or organ. This can be done by coating the nanoparticles with specific proteins [2].

The complexity in the third and fourth generations is advanced nano systems like Nanorobotics and molecular nanosystem that helps in controlling the growth of artificial organs [3].

Despite the use of nanoparticles in the pharmaceutical applications, nanotechnology remains as an highly important topic. During the expert discussions and public debates about the status and goals of current nanotechnology research and applications, anticipation of possible future plays a vital role. The nanomaterials and devices are designed to interact with the cells and tissues at a subcellular level, therefore the important applications in medicine and physiology has a high degree of functional specificity, thus allowing integration between technology and biological systems.

Discussion

The vast applications of nanotechnology in medicine are fluorescent biological labels, gene delivery, drug and also the detection of harmful pathogens, probing of DNA structure, detection of tumors, tissue engineering and purification techniques and separation of biological molecules. Phagokinetic studies and MRI also come under the important applications of Nanotechnology.

The main research of nanomedicine is a long term goal and was found to be characterization of quantitative molecular scale components defined as Nanomachinery. The study of nanomachinery helps in precise control and manipulation in cells which can help for a better understanding of the cellular mechanisms. Further to the development of advanced technologies, such as early diagnosis and also the treatment of various diseases.

The other important future of nanotechnology is molecular imaging. Molecular imaging has emerged as a powerful tool to visualize the molecular events of an underlying disease and also downstream manifestation.

Conclusion

The main significance of this research is about the development of a platform technology that influences nanoscale imaging which helps in designing the probe for molecular mechanisms in living cells. The merging of nanotechnology with molecular imaging provides a versatile platform for the novel design of nanoprobes that has a tremendous potential to enhance the sensitivity, specificity and signaling capabilities of various biomarkers in human diseases.

References

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