Biomedical Nanotechnology
The Face of New Medicine

Introduction

While it is often thought that bigger is better, changes in technology have proved otherwise. The first computers and cellular devices were massive, but, as time change, our electronic devices have become smaller and smaller. The human body is generally considered as one big organism made of millions of cells that cannot individually be seen with the naked eye. A red blood cell is in the range of $10^{-6}$ meters and they are being treated with drug particles that are $10^{-4}$ meters in size. A drug particle is unable to directly inject itself in the RBC, and therefore many medical treatments have fallen short of their potential. I will focus on the advancements of nanotechnology in the treatment of neurodegenerative diseases.

Background

Biomedical nanotechnology forms a hybrid between 2 rising fields in science today: medicine and technology. The mixing of these two fields can revolutionize the way we detect and treat growing diseases.

Chemistry and the understanding of physiological reactions that occur in the human body on a day-to-day basis have been studied for many years. However, the ability to manipulate these reactions is a recent discovery and continues to grow with nanotechnology in the modern day.

Biological molecules in the human body, specifically human cells, are on a micro level. Through the use of nanotechnology, researches have gained the ability to alter the physical and chemical properties of molecules on a nano scale.

Significance

Nano technology has created novel devices for the treatment of various neurological diseases. Efforts are being made to focus on nanoneuromedicine for treatment of diseases that we once thought were incurable, including Alzheimer's disease (AD), Parkinson's disease (PD), amyotrophic lateral sclerosis (ALS), and multiple sclerosis (MS).

Research is growing to treat diseases for which treatment was once unimaginable, including cancer, ND diseases and many more.

With nanotechnology researchers are able to control cells from the inside to alter the metabolic processes.

Contact information:
Najiba Afzal
General Biology
nafzal4@csustan.edu
CSU Stanislaus

NEURODEGENERATION

Neurodegeneration is an umbrella term for the progressive loss of neuronal function. Neurodegeneration can be found in many different levels of neuronal circuitry ranging from molecular to systemic.

Future of Nanotechnology

Nano technology has the potential to generate therapeutic devices that will inhibit or reverse neuropathology of Alzheimer's and Parkinson's through promotion and functional regeneration of damaged neurons.

Therapeutic devices will also provide protection of foreign molecules while simultaneously delivering neuroactives such as drugs, genes and cells across the blood brain barrier.

Selected References


