

Nanomedicine

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Nanotechnology is a field that has grown immensely over the past decade. It is being employed in many different industries, one of which is medicine. The thought of nanoparticles being able to seek out cancer cells, replace or heal healthy cells, or deliver medicine right to where it needs to go has fueled this boom.

A nanoparticle is a billionth of a meter in size and can fit easily into the cells of the body. An important application that is under development right now is drug delivery. Currently many drugs are not as effective as they could be because they are not absorbed completely by the cells of the body or do not stay in the body for an effective amount of time. Nanoengineered delivery devices can be manipulated to stay in the body for a specified amount of time or only work when certain triggers are encountered. They are also small enough that they can enter the cell easily. An example of this would be a drug that would normally be administered by a shot but is instead swallowed in pill form. The nanoparticles are small enough to pass through the walls of the stomach and into the blood stream.

Nanoparticles that make cancer cells magnetic and help in imaging them are also being proposed. The particles are made of magnetic iron oxide and coated with antibodies that can only be found in cancerous cells. When introduced to the body, they will attach to the cancer and an MRI done with produce a better image of where the cancer is.

One method for destroying tumors that has begun to be tested in humans is Aurolase® therapy from Nanospectra Biosciences. The treatment uses nanoparticles know as Auroshell®

particles that are designed to circulate in the blood for a long rate of time. This allows it to fully enter the tumor in the body. It is able to enter the tumor because when tumors grow they create a blood supply that has tiny holes in the blood vessels that the particles can enter. Tumors also tend to retain substances. The shells also are designed to absorb near infrared waves. An infrared laser is placed in the tumor or around it and release the near-infrared waves. This leads to the Auroshells® taking the waves energy and turning it into heat, effectively destroying the cancer from the inside.

Nanomedicine has the ability to change healthcare completely and fight the diseases that effect numerous people.

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