

## Nanobots in the field of medicine

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Nanorobotics is an upcoming technology that focuses on designing machines or robots with the component's size in nanometres. Such devices are popularly referred to as nanobots, nanites, nanoids, nanomites or nanomachines. The potentiality of integration of photolithography, nanoelectronics and new biomaterials has opened up a new avenue for manufacturing nanorobots for general medical applications, such as drug delivery, diagnosis, surgical instrumentation, etc. The medicinal field can be improved to a greater extent due to the advantage of nanotechnology to transport numerous amounts of nanobots in a single injection. As a result of advances in artificial intelligence, it is possible to program these nanobots to adapt to the environment and perform the functions accordingly prior to injecting them into the body. This helps in the proper monitoring and treatment of a disease. Nanobots have been used in the Blue Brain Project of IBM which aims at developing the world's first virtual brain that will enable human beings to scan themselves into the computers and will eventually help to preserve the knowledge, skill, and intelligence of a person forever.

The nanobots will monitor the activities and structure of the central nervous system and will help in uploading the natural human brain into computers by traveling throughout the circulatory system including the spine and brain. Thus, the nanobots can act as an interface between the natural brain and computer and thereby will be useful for patients with Alzheimer's disease and for persons with hearing disability, allowing them to hear through direct nerve stimulation. Nanorobotics has found applications in the field of haematology, which involves various functions ranging from the development of artificial methods for oxygen transportation inside the body after an extensive attack to the formation of clots with better clotting capabilities in life-threatening haemorrhage situations. Hypothetical nanobots termed 'respirocytes' can act as artificial red blood cells when injected and perform their functions in emergency cases. Another type of nanobots known as 'clottocytes' have the capability of mimicking the natural platelets and work as artificial platelets for halting the bleeding. In the field of cancer theranostics, nanobots designed with embedded chemical sensors and having enhanced detection abilities can contribute to the overall management of patients. Nanobots can also be used to prevent biohazards and to improve the response to epidemics. More applications of nanobots in the medicinal world are being explored and their importance will only keep on increasing.

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