

NANOTECHNOLOGY IN MEDICINE

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Introduction. Nanorobotic is a form of technology that is used to create machines or robots close to a microscopic scale of a nanometer. Molecular machines are largely in the research-and-development phase, but some primitive nanobots have been tested. The main element used is carbon in the form of diamond or fullerene nanocomposites due to its stability and chemical inertness to steer clear of attacks by the host immune system. The come-out technology of nanobots in medicine provides new strategies for battling chronic diseases, for example, cancer.

Aims. To study incorporating medical nanorobotics helping to treat common disorders including chronic diseases.

Materials and methods. The analysis of literature sources, including search in the database "Medline" by keywords "nanobots", "nanorobotics", "nanoscale robots".

Results and discussion. Nanorobots consist of molecular sorting rotors, propeller, fins, sensors. Molecular sorting rotors are used to adjust the directed motion, a propeller is used to drive forward against the blood stream, fins are located around the propeller and help to guide the device, and sensors are used to convert measures of the physical quality into a signal which can be read by the observer. The nanorobot roaming through the bloodstream after injecting or ingestion. Microscopic machine starts navigation processes and settles in the needed place, it then detects the problematic area and works on destroying the issue.

How does nanorobot help in treatment of several diseases? Scientists developed a fighting nanorobot that is able to disrupt the tumor without any damage of healthy tissues. The moment nanorobot detects the tumor, it begins to release a large amount of thrombin into the vessels supplying neoplasm. This disrupts blood supply and leads to tumor death. Another nanorobot due to small ultrasonic generators can disrupts kidney stones. Blood clots can be removed using special nanorobots fitted with blades.

Conclusion. The biggest benefit of nanobots is their exceptional durability. Many superior companies are funding research and development at this area to provide scientists all the materials they need to make this a successful technology that will be able to put in use in the medical field. Scientists expect this technology can be utilized to improve targeted correction of congenital genetic defects of the human body, as well as increase the effectiveness of cardiovascular, oncological, infectious, and other diseases treatment.