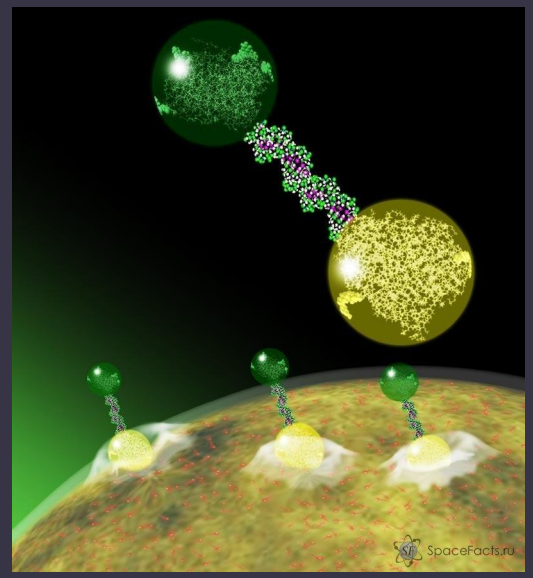
Perm State Medical University

Nanotechnologies in medicine



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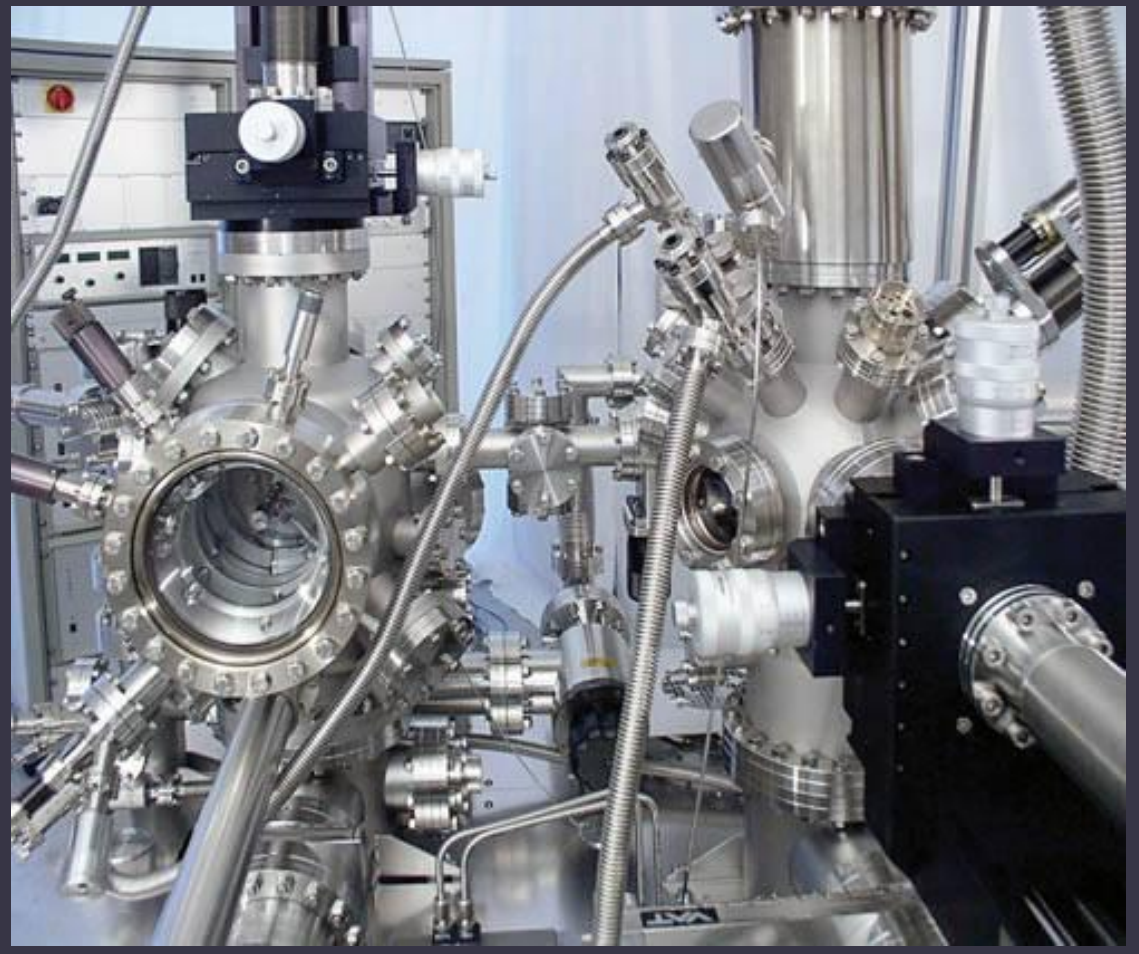
Feature of nanomedicine is that it represents the most difficult process in which new methods or a medical product give new opportunities and the best decisions, without replacement of the previous medical technique or the production technology of a medical product.

Use of nanotechnologies in medicine gives new life to the old, checked by time methods and technologies of recovery of health of the person, and also extension of his life, without any change of all technological chain existing today.

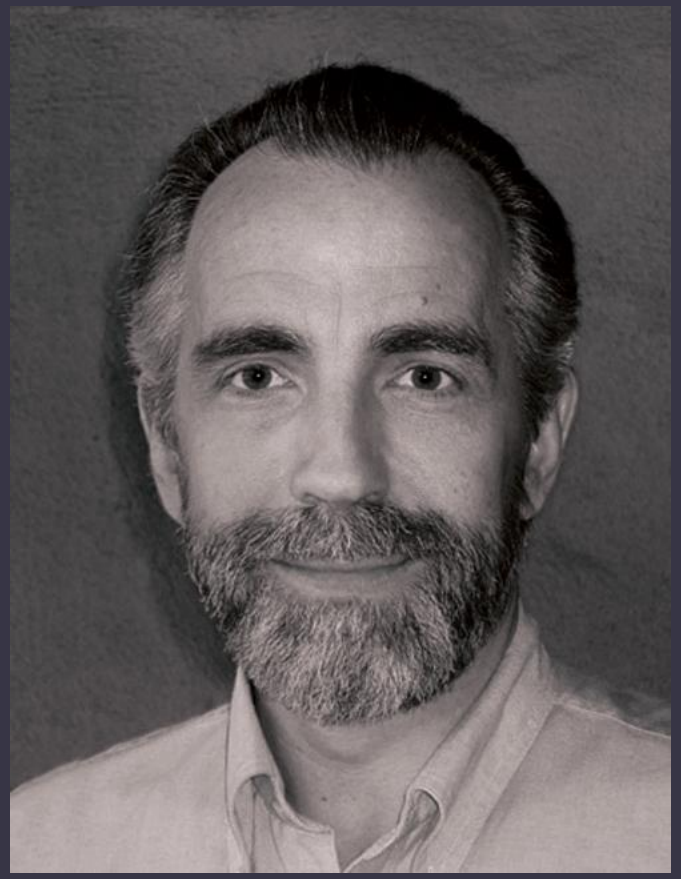
For the first time, Richard Phillips Feynman spoke about nanotechnology, in 1959 he expressed the idea of the possibility of manipulating matter at the atomic level.

Later, tunnel and atomic-force microscopes were invented, allowing to see individual atoms and manipulate them.

The result of these discoveries was the work of Drexler, who considered the possibility of assembling particles and molecules.

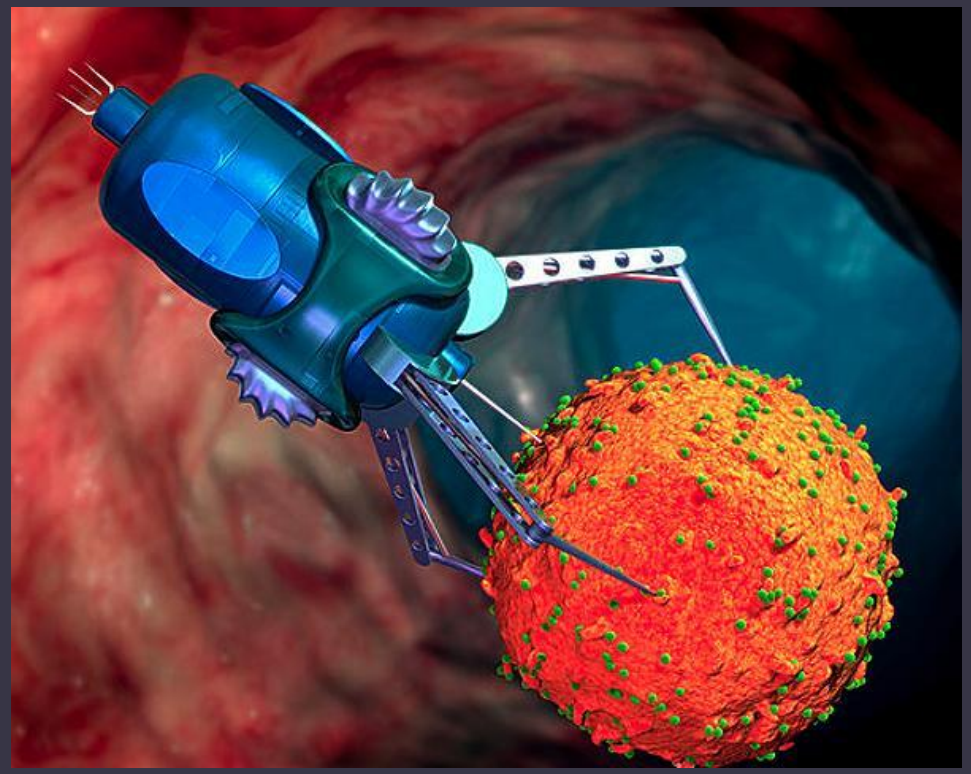


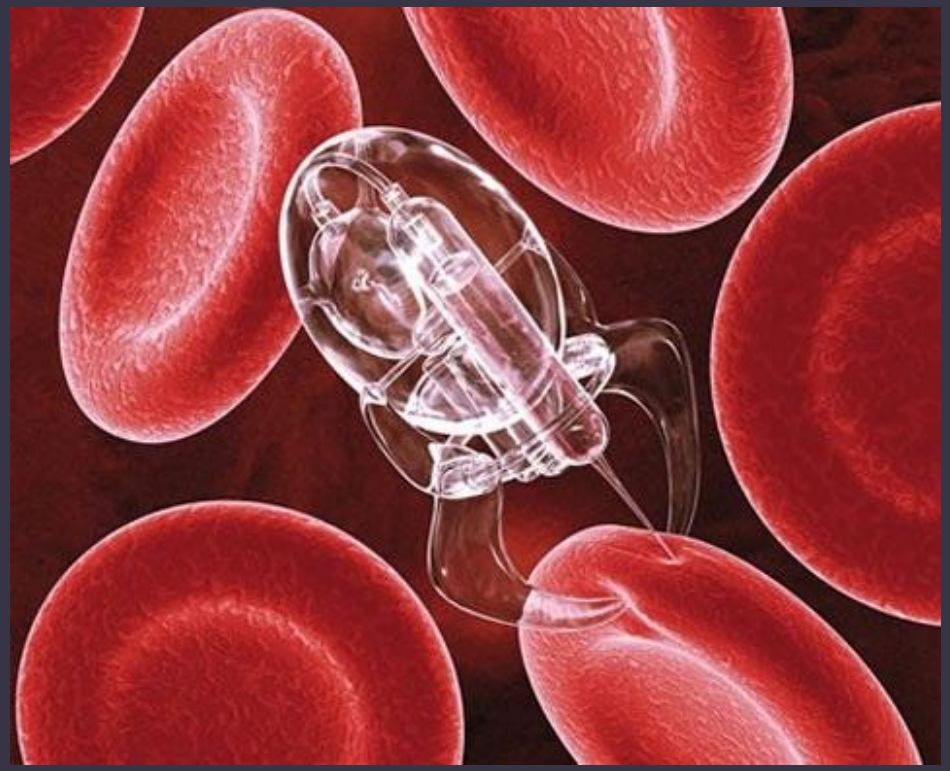
Nanomedicine - tracking, correction, design and control of human biological systems at the molecular level, using the developed nanodevices and nanostructures.



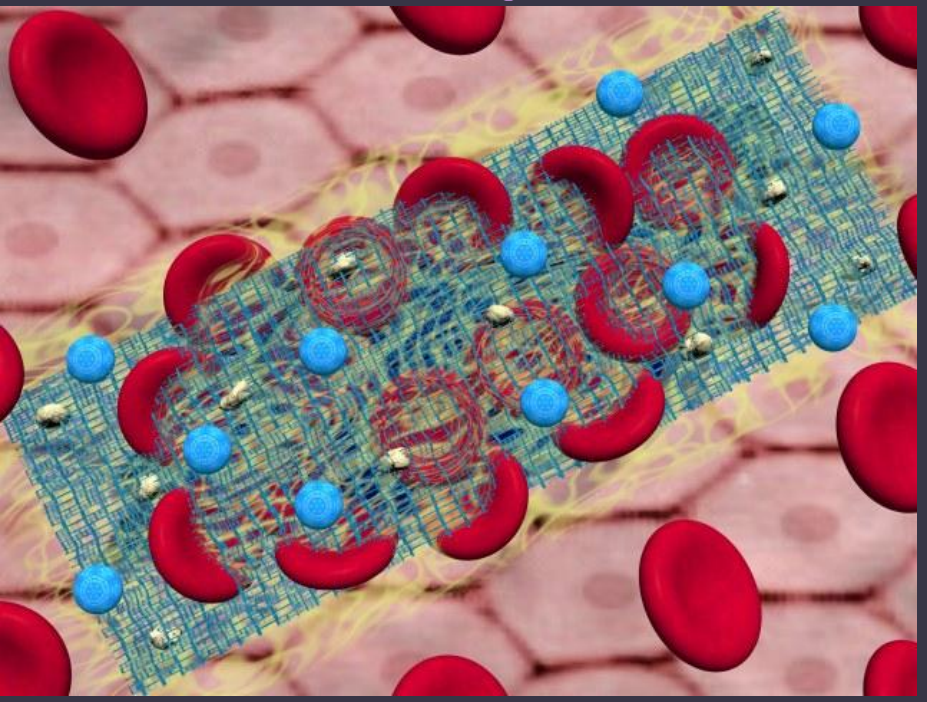
A classic in the field of nanotechnology developments and predictions, Eric Drexler described the main methods of treatment and diagnostics based on nanotechnology.
The key problem is the creation of cell repair machines, the prototypes of which are nanorobots, also called assemblers or replicators.

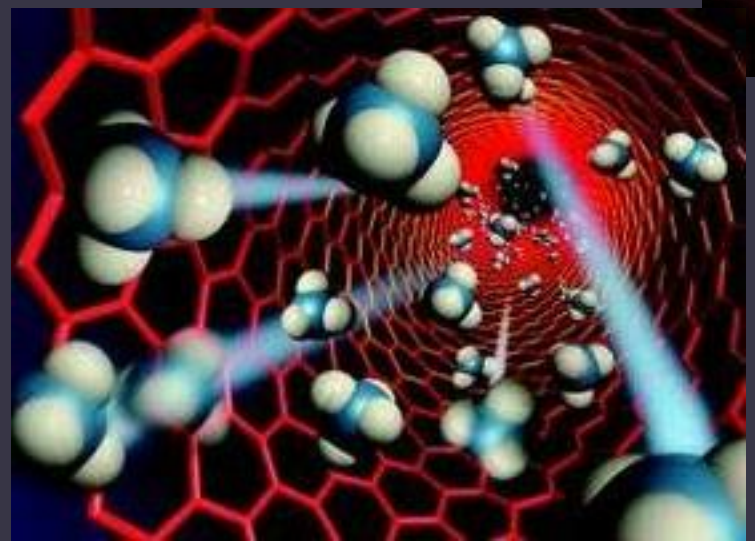
Nanotechnology is a set of methods and techniques for manipulating matter at the atomic and molecular levels to produce final products with a predetermined atomic structure. Nanotechnologies provide the ability to create and modify objects that include components with sizes less than 100 nm, having fundamentally new qualities and allowing their integration into fully functioning larger systems.



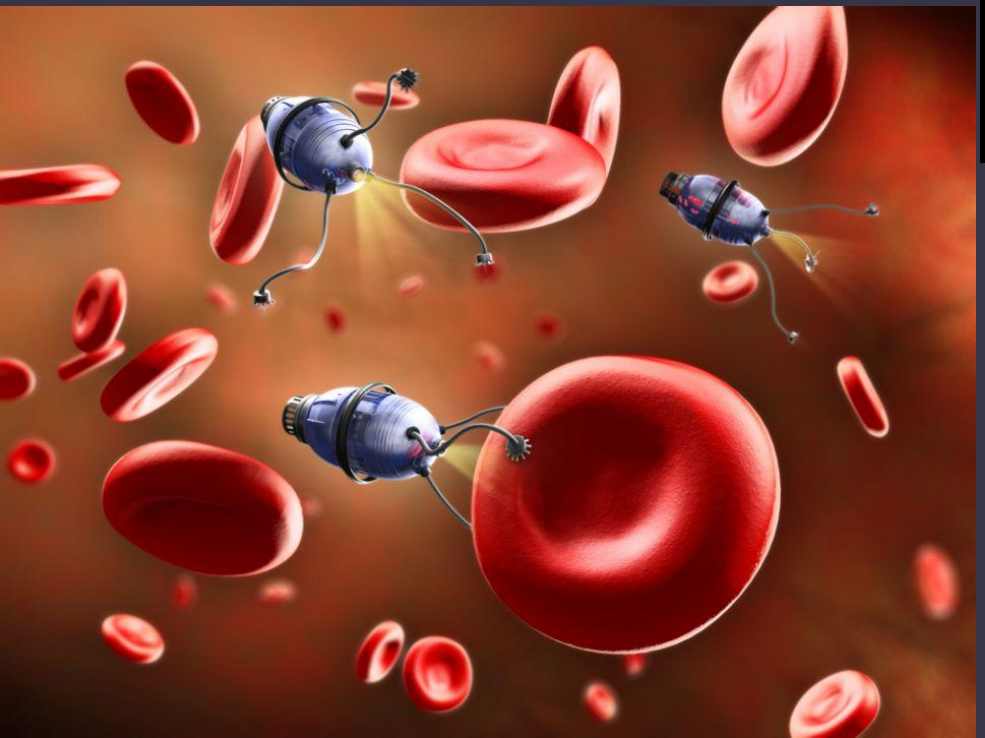


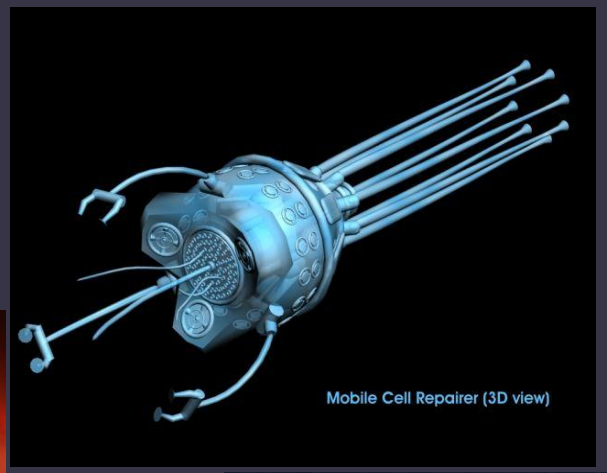
Among the projects of future medical nanorobots, there already exists an internal classification - in the field of their work: microphagocytes, respirocytes, clottocytes, vasculoids and others.

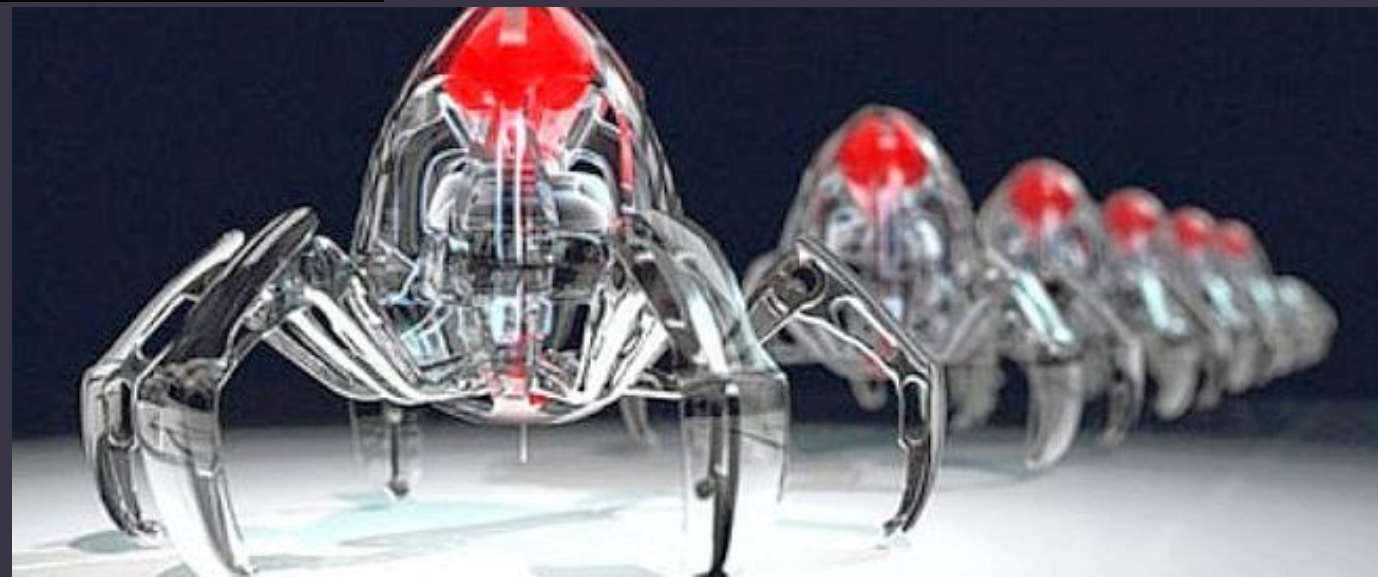




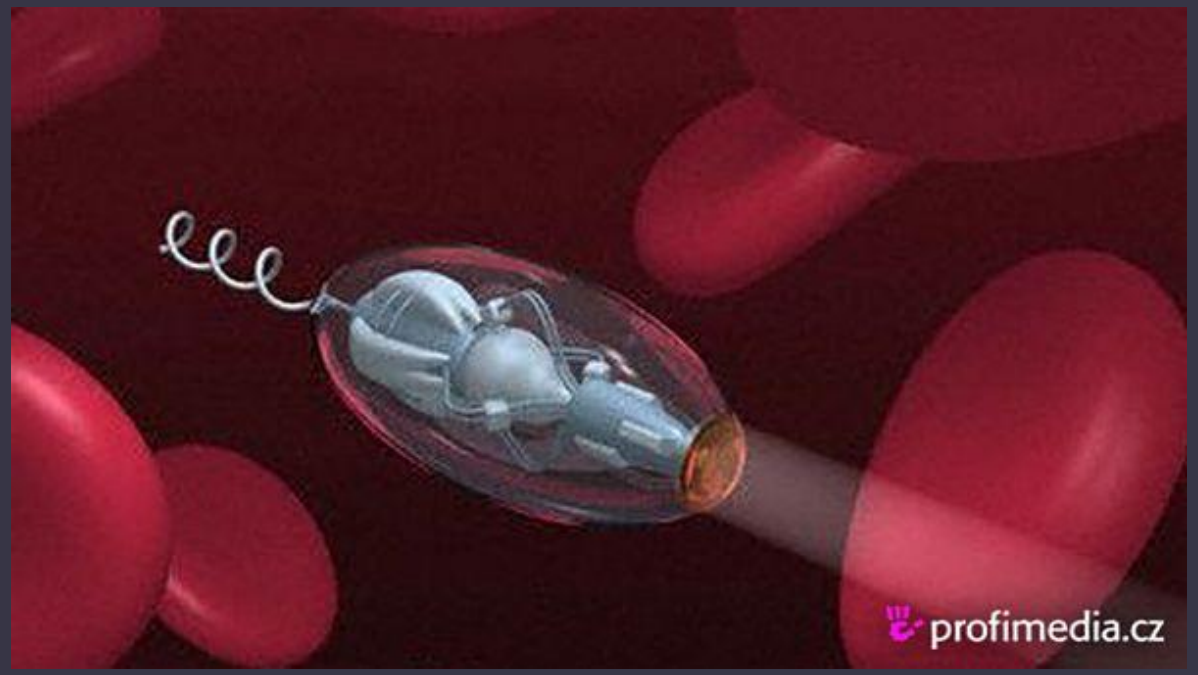
A typical medical nanorobot will have a micron size, allowing you to move through the capillaries, and consist (based on current views) of carbon.





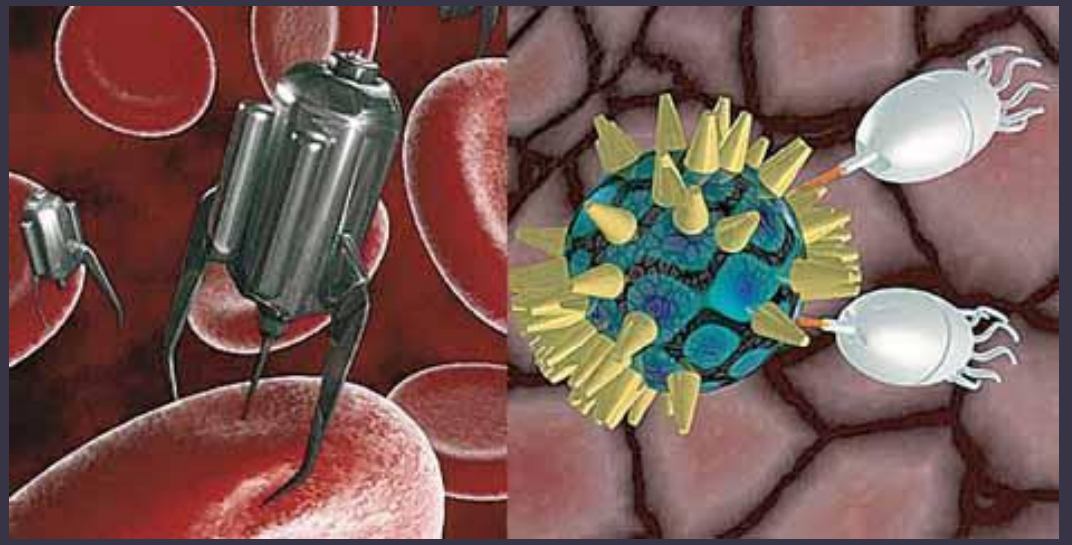


In addition to medical nanorobots, which exist only in the minds of scientists, a number of technologies for the nanomedical industry have already been created in the world.

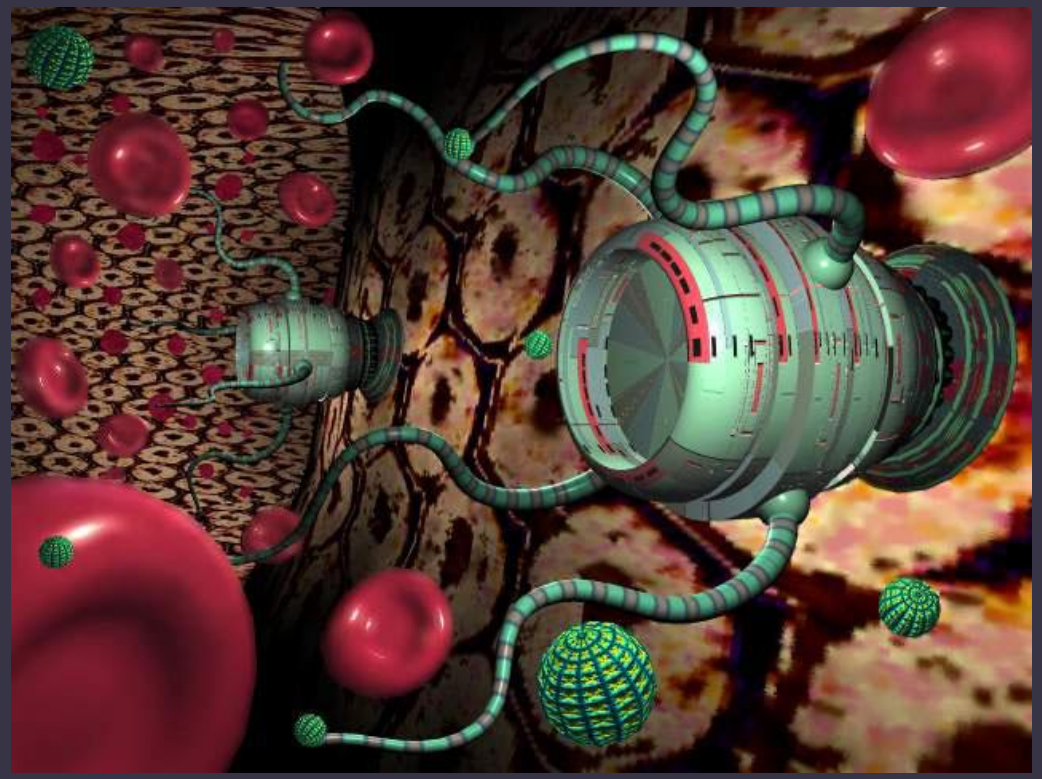


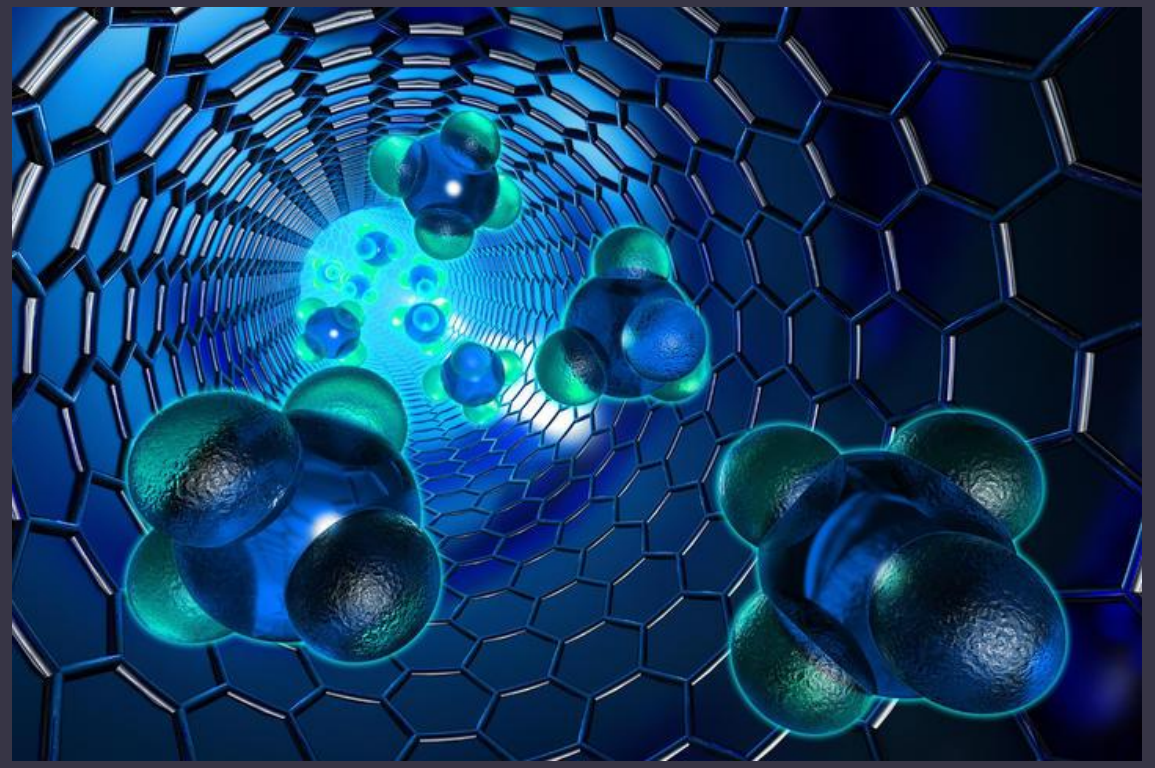
These include targeted drug delivery to sick cells, diagnosis of diseases using quantum dots, a lab on a chip, new bactericides, implants.

Thus, Nanomedicine is one of the actively developing scientific areas of medical science and implies - tracking, correction, genetic correction and control of the biological systems of the human body, at the molecular level, using nanodevices, nanostructures and information technologies.



- **Areas of application of nanotechnology are numerous. And the range of applications of these technologies increases day by day and promises many more interesting things. We can say with confidence that nanotechnology is the science of the future.**





Thanks for attention!