BRINGING BACK THE DEAD ONE TO LIFE (NANOTECHNOLOGY) Using NANOROBOTICS

MIRLANI KIRUTHIGA .R, VIGNESH .G
SETHU INSTITUTE OF TECHNOLOGY

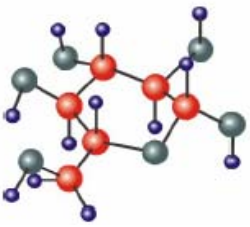
ABSTRACT

Nanotechnology is the engineering of functional systems at the molecular scale. This covers both current work and concepts that are more advanced. nanotechnology enhanced materials will enable a weight reduction accompanied by an increase in stability and an improved functionality. biomedical nanotechnology, bionanotechnology, and nanomedicine are used to describe this hybrid field. The prefix "nano" refers to one-billionth. When applied in the metric scale of linear measurements, a nanometer is one-billionth of a meter. The term "nanotechnology" is now commonly used to refer to the creation of new objects with nanoscale dimensions between 1.0 and 100.0nm Functionalities can be added to nanomaterials by interfacing them with biological molecules or structures. The size of nanomaterials is similar to that of most biological molecules and structures; therefore, nanomaterials can be useful for both in vivo and in vitro biomedical research and applications. Thus far, the integration of nanomaterials with biology has led to the development of diagnostic devices, contrast agents, analytical tools, physical therapy applications, and drug delivery vehicles.

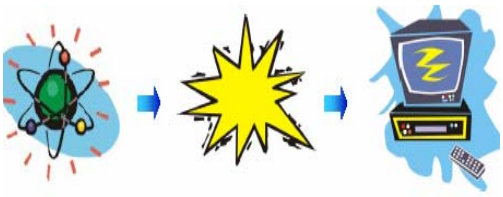
NANOTECHNOLOGY

INTRODUCTION:

You do remember that everything is made of atoms, don't you? A stone, a pen, a video game, a TV, a dog and you too are formed by atoms. Atoms build molecules or form materials.



Nanotechnology deals with the manipulation of atoms and/or molecules to produce materials, devices and even machines.



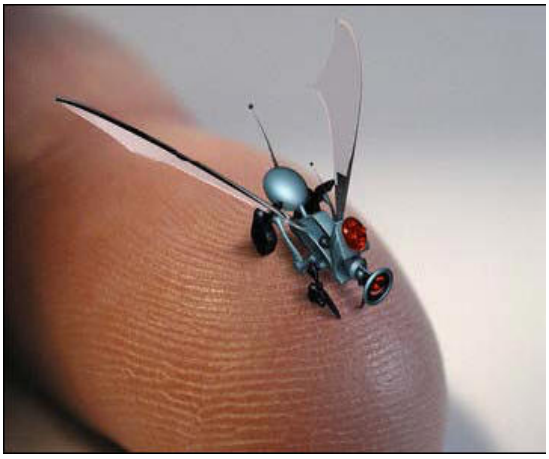
Ever since the first human beings started to "make things", we have started from "big things" (wood, stones, mineral ores) obtain or extract what we want. Now we want to start from "small things" (atoms and molecules), to assemble them and to obtain what we want. It's a bit like a children's game. A canoe was made from a tree…

Would you make toothpicks out of a tree trunk or wouldn't it be better to start from smaller particles?

Starting from "big things":

Means producing things with the precision that "we were able to achieve", but -at the same time producing lots of waste or pollution, and consuming a lot of energy. As we got better at technology, precision improved and waste/pollution diminished, but the approach was still the same.

Starting from "small things":Means absolute precision (down to one single atom !), complete control of processes(no waste?) and the use of less energy(with less CO2, less greenhouse effect, … perhaps you heard about that on TV).



Research into nanotechnology is a particularly challenging adventure. Many of the world's best minds are engaged in this.

Right now we can still do a few things: mostly in electronics, optics and material sciences, such as nano-particles, e.g. those in sun creams (do you use factor 8 or factor 20?). It's the amount of nano-particles that are inside to absorb the ultra-violet radiation that can burn your skin. In the future, possible applications are to figure out, such as:

- Measurements with one-atom precision;
- Sensors to detect dangerous substances;
- Electronics where we can use every single electron;
- Membranes for separations with very high precision;
  - Materials that change properties as we need them;
- Nano-machines;
  - Nano-robots that enter your body to clean or fix it.but we are only at the beginning. To achieve all this, we have to use our brains and optimise our efforts.

Some examples concerning materials:

Textiles that change propertiesas a function of needs,such as keeping you cool in summerand warm in winter; forks, spoons, dishes, pots, clothes,… that do not get dirty or wet - just like a lotus leaf when you pour a drop of water on it; materials that can fix your bones and teeth so that you cannot tell the difference; materials that are very resistant and very light to make cars, aircraft and space vehicles able to go on longer journey with much less energy consumption; and more in the future (just think that mobile phones did not exist only ten years ago!).

Materials with finer structure or smaller grains can be What do we need to progress faster ?skilled staff, brilliant students, infrastructures(laboratories, …),

instruments(microscopes, …), co-ordination of efforts and "critical mass", funds, and that people understand what we are trying to do !

By the way ... The prefix " nano" comes from the ancient Greekword for " dwarf". In science and technology it indicates thedimension of one billionth (and you know that e.g. the prefix "kilo" indicates one thousand). One nanometer is thus one billionth of meter (or one millionth of millimeter, etc.). It can be expressed as 10-9 meters and Shortened to nm. The radius of one atom of gold is 0.14 nm.

Half a nanometre is the linear dimension of a small molecule like methane methane (CH4). One human hairis around 100 thousand times bigger

The Meaning of Nanotechnology:

Much of the work being done today that carries the name 'nanotechnology' is not nanotechnology in the original meaning of the word. Nanotechnology is sometimes referred to as a general-purpose technology. That's because in its advanced form it will have significant impact on almost all industries and all areas of society. It will offer better built, longer lasting, cleaner, safer, and smarter products for the home, for communications, for medicine, for transportation, for agriculture, and for industry in general.

Imagine a medical device that travels through the human body to seek out and destroy small clusters of cancerous cells before they can spread or a box no larger than a sugar cube that contains the entire contents of the Library of Congress.

Or materials much lighter than steel that possess ten times as much strength.

NANOTECHNOLOGY – EMERGENCE:

NTs - huge potential in areas as diverse as healthcare, IT, food technology and energy storage.

Huge investment worldwide - $1 trillion/year by 2015.

Size: 100 nm

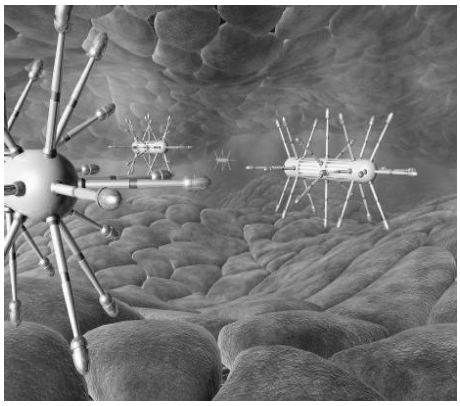
Form: spherical

Reflected colour

Medieval artists mixed silver and gold nanoparticles in different sizes as coloured pigments in stained glass .

MAKE DEATH COME INTO LIVE AGAIN:

Life is molecular machinery with atoms arranged in dynamic complex relationships, controlled by DNA. Using nanotechnology we build molecular assembler and change the genetic programming so that a person can live longer. Most of the deaths are caused due to heart attacks. Nanorobots are Nano devices that may be about 3 to 5 microns in size. If the person is dead due to heart attack we preserve him using cryonics and incorporate molecular assembler and nanorobots in his body, so that heart starts functioning again and the person can be relabeled as potentially alive.

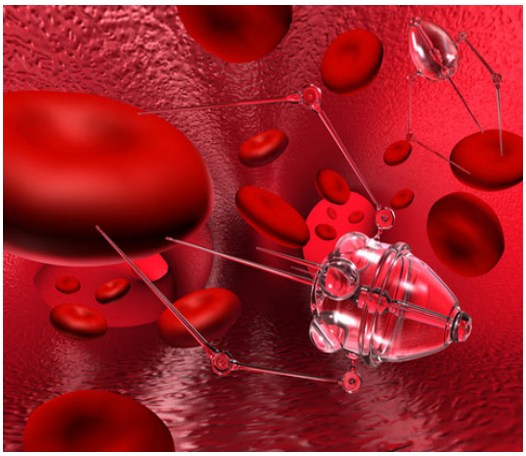


When a patient's heart stops beating, but before the structure of his brain starts to degenerate, the patient is attached to a heart –lung machine and progressively infused with 'anti-freeze' and other cellular stabilizers and then his body temperature is lowered until the patient is at 'liquid nitrogen temperatures'. At this point, all molecular change stops indefinitely and the patient is put in storage. By injecting the programmed nanorobots into the dead body which is being preserved by cryonics (freezing people for future), the nanorobots will make the coronary artery work so that the heart receives energy and it begins to pump again. Then the nanorobots will traverse towards brain simultaneously and make the brain to be active & in turn can also change the genetic behavior of the patient. Thus the person can be revived from death.

A parrot lives ninety years, a gecko one year and a Galapagos island turtle two hundred years. Why this difference? The genetic programming. Life is molecular machinery with atoms arranged in dynamic complex relationships, controlled by DNA. Using nanotechnology we build molecular assembler and change the genetic programming so that a person can live longer .If the person is dead we preserve him using cryonics and incorporate molecular assembler and nanorobots in his body ,so that heart starts functioning again and the person can be relabeled as potentially alive.

NANOROBOTS:

Nanorobots are Nano devices that may be about 3 to 5 microns in size. The Individual parts used to make those nanorobots may be of 1 to 200 nm in size, mainly Made of carbon, and may be given a coating of diamond. Which is the most inert and Toughest material ever known. These nanorobots can be used for variety of purposes. Here, to treat heart blocks we use three kinds of nanorobots.



What chemical elements would medical nanorobots be made of?

Carbon will likely be the principal element comprising the bulk of a medical nanorobot, Probably in the form of diamond or diamondoid/fullerene nanocomposites—largely Because of the tremendous strength and chemical inertness of diamond. Many other lights Elements such as hydrogen, sulfur, oxygen, nitrogen, fluorine, silicon, etc. will be used For special purposes in nanoscale gears and other components.

CRYONICS:

In cryonics –freezing people for future – scientists take patients who have been labelled as 'dead' by current medical criteria, replace their blood and much of their body water with chemicals to inhibit freezing dampage, and preserve them in liquid nitrogen at (-196 celsius).At that temperature all molecules in the body are locked in solids can no longer move around to react. Thus the individual can remain unchanged for thousands of years. It is possible that frozen patients will be repairable and relabeled as 'potentially alive' by using nanites. Cryonics is a technique designed with the intent to save lives and overcome illness and suffering.

RAISING DEAD:

'Absolute' death may only be said to occur when the brain's essential information is destroyed - and brain preservation is precisely what cryonic suspension aims to achieve. Cryonics is a matter of rational procedure, not religious miracle. Cryonics can't restore life to people whose brains have been long been physically destroyed Cryonics simply--but reasonably -- claims that if you freeze a person in a way that limits damage, then that person's brain structure may be preserved sufficiently to make it at least possible the eventual recovery of life and health. The oldest patient currently still being held in cryonic suspension is a Dr. James Bedford, who was suspended in 1967. He's survived the Cold War, the Vietnam War, the Gulf War, 60's race riots, the 70's recession, Watergate, and the

collapse of the Soviet Union - which is more than a lot of his contemporaries, can say.

NEURO SUSPENSION:

"Neuro" is short for neurosuspension, and it refers to the practice of removing and freezing only the head of a person declared legally dead. The theory is that only the information contained in the brain is of any importance, and that a body to contain the revived brain could be easily cloned or regenerated at some point in the future. Neurosuspension requires less space and maintenance.

Freezing human embryos has not only successfully taken place, it's now considered almost commonplace. Thousands of embryos have been successfully frozen since. Indeed, in one case, a human embryo was frozen at liquid nitrogen temperature for seven full years - and then brought to term, and is now a healthy young child.

Nanorobots in revival of dead: [DEATH OF DEATH] Nanorobots programmed to cure the damaged cells, bone marrow, and to make heart work again.

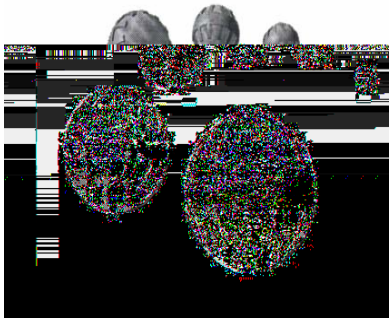


FIG: Respirocytes or artificial RBC

By injecting the programmed nanorobots into the dead body which is being preserved by cryonics, the fatal disease which caused death will be eliminated from the body first, and the nanorobots will make the coronary artery work so that the heart receives energy and it begins to pump again. Then the nanorobots will traverse towards brain simultaneously and make the brain to be active & in turn can also change the genetic. Behavior of the patient. Thus the person can be revived from death.

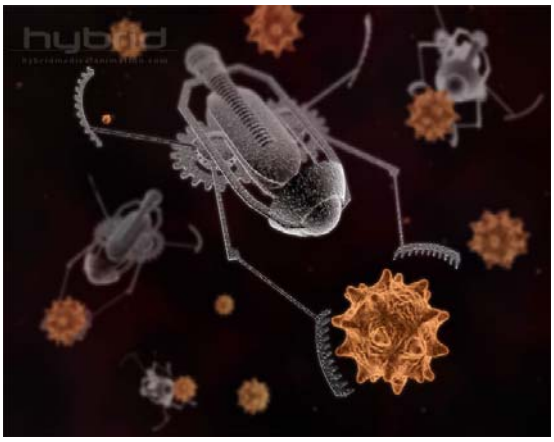
NANOSENSORS:

Nanorobots with nanosensors to locate the block. These robots will need four kinds of nanosensors.

- Pressure sensors
- Acoustic sensors
- Chemo sensors
- Smart sensors

Nanorobots equipped with nanolasers to serve the block after confirmation in order to prevent the recurrence of the block, molecular synthesis is carried out.

i.e. Nanorobot fills the burnt gaps with fresh flawless cells synthesized by the robots Themselves. This process is known as “molecular synthesis”



THE ACTUAL PROCESS:

Sensor robot that navigates other robots through the bloodstream:

All the three types of nanorobots needed for the process, are suspended in a liquid matrix and injected into blood vessels of the patient.

Acoustic sensors in sensor robots get activated soon and begin navigating the army of robots through the blood stream to the pericardium.

Simultaneously, the smart sensors present in the sensor robots, get activated and form a closed ad-hoc network connecting all the robots

. This is very essential in order to guide all the nanorobots to the desired location.

SOPHISTICATED METHOD:

The most sophisticated type of diagnosis is done here by the sensor robots, i.e. Diagnosis inside the human body. These sensors, on reaching the periphery of the heart, Scan the pericardial vessels, for blocks and locate the spo texactly.

PRESSURE SENSORS:

The pressure sensors mounted on the sensor robots, scan the blood vessels for variation in the blood pressure these sensors will generate a report of the potential areas of heart Block, based on the pressure mapping of the blood vessels

CHEMO SENSORS:

These sensors scan the region they traverse, for the chemical composition of the cholesterols. That is, these sensors differentiate the cholesterol compounds accumulated on the walls of the blood Vessels, from the actual composition of the tissues of the blood vessels. In this way, the block can be Identified accurately.

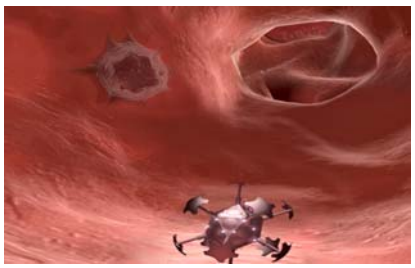
SMART SENSORS:

All these information are transmitted through the ad-hoc network formed by all the smart sensors and can be constantly viewed by the doctors monitoring the entire process.

After successful location of the block, the second type of nanorobots, those equipped with nanoscalars, come into picture.

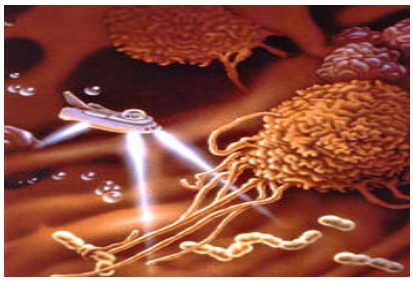
These lasers, like the robots themselves, can be powered by the body itself, by means of the kinetic energy of the flowing blood, pressure of the blood flow, etc. thus these lasers can be powered by the most ingenious ways imaginable.

These laser robots on activation based on the information flow through the network, effectively burn down the block. Since the operation is held on a nanoscale, the outcome is highly accurate. Moreover, there is literally no damage to the surrounding tissues.



MOLECULAR SYNTHESIS

These nanorobots, take the required biochemical substances from the blood or the Surrounding tissues, and synthesize the cells of the blood vessels in order to seal the Area of the block. These cells are placed in the affected region and as a result, we Have a whole new region of the blood vessel that is completely free from the threat of Another block.



ADVANTAGES:

- It is possible that the frozen people will be repairable and relabeled as potentially
- alive.
- Life extension.
- Super medicine for fatal disease.
- Disadvantages:
- Population will be uncontrolled.
- Cryonics can't restore the life to the people whose brain has been physically destroyed. Practical implementation is quite difficult &expensive.

APPLICATIONS OF NT:

- High strength composites
- Multifunctional materials
- Plastics with enhanced properties
- Body armor, space suits
- Enhanced semiconductors
- Transparent zinc oxide – sunscreen.

CONCLUSION:

Nanotechnology offers important new tools expected to have a great impact on many areas in medical technology. It provides extraordinary opportunities not only to improve materials and medical devices but also to create new "smart" devices and technologies where existing and more conventional technologies may be reaching their limits.

REFERENCE:

1959–Richard Feynman – American physicist &Nobel laureate – 'There's plenty of room at the bottom'. 1974 "Nanotechnology"coined by Japanese scientist Norio Taniguchi.