ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 04, pp.29415-29417, April, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

NANOTECHNOLOGY- RESHAPING CRYONICS FOR LIFE EXTENSION AND RESURRECTION

Anirudh and *Dr. Puneeta Ajmera

[1]Department of Electronics and Communication, Dronacharya College of Engineering, Gurgaon
[2]Assiatant Professor-II, Amity Medical School, Amity University, Gurgaon

ARTICLE INFO

Article History:
Received 23rd January, 2016
Received in revised form
17th February, 2016
Accepted 20th March, 2016
Published online 26th April, 2016

Key words:

Cryogenics, Cryonics,
Heart Failure, Resurrection,
Nanotechnology.

ABSTRACT

Cryogenics is defined as the study of the production and behavior of an object at extremely low temperatures below -150°C and -240°F. This paper is about cryonics and it is very important to understand the difference between Cryonics and Cryogenics. So, as mentioned above Cryogenics is related to the study of materials at very low temperatures. But on the other hand cryonics deals with the keeping of a human body at extremely low temperatures. The idea of cryonics was first proposed in 1962. The Cryonic procedures start immediately after the heart failure of a person who has asked for cryopreservation of his corpse. However, it is illegal to perform cryonics on a person who is alive and that would be regarded as a murder or suicide. Cryonics can preserve a human body for a long time till some revival technique is developed in future. But there's only one technology available to us today which can help in resurrection of a person who is legally dead in future. This is the Nanotechnology that can make it possible. But how can it be achieved by nanotechnology, that is discussed in this paper.

Citation: Anirudh and Dr. Puneeta Ajmera, 2016. "Nanotechnology- Reshaping Cryonics for Life Extension and Resurrection", *International Journal of Current Research*, 8, (04), 29415-29417.

INTRODUCTION

Cryonics can be defined as the preservation of animals and humans having an incurable disease at extremely low temperatures. It is done with a hope that a revival technique will be available in future and the resurrection of those humans and animals will become possible. The keeping of a human body at low temperatures in order to preserve them for future is called Cryopreservation. However, it is illegal to perform cryonics on living persons as it would be considered as a murder. It can only be performed on a person who is legally dead. The term legally dead is different from completely or totally dead. If the heart of a person stops beating, the person would be pronounced legally dead. At this state, some part of the brain will still be in functioning for some time. And when the functioning of the brain also goes off, only then a person would be announced totally dead. So, minutes after a person is announced legally dead, a team of experts would be ready to perform cryonics on that person before he is totally dead.

How it is performed

Minutes after a person that has signed for Cryonics is announced legally dead, the company providing cryonic services takes over. An emergency team gets to work immediately. The body of the person is stabilized by supplying sufficient blood and oxygen to the brain of the person. This is done in order to preserve the minimal functioning of the brain till the body is transported to the suspension facility. First, the body is packed with ice. Then some anticoagulants are injected in order to prevent blood clotting. After all these processes, the cooling or freezing of body is initiated.

What is nanotechnology

Nanotechnology or nanoscience is an engineering and science conducted at the nanoscale. The nanoscale maybe ranging from 1 nm to 100nm. Basically, nanotechnology is the study of materials whose size is extremely small and lies within the nano range. This technology is very versatile and can be used in many fields such as chemistry, physics, engineering, material science and medical sciences. Due to a variety of potential applications of nanotechnology including military and industrial applications, many countries have shown deep interest in it and have invested billions of dollars in the research studies related to nanotechnology. USA tops this list of countries with an investment of 3.7 million dollars so far. Then comes the European Union with an investment of 1.2 billion dollars followed by the Japanese with an investment of

Corresponding author: Dr. Puneeta Ajmera
Assiatant Professor-II, Amity Medical School, Amity University Gurgaon.

750 million dollars. There have been many debates on the future implications of nanotechnology. Using nanotechnology, it is possible to create many new materials and devices with a wide range of applications such as electronics, biomaterials and medicine. The concept of nanotechnology was first discussed in 1959 by famous physicist Richard Feynman in his debate in which he described the possibility of synthesis through direct manipulation of atoms. The term "nanotechnology" was first proposed by Norio Taniguchi in1974.

Fundamental concepts of nanotechnology

Nanotechnology can be considered to be the engineering of a functional system at the molecular scale. This includes the highly advanced concepts as well as the current work. In other words nanotechnology refers to the projected ability to make items from the bottom up using the techniques that are being developed today to make the products having higher performances. One can imagine how small the nanotechnology is from the fact that one nanometer is equivalent to one billionth of a meter. i.e 10^{-9} meters. There are 25,400,000 nanometers in one inch and even the thickness of a paper could be around 100,000 nanometers. Nanotechnology provides us the ability to see and control the atoms and molecules. Everything on earth is made up of atoms. So using nanotechnology, one can closely observe the structural activities of almost anything on earth including human cells and tissues. The areas of physics like nanoelectronics, nanophotonics and nanomechanics are also evolved from the nanotechnology.

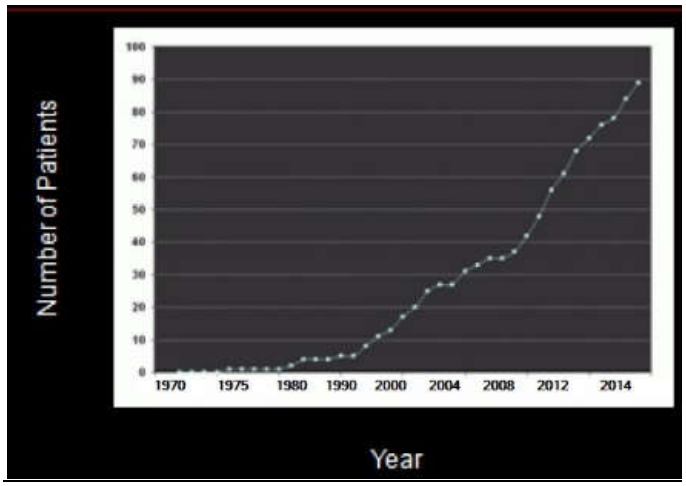
How it can be useful in cryonics

There is only one cause behind aging and death. For some reasons, both aging and death occur due to the movement of atoms and molecules in our bodies from their original positions and other atoms and molecules move into those positions and take that space. And since nanotechnology deals with the study of atoms and molecules it can prove to be helpful in extension of human life. The self-replicating biomedical nanotechnology may prove to be helpful in achieving the revival from the process of cryonics. There is a physical barrier in the containment of self-replicating biomedical nanotechnology to prevent the movement of self-replicating nanobots beyond a containment zone.

Why we need self-replicating biomedical nanotechnology in cryonics

In cryonics, an individual is neither living nor dead and his body is brought down to such a low temperature that there will be a very small amount of degradation of the body cells and tissues. This degradation is assumed to be negligible. In future, it will be possible for the nanobots to burrow into a frozen human body. And if they can burrow the human body, they can repair the damage caused by the freezing and thus they can cure the illness and after de-freezing the body, the individual can be brought back to life. It may be noted that it requires a large number of nanobots. This is because a human body consists 23 billion red blood cells alone. So, a large number of medical nanobots can initiate an inflammatory reaction. As the body starts to come back to life, billions of new cells will be created. Many of these new cells may need to be repaired and they are treated by the nanobots. In order to be more effective, these nanobots need to replicate and interact the cells at the same rate with which cells replicate and interact. To ensure the health of billions of cells, the nanobots need to self-replicate as autonomously as do those billions of cells.

Increasing demand of cryopreservation



With time people are being rational and they believe the tremendous developments in the field of technology and medical sciences have proved to be very crucial and they can rely on technology for their future. It is obvious from the fact the graph of people opting for cryonics has shown an unimaginable rise over the past few years. It may be noted that during 2013-14, about 270 people have asked for cryopreservation with a hope of revival in future.

Unreliability

Many people believe that the companies offering cryonics facilities are just luring the customers with a dream of immortality and they'll never be able to revive those who undergo the cryonics treatment. Apart from that we can't deny the fact that till now, there haven't been any single revival of those who have been in cryosleep for years. But scientists are hoping to get success in the revival of cryonics patients within next 20-30 years. The biggest hurdle with revival is that the warming process has to be done very carefully and with a controlled rate and controlled temperature. Otherwise the cells can form liquid crystals and they would shatter eventually. Moreover, the procedure is very expensive and it costs over $200,000 to have your body preserved.

Acknowledgment

We hereby acknowledge all the below mentioned writers and websites for providing us the valuable information on this topic and helped us to study this topic thoroughly before start writing this paper.

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