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THE LIFE AFTER DEATH: CRYONICS

[1]N. TEJASWINI, [2] G. SONIYA PRIYATHARSINI,

[1]Undergraduate Student, Department of Computer science and Engineering, [2] Professor, Department of Computer Science andEngineering,
[1]Department of Computer science and Engineering,
[1]Dr.M.G.R Educational and Research Institute, Tamilnadu, India.

Abstract: Cryonics is the process of bring the dead back to alive. Deductively Cryonics is the act of saving life by stopping the perishing system by subfreezing temperatures with the plan of re-establishing great wellbeing with clinical innovation in future. Cryonics is an endeavor to safeguard and safeguard human existence, not converse demise. It is the act of utilizing outrageous cold to endeavor to safeguard the existence of an as of now not be upheld individual by the present medication**.** [1] future medication, including mature nanotechnology, be able to recuperate at the cell and atomic levels? Would cryonics be able to effectively bring the cryopreserved individual forward through time, for notwithstanding what number many years or hundreds of years may be essential, until the cryopreservation cycle can be switched and the individual reestablished to full wellbeing? While cryonics might seem like sci-fi, there is a reason for it in genuine science. The total logical story of cryonics is only from time to time told in media reports, leaving cryonics generally misconstrued. We welcome you to arrive at your own decisions.

Index Terms **- Component, formatting, style, styling, insert.**

I. INTRODUCTION

Introduction:

Cryonics is gotten from the Greek word "kryos" and that signifies "cold". The course of cryopreservation starts in the extended period of 1954 to human cells with frozen sperm, defrosted and used to inseminate 3 ladies. [2]Cryonics is available by and by which includes the conservation of dead assortments of individual and creatures at exceptionally low temperatures called as cryonic temperature by having a confidence in future science to re-establish them to solid day to day environment. In present times cryonics is performed solely after the announcement of legitimate demise of the cryonic subject. By the use of cryoprotective specialists, the freezing conduct of cells gets contrasted and influences the pace of water transport, nucleation, and ice gem development.

Cryonics idea depends on a few key ideas like:

1. At low temperatures, synthetic responses in body can be halted for a long time.
2. By the utilization of vitrification blends, ice development is diminished.
3. Demise is a cycle, not an occasion; it invests in some opportunity to get passing irreversibly.
4. The harm that is brought about by the clinical demise and low temperature will be turned around in the future however not presently. In cryonics, the people are cooled at a temperature underneath - 120°C to safeguard tissues with little changes in tissue structure after heart failure. [3]The freezing procedure has been deductively proposed in people by Michigan teacher "Robert Ettinger" and stated "The possibility of eternality" Essentially to the cryonic individual, breath and dissemination are re-established precisely and quickly cooled to a temperature of 10°C and 0°C. Later the blood of individual is taken out, and cryoprotectant combination is supplanted to stop ice arrangement. Presently the body is cooled to -120°C.

Cooling:

After deceleration of death the cryogenic subject is kept in a bath of water for initial cooling from human body temperature of 37°C to 10°C. It involves convection effect. Cryonic subjects' temperature is cooled by the process of convection, combination of conduction and fluid motion. [4]The people who go against the methodology of cryonics says that there is no essential hindrance, when the construction of mind stays in salvageable shape, which get the actual regulation, and recuperate its data content. Cryonics expresses that an individual can live without initiation of the mind, which is seriously harmed. In current innovation, by utilizing the best techniques, the cryopreservation of the total body or mind of the cryonic subject gets harmed and irreversible. Cryonic supporters express that as of now non-existent nanotechnology will assist with getting back the existence of a dead individual later

on and treat the infection on account of which the subject kicked the bucket. [5]The course of psyche transferring is likewise given. [6]The first cryonic body to be safeguarded by freezing was "Dr. James Bedford" in 1967. In 2015," Du Hong" (61years) who is a female author of youngsters' writing, is the main Chinese public to protect her head. Till 2014, around 250 cryonic subjects are cryopreserved in U.S, and around 1,500 had set up for safeguarding their bodies.

OPERATION OF CRYONICS:

In light of the various sorts of cells of mammalian species, there is wide changes in cryobiological reaction and cryo endurance during freezing and defrosting cycle. The course of cryopreservation is by various techniques:

1. Slow freezing
2. Vitrification
3. Sub-zero non-freezing storage
4. Preservation in a dry state.

Important Steps Involved in this process are:

1. Before cooling, mixing of CPAs with cells and tissues.
2. Storage of cells and tissues after cooling them to low temperatures.
3. Warming of cells (or) tissues
4. After thawing, CPAs are removed from cells and tissues.

It is intriguing by and by to diminish ischemia or reperfusion injury by pretreatment in cryonic subjects. Decrease in blood coagulating can be gotten with the pre-treatment of vitamin E in the cryonic subjects, yet it may not cause any gastric draining as like headache medicine. Sedation diminishes cerebral digestion, forestalls blood coagulating, increment pulse, settles pH against acidosis, and safeguards against ischemia are kept up with once after the event of heart failure. During the cryonic strategies to keep cells and tissues alive, blood flow and breath are re-established. It is known as cardiopulmonary help (CPS) than cardiopulmonary revival (CPR). [7]To forestall revival, Propofol (2,6diisopropylphenol) is utilized for its calming activity, which can likewise act a neuroprotective . Brain cell apoptosis, which is because of ischemia, can be repressed by the utilization of propofol Blood thickening is forestalled by utilizing Heparin. Streptokinase goes about as a thrombolytic and THAM (trishydroxymethyl aminomethane), which is a support that keeps up with blood vessel pH and crosses cell film by keeping up with intracellular pH by diminishing CO2 creation. [7]Cryonics subjects are put away in canteen bottle-like holders of fluid nitrogen. The Process of Cryonics for the most part includes two Methods; they are: • Cryogenic storage and

• Vitrification Cryogenic storage includes the usage of high concentrations of CPA's to completely stop ice formation. Vitrification is the most common way of cooling and cementing without arrangement of gems.

Method-1: Cryogenic Storage:

By utilizing anti freezing intensifies like Cpa's, the act of cryonics diminishes the development of ice in cryonic subjects. In 2007, the development of ice is wiped out by involving vitrification arrangement in the mind, yet not in different organs and tissues by major cryonic associations. The cryoprotectants that are regularly utilized in the methodology are Dimethyl sufoxide (DMSO); Polyol's ethylene glycol (Automobile liquid catalyst); Propylene glycol (To diminish ice precious stones in frozen yogurts); Glycerol (Used to save sperm and platelets); 1,2-Propanediol; 2methyl-2,4 pentanediaol and polymers, for example, polyvinyl pyrrolidone; proteins; cell financier series; trehalose; proline; mannitol; sucrose. [6]This multitude of mixtures have capacity to shape hydrogen bond with water and forestall arrangement of ice. Combination of cryoprotectants is less poisonous than unadulterated CPA's and take out ice arrangement completely. To forestall ice development, low convergences of CPA's are utilized permiting the quick cooling. The harmfulness of cryoprotectant contrasts conversely with temperature. The harm caused to cells because of CPA's is irrepairable. Because of lack of hydration and poisonousness of cryoprotectant arrangement cell harm happens.

Method-2: Vitrification:

Vitrification is the most common way of hardening to a polished state, which is not the same as gem type of ice of vitrous strong. The best models incorporate "Golden". By sluggish cooling at 3million kelvins each second, unadulterated water can be vitrified. Quick cooling of sucrose during vitrification shapes a "COTTON CANDY" though "ROCK CANDY" is framed on sluggish cooling. The rewarmed cuts of the ultrastructure of CA1 tissue of hippocampal was all around safeguarded that the ordinary ultrastructure of CA1 area. Till the immersion point is acquired, cerebrums are taken into the vitrification arrangement by cryogenic associations. A review is directed on hare kidney, which was vitrified; cooled to a temperature of - 135°C; once more, re-warmed. This kidney is relocated to an ordinary living hare.[5] It shows extremely powerful capacity as like the ordinary kidney and makes the hare to make due. "M22" is the vitrification combination used to safeguard hare kidney. M22 likewise helps in protecting the ultrastructure of cerebrum in hares without development of ice. To forestall ice development quick cooling is performed from 0°C to 130°C. Further cooling to the temperature of - 196°C from - 130°C prompts breaking and cracking on account of warm pressure and enormous strong vitrified examples. To stay away from this course of cooling ought to be slow.
Commonly used vitrification methods are;

- Straw method
- Open pulled straw method
- Glass/quartz capillary
- Cryo-loop and
- Electron microscopy grid.

To check reasonability of cells intracellular
K+ or Na+ proportion technique is regularly utilized. Different techniques incorporate intracellular ATP content estimation. To eliminate the extracellular particles "Mannitol" is utilized, and the tissues are set in mannitol arrangement. It is expected to play out the intracellular K+ or Na+ proportion. To crack the cell film "Trichloroacetic corrosive" is utilized, and afterward the intracellular particles are delivered out. To observe the overall groupings of K+ and Na+ particles, fire photometer or nuclear retention spectrometer are utilized.

RESEARCH ON RABBITS:

Interestingly, researchers say the itemized design of a completely unblemished mammalian mind has been cryogenically protected. While the safeguarded cerebrum was dead tissue, its synaptic associations in general or the intersections of nerve cells were kept up with, Robert McIntyre, a researcher at organization 21st Century Medicine who drove the exploration, told The Huffington Post. "This examination is a first since it deals with entire cerebrums and jelly the entirety of the synaptic subtleties," he said. "Past strategies, for example, pitch implanting, are simply ready to protect itemized synaptic data in little cerebrum cuts." To be sure, since the 1960s, researchers have been safeguarding little examples of mind tissue at this degree of detail, yet they haven't had the option to protect a whole cerebrum as of not long ago, as indicated by the BPF. [5]"The cerebrum had the option to be cut and seen in an electron magnifying lens which recommended that every one of the associations had been saved," Dr. Michael Cerullo, a therapist at the Virginia-based establishment, told Newsweek. To protect the hare mind, the scientists utilized another substance procedure called Aldehyde-settled cryopreservation, or ASC, that elaborate the blend of cycles called compound obsession and cryogenic cooling.

In the first place, the slick fluid glutaraldehyde was utilized to tie the proteins in the mind together, McIntyre said, and afterward ethylene glycol, a strong liquid catalyst utilized in the car business was utilized to shield the cerebrum from the super virus. Then, the analysts cooled the mind to - 135 degrees Celsius (or - 211 degrees Fahrenheit), making it harden into a glasslike state. "Ice precious stones never structure on the grounds that the ethylene glycol totally represses ice gem development," McIntyre said. "At - 135 degrees Celsius, the mind can be put away for a really long time minus any additional rot." At the point when the organ was rewarmed, cuts of it were inspected, as indicated by BPF. "Each neuron and neurotransmitter looks delightfully protected across the whole mind. Absolutely astonishing given that I grasped this exact same mind when it was vitrified shiny strong," BPF president Dr. Kenneth Hayworth said in an explanation. "This isn't your dad's cryonics." McIntyre and his partner Dr. Gregory Fahy, VP and boss logical official at 21st Century Medicine, were granted a $26,735 prize from BPF in the wake of exhibiting the ASC strategy.

The organization noticed that ASC isn't a strategy for suitable cerebrum safeguarding, yet might be utilized as a device by neurobiologists to store uncommon or important mind material for endless timeframes. "This is a procedure intended for use by neuroanatomists to more readily concentrate on mind structure," Fahy told The Huffington Post. "This is the main strategy that impeccably safeguards the construction of a whole cerebrum with the end goal that, not at all like ordinary techniques, each and every piece of the mind can be concentrated exhaustively to develop an image of the whole mind." A few researchers see this examination not just as a better approach to additional review the mind's wiring, yet additionally as a stage toward perhaps saving human cerebrums to keep up with memory.

"I believe that ASC could ultimately lead the best approach to saving recollections in human minds. In any case, involving it for something major like that requires proportionately large proof to help it," McIntyre said. "It's significant overall in light of the fact that the degree of detail that is protected with ASC may be adequate to safeguard every one of the recollections of a singular mind," he added. "This is something that should be painstakingly talked about by the neuroscience local area."

Different researchers, be that as it may, still have doubts. "It's critical to ponder what condition these organs are in after they've been thawed out for some time," Dr. Hans Bozler, cryogenics master and material science teacher at the University of Southern California, told The Huffington Post. "Having protected organs seem typical is a longways from being completely utilitarian."

Applications:

Cryopreservation is applied in different areas:

1. Cryopreservation of cells or organs.
2. Cryosurgery.
3. Biochemistry and molecular biology.
4. Food sciences.

5. Ecology and plant physiology.
6. Medical applications like blood transfusion; bone marrow transplantation; artificial insemination; in-vitro fertilization.
7. Cryopreservation of oocytes and embryos; sperm, semen, testicular tissue; stem cells; hepatocytes.
8. Preservation of fertility cell therapies; reproductive medicine regenerative medicine; blood preservation and handling of organs prior to transplantation.
9. Long-term preservation of animal and plant cells along with the genetic material of endangered species.

CONCLUSION:

In conclusion, cryonics is a controversial and speculative field of research with the potential to extend human life beyond current biological limitations. While the concept of preserving individuals at extremely low temperatures until future medical advancements can revive them is intriguing, it remains unproven and faces numerous scientific, ethical, and logistical challenges.

Key takeaways from this research paper include:

Scientific Uncertainty: Cryonics is not yet supported by rigorous scientific evidence. The preservation and revival of complex biological systems, especially the human brain, are far from being realized, and many questions remain unanswered.

Ethical Considerations: Cryonics raises profound ethical dilemmas, including concerns about consent, resource allocation, and the potential for unequal access to this technology.

Cost and Accessibility: Cryonics procedures are expensive, limiting access primarily to those with significant financial means. This raises equity issues related to who can benefit from such technology.

Legal and Regulatory Challenges: The legal framework surrounding cryonics is complex and varies by jurisdiction. Clarity in legal and regulatory aspects is crucial as the field evolves.

Future Prospects: While cryonics remains speculative, ongoing research in related fields like organ cryopreservation and neurobiology could lead to breakthroughs that benefit both cryonics and other medical applications.

Despite these challenges, cryonics has potential future prospects. Research in related fields, such as organ cryopreservation and neurobiology, may lead to breakthroughs that not only benefit cryonics but also have broader medical applications. Improved understanding of cryoprotectants and the development of more advanced cryopreservation techniques could have implications for organ transplantation and the preservation of tissues for medical research.

In summary, cryonics remains a subject of scientific curiosity and ethical debate. While it captivates the imagination with the promise of potential immortality, it is essential to approach this field with caution and to continue exploring its scientific, ethical, and societal implications. Further research and collaboration across various disciplines will be necessary to determine the feasibility and ethical boundaries of cryonics in the future.

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