Cell Biology

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Abstract

Cellular replication, cloning and the relationship between DNA molecules, functioning cell and a complete working body

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The purpose of my project is to identify relationship between cloning a cell using DNA molecules, determine the relationship between DNA molecule and a fully functional organism. My research include a brief summary of molecular cloning, reproductive cloning, obstacles and problems scientist have to face during research, technological benefits in the future, information about molecular science and biotechnology, relationship between a DNA molecules, functioning cell and a complete working body

This study uses DNA molecules to create a fully functional cell and use information in the nucleus for reproductive cloning. Furthermore my research clarify the understanding of molecular science and biotechnology and simplify the relationship between DNA molecules and a fully functional cell.

The results of this analysis can be used to understand more about development of future technology, human anatomy. This data can be used for planning ahead and reduce any errors or problems that could cause during or after Luna Mission One.

Methodology

For my research I used information obtained through internet and the library as a guide.

My research discuss the ethical and scientific problems that could effects cell biology furthermore this project simplify and summarise many complex techniques in cell biology.

Introduction

Cell biology analyse life and living organisms from a cell to a complete working body. Many divisions of biology have much to tell us about what is the human body is made up of, how it works, and how it's affected every aspect of the world around us. Biology as a whole is one of the vital element of all forms of modern healthcare, from simple painkillers to life saving drugs. Additionally biology play an essential role in protection and welfare of all living organisms.

Learning objective of my project:

Cell biology

On first hearing about LM1 and its archive with DNA, many people imagine themselves being recreated in the future. What is the actuality - what is possible under the laws of science and the capabilities of technology? How might molecular science and bio-technology each develop over time - in decades, in centuries, or longer? What is the relationship between a DNA molecule, a functioning cell, and a complete working body? Even if it is possible to "join the dots" and understand the dependencies between these three levels, what are the external dependencies for it all to work?

My objective is to understand and research the topic I chose from the public interest issue document. I chose cell biology for my research. Foundation of my research is based on biology as an advance level student I have clear understanding about human biology, molecular cloning and anatomy of human body.

Some of the information in my projects are obtained through varies sources such as internet and books. My report will pay particular attention to anatomy of human body and particular components such as cells, cellular replication and molecules of the human body.

Creating Cells Using DNA Molecules

Molecular cloning allow to reconstruct a living cells using DNA

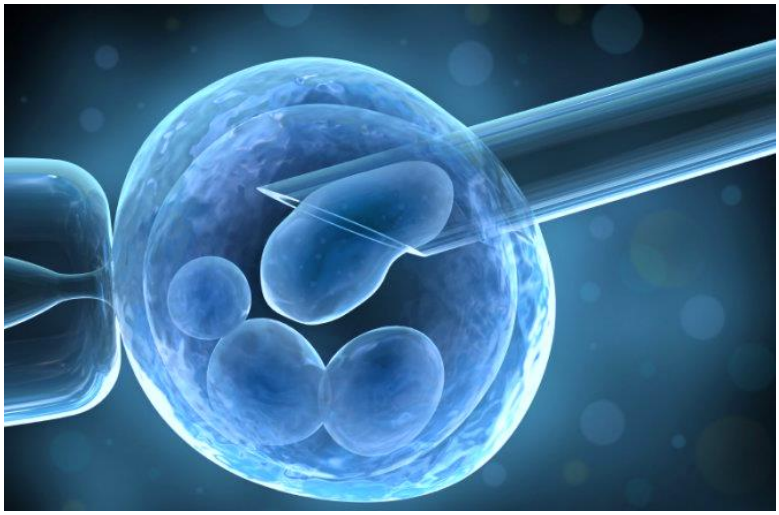
Molecular cloning isolate DNA sequence from any part of the body (skin tissue, hair strand). Once isolated, molecular clones can be used to create many copies of the DNA for study of the gene sequence and express the resulting protein for further analysis.

Future of molecular cloning

Molecular cloning has advanced from the cloning of a single DNA fragment to the assembly of multiple DNA. New and emerging technologies could transform a DNA molecule to a fully functional cell and possibly a fully functional organism.

Is it possible to recreate a human?

Theoretically it is possible to recreate a humans. This process implicate reproductive and molecular cloning. However this process very intricate due to ethical and scientific problems.



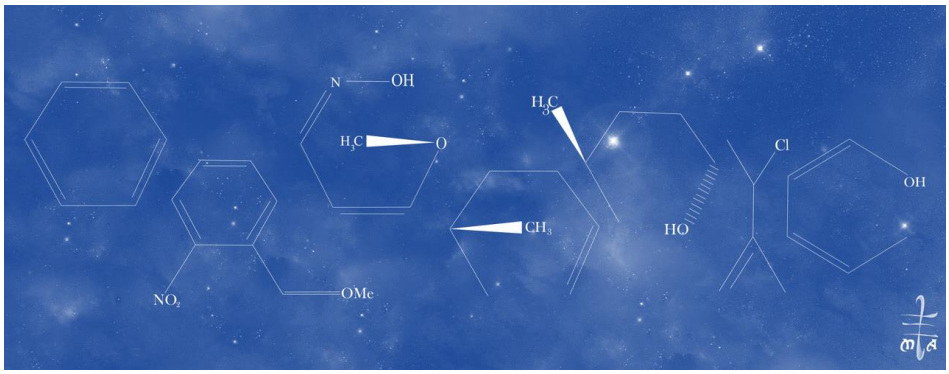
Regardless scientists being able to clone humans from a fully functional cells, it is still unlikely to produce a cell from a DNA molecules due to many scientific and technological obstacles

The science behind human cloning: How far are we and what are the possibilities under the laws of science

Ethics and legality of human cloning are still blurry however the science behind the idea is clear. It is possible to clone a fully functional human using cells.

However there are many risks and problems such as a high failure rate and low genetic diversity.

Scientists have already cloned human embryos and many believe creating fully developed humans is the next stage. Science fiction imply the simplicity and risks of cloning however the reality is far more complex.



Process

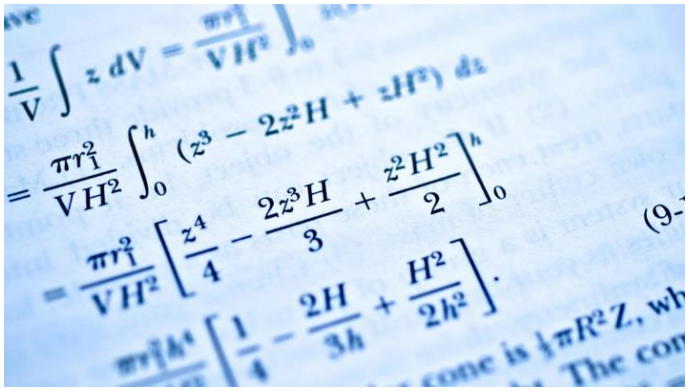
Cloning represents a variety of processes used to construct genetically identical copies of a biological organism. This process allows organisms to have exact genetic copies, every single DNA in the organism is identical. Cloning can occur naturally, identical twins, plants and some bacteria are one of the very few examples.

There are two ways to make an exact genetic copy of an organism, artificial embryo twinning and somatic cell nuclear transfer.
Cloning animals is not new in science, with the first animal, a tadpole, being cloned in 1952. In 1996.

Dolly the sheep became the first mammal to have been successfully cloned born. In 2014 scientists were able to clone adult stem cells, this is a huge breakthrough for therapeutic cloning research.

Is It Safe?

Theoretically it is possible to clone humans, but there are no records of a fully developed human ever being cloned. Scientists have accomplish in creating human clone embryos from the skin cells of both infants and full grown adults. However, none of these embryos were allowed to mature fully.



Regardless scientists being able to clone humans, it is still unlikely due to ethical reasons. Furthermore cloning has a high failure rate and cloning reduce genetic diversity within organisms.

Future of Human Cloning

The legalities on human cloning differ around the world for legal reasons as well as ethical reasons. Although the science is exciting, it will likely take many decades of research before scientists are able to create a fully developed human.

Disadvantages

Even if it is possible to clone human it is still impossible to transfer consciousness between two organisms.

What is Molecular science and Bio technology?

Molecular science is a category in science regarding biological activities at the molecular level. Area of molecular science overlaps with biology and chemistry and in specific, genetics and biochemistry. A key area of molecular science involve understanding how various cellular systems interact in terms of the way RNA, DNA and protein synthesis function.

Biotechnology is based on biology. Biotechnology utilize biomolecular and cellular processes to develop technologies and products that help to improve our environment and lives.

Modern biotechnology contribute breakthrough technologies and products to battle diseases, help our environment, reduce global warming and hunger increase the usage of renewable energy to maintain cleaner, safer environment for organisms in our planet.

Development of Molecular Science and Bio technology

Genetics, cell biology and molecular biology are central to all Bio technology fields. These areas have been enlightened by the wealth of information emerging from the many ongoing projects. Major areas of research and development in biotechnology and molecular science are maturing at a rapid rate, and may soon converge with one another. Much of progress in the future is likely to result from advances in personalized medicine.

Biotechnology and molecular science is revolutionizing the diagnosis of diseases. New experiments can detect changes in the DNA sequence of genes reduce risks and can predict the likelihood that a patient will develop a disease.

Advances in DNA technology are the essential to the development of new medicines and to increase our understanding about organisms. The practice of medicine has changed dramatically over the years through pioneering advances in biotechnology research and molecular biology. Billions of patients worldwide continue to benefit from scientists, discovering and developing medicines to treat severe pathogens and unknown causes.

As scientist continue to develop medicines that address significant unmet needs, future innovations will bring exciting new advances to help many more people worldwide.

Biotechnology and molecular science provide building blocks for a sustainable future. We envision a day when breakthrough drugs lead to a world without cancer, AIDS and many more incurable diseases, a world where there is sustainable development that will tackle energy, food and environmental needs without compromising the Earth's resources or its future.

Relationship between a DNA molecule, a functioning cell, and the human body

DNA

Deoxyribonucleic acid [DNA] is a molecule that transport the genetic instructions and carry out development, functioning and reproduction of all living organisms in our planet.

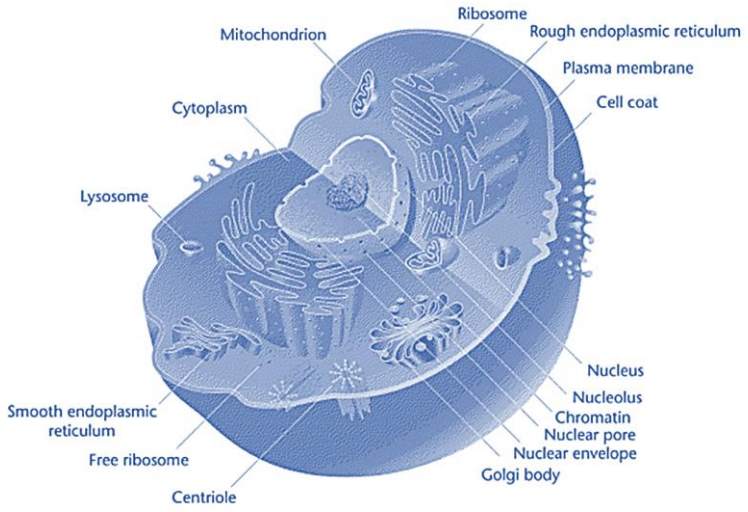
DNA are complex carbohydrates made from repeating units called nucleotides there are one of the main types of macromolecules essential for all known forms of life.

DNA usually occurs as linear chromosomes in eukaryotes and prokaryotes. The set of chromosomes in a cell makes up its genome. Human genome has approximately 3 billion base pairs of DNA arranged in to 46 chromosomes.

The information carried by DNA is held in the sequences of pieces of DNA called Genes. Transmission of genetic information is called base pairing.

Functioning cell

Functioning cell is the fundamental structural, and biological unit of all known organisms. A cell is the smallest component of life that can replicate independently. A functioning cells consist of cytoplasm enclosed within a membrane, which contains many biomolecules such as proteins and nucleic acids.



Organisms can be categorize as multicellular or unicellular. Most animal and plant cells are visible only under a microscope.

Number of cells in plants and animals varies from species to species, humans contain more than 10 trillion cells.

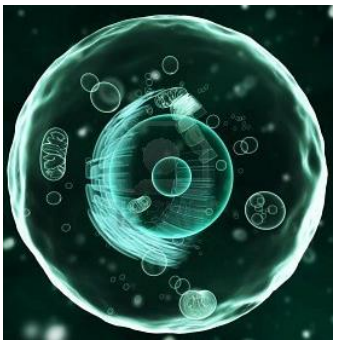
Human Body

The study of the human body involves physiology and anatomy. The human body can show anatomical non-pathological anomalies known as variations which need to be able to be recognised. At maturity, the estimated average number of cells in the body is given as 37.2 trillion. The composition of the human body can be referred to in terms of its water content, elements content, tissue types or material types.

The relationship between DNA and cells is one that is vital to sustaining life. DNA is made up of molecules called nucleotides. Each nucleotide contains a phosphate group, a sugar group and a nitrogen base. The four types of nitrogen bases are adenine (A), thymine (T), guanine (G) and cytosine (C). The order of these bases is what determines DNA's instructions, or genetic code. The order of nitrogen bases in a DNA sequence give instruction to cells.

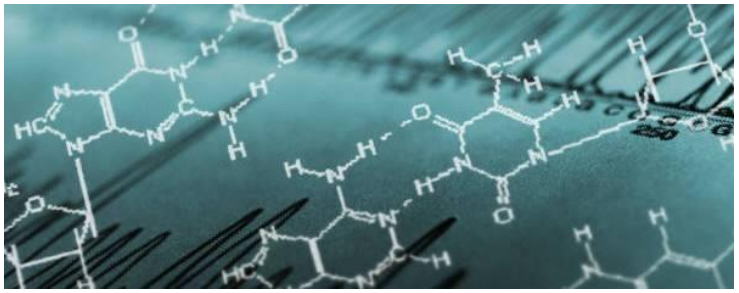
Cells are the building blocks of all living organisms. The human body is composed of trillions of cells. They provide structure for the body, take in nutrients from food, convert those nutrients into energy, and carry out specialized functions. Cells also contain the body's hereditary material and can make copies of themselves.

Cells have many parts, each with a different function. Some of these parts, called organelles, are specialized structures that perform certain tasks within the cell. DNA is made up of molecules called nucleotides and DNA sequence give instruction to cells.



The cell is the simplest and smallest unit, capable of carrying all the genetic instructions. Each cell is capable of performing the basic functions of life.

The tissue is categorized as a group of specialized cells that cap preform particular functions. Cells integrate together inside the body to form a tissue, each of which has a specialized function.



Organs are made up of group or layer of tissues. Organs have various functions according of its structure. Some of the organs have multiple functions diverse organs forms system. There are nine organ systems in the human body.
Every system has their unique functions. Organ system create a complete working organism.

Evaluation

Overall I like the layout and the details in my project. This project focus on the study of cell structure and functions, concentrating on the detailed understanding of the tissues and organisms. In essence, cell biology focuses on the structure and function and replication of the cell, from the most general properties to the unique particular to specialized cells.

This research represents a fully detailed report. To improve my research some areas may require more information and details furthermore my project could have use more imagers and examples. To increase the validity of results and to resolve any errors my project could have been examine by someone that specialise in cell biology and biochemistry.

In the future my report can be modified and improved using more evidence and results that can support conclusions above.