HUMAN CLONING

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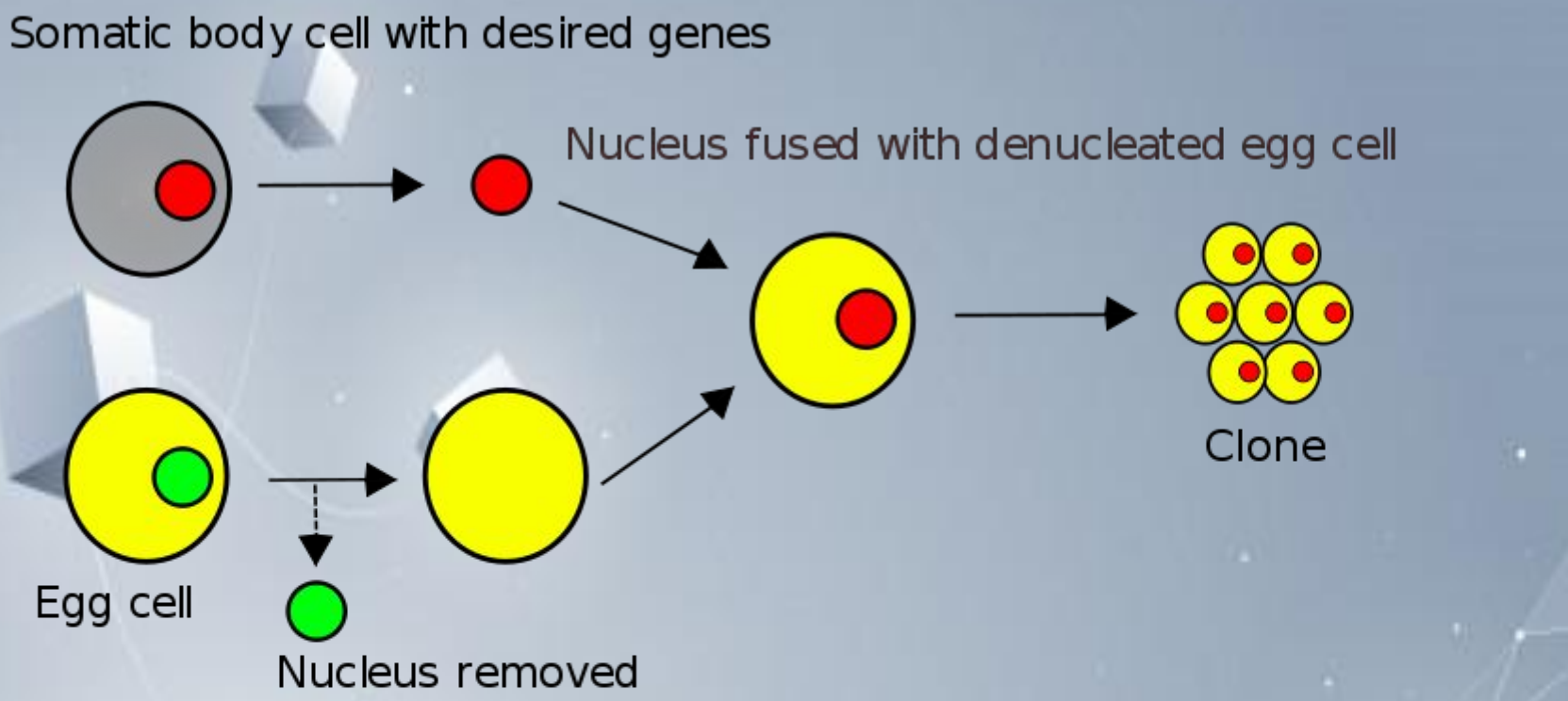
Human cloning is the creation of a genetically identical copy (or clone) of a human. The term is generally used to refer to artificial human cloning, which is the reproduction of human cells and tissue. It does not refer to the natural conception and delivery of identical twins. The possibility of person cloning has raised controversies. These ethical concerns have prompted several nations to pass laws regarding human cloning and its legality.

There are two types of cloning:

- Therapeutic Cloning
- Reproductive Cloning



REPRODUCTIVE CLONING

Surrogate Mother

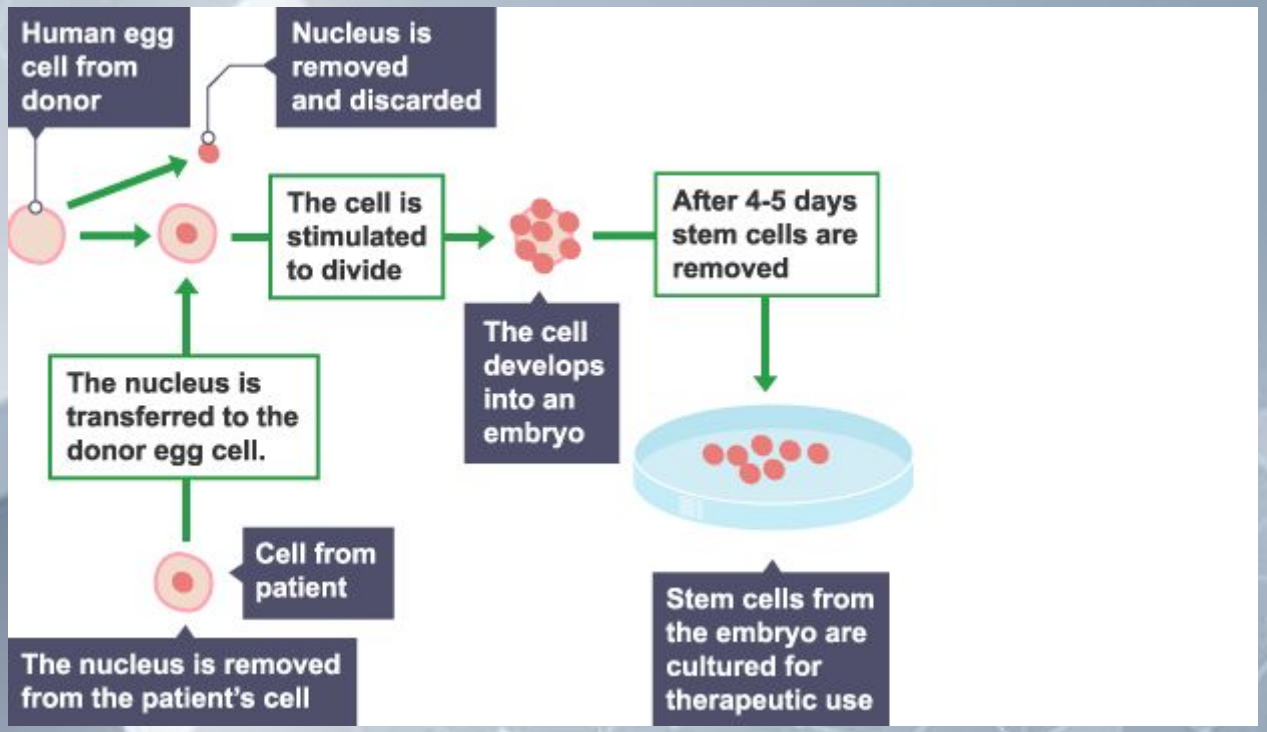
THERAPEUTIC CLONING

Tissue Culture

Therapeutic Cloning

Cloning designed as therapy for a disease. In therapeutic cloning, the nucleus of a cell, typically a skin cell, is inserted into a fertilized egg whose nucleus has been removed. The nucleated egg begins to divide repeatedly to form a blastocyst. Scientists then extract stem cells from the blastocyst and use them to grow cells that are a perfect genetic match for the patient. The cells created via therapeutic cloning can then be transplanted into the patient to treat a disease from which the patient suffers. In contrast to the goal of therapeutic cloning, the goal of reproductive cloning is to create a new individual, an idea that has stirred great controversy and met with almost uniform disapproval.

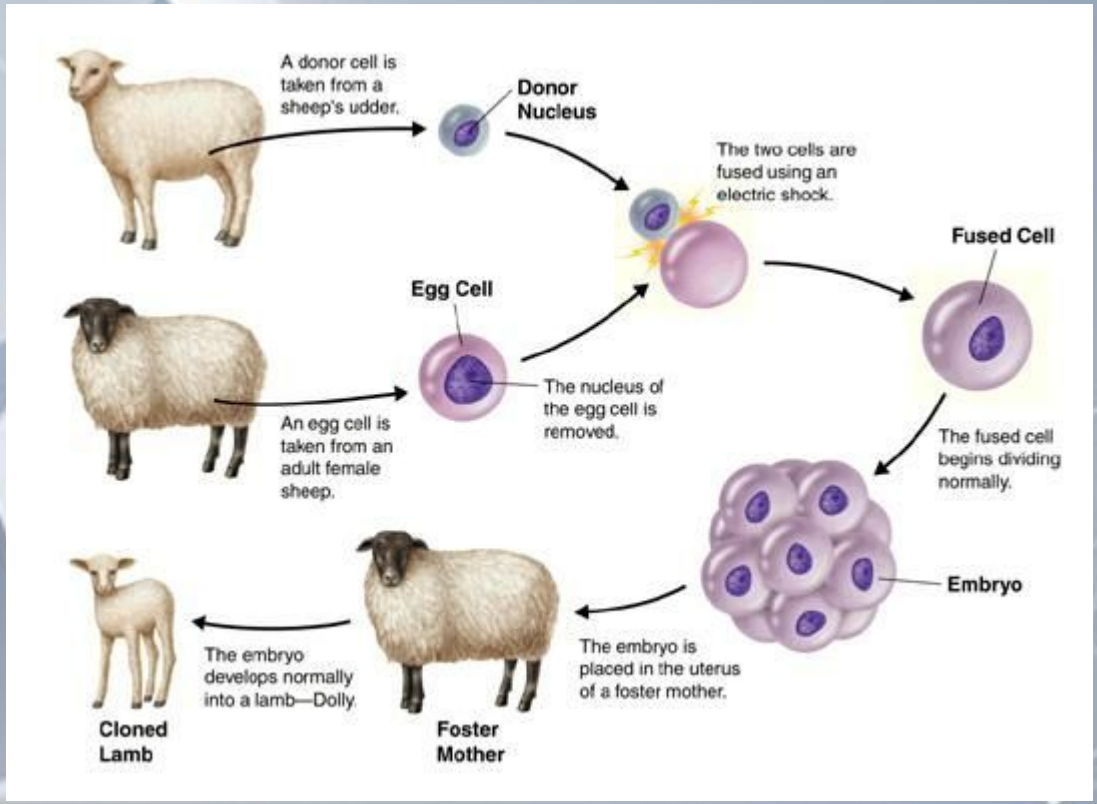
The production of embryonic stem cells for use in replacing or repairing damaged tissues or organs, achieved by transferring a diploid nucleus from a body cell into an egg whose nucleus has been removed. The stem cells are harvested from the blastocyst that develops from the egg, which, if implanted into a uterus, could produce a clone of the nucleus donor.



Reproductive Cloning

Reproductive cloning is defined as the deliberate production of genetically identical individuals. Each newly produced individual is a clone of the original. Monozygotic (identical) twins are natural clones. Clones contain identical sets of genetic material in the nucleus—the compartment that contains the chromosomes—of every cell in their bodies. Thus, cells from two clones have the same DNA and the same genes in their nuclei.

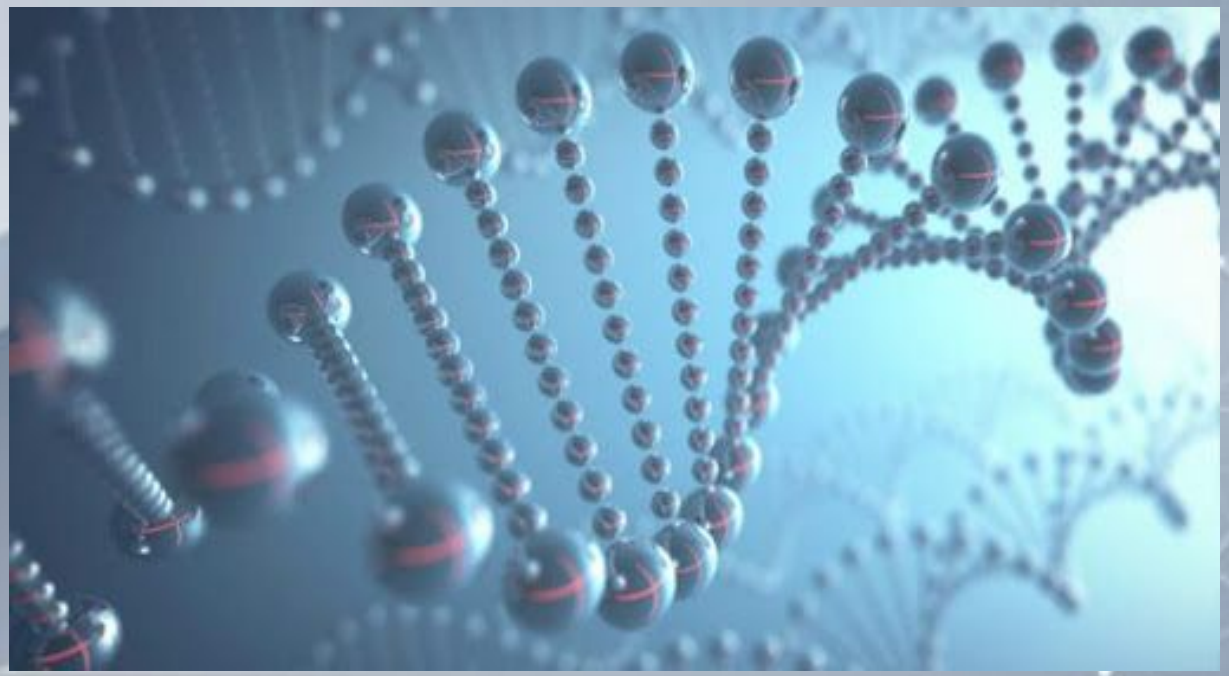
All cells, including eggs, also contain some DNA in the energy-generating "factories" called mitochondria. These structures are in the cytoplasm, the region of a cell outside the nucleus. Mitochondria contain their own DNA and reproduce independently. True clones have identical DNA in both the nuclei and mitochondria, although the term clones is also used to refer to individuals that have identical nuclear DNA but different mitochondrial DNA.



What is the difference between reproductive and therapeutic cloning?

Reproductive cloning involves creating an animal that is genetically identical to a donor animal through somatic cell nuclear transfer. In reproductive cloning, the newly created embryo is placed back into the uterine environment where it can implant and develop. Dolly the sheep is perhaps the most well known example. In therapeutic cloning, an embryo is created in a similar way, but the resulting "cloned" cells remain in a dish in the lab; they are not implanted into a female's uterus.

Human cloning often refers to human reproductive cloning to produce a genetic copy of an existing person. Despite decades of speculation, there has been no human reproductive cloning. Research cloning, also known as embryo cloning or therapeutic cloning, is another form of human cloning that produces genetically specific embryonic stem cells. After a series of failures and high-profile false claims of success, the first report of stem cells created from cloned human embryos was published in 2013.



Some of the major concerns surrounding raised by research cloning are the risks it poses to the women who would be needed to provide the large numbers of eggs required; exaggerated and probably unrealistic claims of "personalized" therapies; and the need for effective oversight to prevent rogue efforts to use cloned embryos for reproductive human cloning.

Human reproductive cloning is widely opposed. Overwhelming majorities, typically of 80% to 90%,have consistently rejected it in opinion surveys for over 20 years. While the U.S. has no federal law on human reproductive cloning, a number of states, dozens of other countries, and several international agreements formally prohibit it. Many scientists believe that human reproductive cloning can never be made safe. It would also threaten the psychological well-being of cloned children, and could open the door to more powerful inheritable genetic manipulation technologies.


Thank you for
attention