Global Journal of Life Sciences and Biological Research
ISSN: 2456-3102
OPEN ACCESS Freely available online
Perspective

Cloning Techniques: Advances in Somatic Cell Nuclear Transfer

Desta Noi*

Department of Geneticists, Hawassa University, Hawassa, Ethiopia

DESCRIPTION

Cloning is a subject of curiosity, and controversy for decades in the field of biological research. From the iconic creation of Dolly the sheep in 1996 to the potential implications for human cloning, the concept of cloning has stirred both excitement and ethical concerns. This article, discusses about the world of cloning in biological research, its history, various techniques, applications, and the ethical dilemmas it raises.

The term "cloning" originates from the Greek word "kloon," meaning "twig" or "branch," and was first used in the early 20th century to describe the process of creating genetically identical plants through asexual reproduction. However, it wasn't until the latter part of the 20th century that cloning entered the realm of animal and human research. The most iconic breakthrough in cloning came in 1996 when Scottish scientists successfully cloned Dolly the sheep using a technique known as Somatic Cell Nuclear Transfer (SCNT). Dolly was the first mammal cloned from an adult somatic cell, marking a significant milestone in cloning research. Since then, scientists have continued to advance the field, exploring various cloning techniques and their applications.

Cloning techniques

Somatic Cell Nuclear Transfer (SCNT): SCNT involves the transfer of the nucleus from a somatic (body) cell of an organism into an egg cell that has had its nucleus removed. This technique was used to create Dolly the sheep and has since been applied to clone other animals, including cattle and cats. SCNT holds promise for preserving endangered species and generating genetically modified animals for scientific research.

Reproductive cloning: Reproductive cloning aims to create a genetically identical copy of an existing organism. This technique has been used in the animal industry to replicate superior livestock for breeding purposes. It has also raised ethical concerns, particularly in the context of human cloning.

Therapeutic cloning: Also known as Somatic Cell Nuclear Transfer (SCNT) for therapeutic purposes, this technique is used to create embryonic stem cells for medical research. These cells can potentially be used to develop treatments for various diseases, as they can differentiate into different cell types. Therapeutic cloning offers great promise for regenerative medicine but is not without controversy.

Applications of cloning in biological research

Biomedical research: Cloning techniques, particularly therapeutic cloning, have opened doors to studying diseases and developing potential treatments. By creating patient-specific stem cells, scientists can better understand diseases and test the efficacy of drugs in a more personalized manner.

Agricultural advancements: Cloning has been applied to enhance agricultural practices by replicating superior livestock and crops. This has the potential to improve food production and quality while reducing the need for genetic modification.

Conservation efforts: Cloning can play a role in preserving endangered species by creating genetically identical individuals. The "frozen zoo" concept involves banking the genetic material of endangered species for potential future cloning efforts.

Organ transplants: Research into cloning and tissue engineering holds promise for growing organs and tissues for transplantation, reducing the demand for donor organs.

Ethical dilemmas: The advancement of cloning techniques has also sparked intense ethical debates. Here are some of the key ethical concerns associated with cloning in biological research.

Human cloning: The prospect of cloning humans raises profound ethical questions about individuality, identity, and the potential for misuse. Many countries have banned or imposed strict regulations on human cloning to prevent unethical practices.

Reproductive cloning: Reproductive cloning of animals for commercial purposes raises concerns about animal welfare, cloning failures, and the potential for genetic homogeneity.

Cloning for organ harvesting: The idea of creating human clones for the sole purpose of harvesting organs has been a subject of intense ethical debate. It raises questions about the autonomy and rights of cloned individuals.

Correspondence to: Desta Noi, Department of Geneticists, Hawassa University, Hawassa, Ethiopia, E-mail: desta05@gmail.com

Received: 28-Aug-2023, Manuscript No. GJLSBR-23-27098; **Editor assigned:** 31-Aug-2023, PreQC No. GJLSBR-23-27098 (PQ); **Reviewed:** 15-Sep-2023, QC No. GJLSBR-23-27098; **Revised:** 22-Sep-2023, Manuscript No. GJLSBR-23-27098 (R); **Published:** 29-Sep-2023, DOI: 10.35248/2456-3102.23.9.041

Citation: Noi D (2023) Cloning Techniques: Advances in Somatic Cell Nuclear Transfer. Glob J Lif Sci Biol Res. 9:041.

Safety and long-term consequences: The long-term health and well-being of cloned animals and potential consequences for genetic diversity are ongoing concerns. Cloning in biological research represents a fascinating area of scientific exploration with the potential for significant benefits in medicine, agriculture, and conservation. However, the ethical dilemmas it presents cannot be ignored. As science continues to progress, it is crucial for society to engage in thoughtful discussions and establish regulations that balance the potential benefits of cloning with ethical considerations. Cloning is a powerful tool, but its responsible use is essential to navigate the complex terrain of biology, ethics, and human values.