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Editorial on Therapeutic cloning

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EDITORIAL

The fields of regenerative medicine and tissue engineering are aimed at restoring the form and function of diseased or injured tissue and organs. Many illnesses, including congenital defects, cancer, trauma, infection, inflammation, iatrogenic injuries, and others, can result in organ damage or loss, necessitating restoration. Furthermore, taking the kidney as an example, end-stage renal illness is expected to affect over two million people by 2010. The bulk of modern reconstructive procedures rely on donor tissue for replacement; nevertheless, donor tissue scarcity may limit these types of reconstruction, and the harvest procedure is usually associated with severe morbidity. Furthermore, these reconstructive operations seldom replace the functional features of the injured organ, and they may even induce difficulties due to the intrinsically differing functional properties of regenerated tissue. Homologous tissues from cadavers, heterologous tissues from animal sources (bovine), and artificial materials (silicone, polyurethane, Teflon) are all possible sources of tissue. Artificial devices produced from these alternative sources have been found to be biocompatible and capable of structural replacement; however, the functional component of the original tissue is rarely regained. While disease prevention and caution will never totally eliminate the occurrence of disease and injury, regenerative medicine clinicians and researchers aspire to alleviate their patients' suffering by repairing or restoring damaged tissue in the hopes of rebuilding essentially normal body components. Organ transplantation was one of the first procedures in modern medicine to restore form and function. This ground breaking surgery, which was one of the first to break through the immunologic barrier, ushered in a new era in which transplantation could be utilised to treat diseased and injured organs. Since then, breakthroughs in immunosuppressive drugs, matching similar donors to recipients, and treating rejections have resulted in the successful transplantation of donor organs in thousands of patients each year.

Nuclear cloning, which has also been called nuclear transplantation and nuclear transfer, involves the introduction of a nucleus from a donor cell into an enucleated oocyte to generate an embryo with a genetic makeup identical to that of the donor. There are two types of nuclear cloning: reproductive cloning and therapeutic cloning. Reproductive cloning is a technique for creating an embryo with the same genetic material as the cell source. This embryo can then be put into a female's uterus, resulting in a child that is a clone of the donor. Therapeutic cloning, on the other hand, is utilised to create early stage embryos that are explanted in culture to produce embryonic stem cell lines with genetic material that is identical to the source. These autologous stem cells have the ability to transform into practically any type of cell in the adult body, making them valuable for tissue and organ replacement. Some potential applications include the therapy of disorders including end-stage kidney disease, neurological diseases, and diabetes, for which immuno-compatible tissue transplants are scarce. As a result, therapeutic cloning, also known as somatic cell nuclear transfer, offers a different supply of transplantable cells.