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Current status and perspectives of stem cell and cloning technologies in regenerative medicine and disease therapeutics

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Without any doubt, regenerative medicine is the major innovation in health care because of its great capacity to repair or replacement of damaged/diseased human cells, tissues or organs to restore normal function. Despite past limited success in the clinical translation of several promising preclinical results, the spectacular recent progress in the field of stem cells and somatic cell nuclear transfer (SCNT) technologies has laid the promising foundation for cell based therapies of disease which cannot be cured by conventional medicines. The rapid advancement of stem cells technology can be illustrated by the progression of human embryonic stem cells (hESCs), induced pluripotent stem cells (iPS) and the use of pluripotent vs. somatic and of allogenic vs. autologous stem cells for a series of cell based therapies which have received Food and Drug Administration (FDA) approval and are now commercially available. On the other hand, the rapid advancement of SCNT technology can be illustrated by technical improvements, development of human and monkey cloned embryos and ESCs thereof as well as disease modeling and production of new lines of genetically modified cloned animals for xenotransplantation. Here, these advances and other regenerative medicine approaches currently being studied in preclinical and clinical settings will be reviewed. The popular view and the ethical issues will be addressed and finally, the perspectives, challenges and directions for the future of regenerative will be discussed.

Biography

Sayyed Morteza Hosseini is an Associate Professor and Senior Researcher at Department of Embryology, Advanced Center for Biotechnology, Dubai, UAE. His studies have focused on the molecular and cellular aspects of reproductive biotechnology, epigenetic reprogramming and developmental reprogramming. He has authored more than 70 publications and has been involved in different projects on animal cloning and transgenesis for production of pharmaceutical drugs and also transplantable organs.

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