

Every Stem Cell has Two Sides

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Editorial

It is my honor and privilege to be an editor of the Journal of International Stem Cell Research & Therapeutics (IJSRTC). In 1998, Dr. James A. Thomson first described the human embryonic stem cell line derived from human blastocyst, which disclosed a new era of stem cell research [1]. In following two decades, more different types of stem cells have been identified and investigated. For example, hematopoietic stem cells and mesenchymal stem cells belong to adult stem cell population (also known as postnatal stem cell population), which plays a vital role for tissue regeneration. Additionally, the stem cell model is also applied into tumorigenicity in recent years [2]. Cancer stem cell population or tumor initiating stem cell population, which describes a special population in a bulk tumor, plays a critical role for tumor recurrence, metastasis and drug resistance. Another milestone of stem cell research is Dr. Shinya Yamanaka successfully transformed the fibroblast cells into induced pluripotent stem cells (iPSCs) *via* transfecting four transfection factors in 2006 [3]. Soon afterwards, other scientists also successfully generated iPSC cell lines *via* transfection of three or four stem cell factors from additional adult cells, such as human keratinocytes [4] or peripheral blood cells [5]. Dr. Yamanaka's finding leads a brand-new avenue for stem cell therapy and won a share of Nobel Prize in Physiology or Medicine in 2012. However, there are still some challenges and obstacles for stem cell research and therapy, except ethical issues. For instance, during the induction of stem cells into a certain lineage or type of progenitor or mature cells, most of scientists utilize sequential growth factors stimulation to mimic the condition of embryonic development. However, the functions of stem cell-derived cells are usually not as good as somatic tissues, suggesting other factors are required to take into account [6]. For stem cell therapy, the advantage of stem cells is pluripotency, which indicates they have potential to give rise to various types of progenitors or somatic cells under certain circumstances. Yet, for therapeutic aspect, the disadvantage of stem cell therapy still is pluripotency because it means the risk of teratoma formation after transplantation. Hence, before the transplantation, the level of purity of stem cell-derived mature cells becomes a critical issue for the safety of stem cell therapy [7]. To shed light on the stem cell research and therapy, IJSRTC would like to unravel the stem cell from different aspects, such as procedures that can improve of stem cell induction or purification,

the underlying machinery of genetic, epigenetic or metabolic regulations on stem cells, or micro-environmental effects on stem cell-derived mature cells after transplantation, etc. We welcome and invite you to share and submit your contribution of biomedical research, clinical medicine or the allied stem cell professions for consideration. We believe IJSRTC will culminate one of the world's leading academic medical journals with the international medical research community through sharing your valued contribution.

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