Stem Cells International

Special Issue on
Genome Editing in Stem Cells

Hindawi

CALL FOR PAPERS

Genome editing and stem cells have become the two most promising and powerful technologies in understanding the genetic or cellular mechanisms of human degenerative diseases. They also provide new hopes for developing personalized regenerative medicine.

Stem cells, with their unique characteristics of self-renewal and their potential of giving rise to any kind of cells in the body, are attractive cell source for in vitro modelling of human diseases. Currently, the most broadly used stem cells in biomedical research are embryonic stem cells, somatic stem cells, and particularly induced pluripotent stem cells (iPSCs). Patient-specific iPSCs are an import platform for studying disease mechanisms and drug screening and have the potential of personalized cell therapy.

During the last four years, biomedical research has been revolutionized by the discovery of programmable DNA nucleases. This technology, more frequently known as the Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and CRISPR-associated protein 9 (Cas9), has been rapidly and broadly adapted for precision genome editing and gene regulation across almost all species and cell types, including stem cells. Genome editing using CRISPR-Cas9 or other programmable DNA nucleases in stem cells is a powerful approach for studying the pathogenesis of inherited human diseases and for understanding the biological mechanisms behind these. Moreover, these techniques can potentially create better ways of developing feasible approaches for regenerative medicine.

In this special issue, we invite authors to contribute original research articles, methods, protocols, resources, and review papers that have been demonstrated to improve the applications of genome editing in stem cells. The origin of stem cells is not limited to human stem cells.

Potential topics include but are not limited to the following:

- Improved delivery of genome editing vectors into stem cells
- Novel or improved methods in gene knockout, knock-in, or gene tagging in stem cells
- Generation of isogenic stem cells through gene editing
- Application of gene editing to decipher gene functions in stem cell biology
- Gene editing in somatic stem cells, for example, mesenchymal stem cells, hematopoietic stem cells, and neural stem cells
- Gene editing in stem cells used for tissue engineering
- Gene editing for enhancement of stem cells in differentiation
- Targeted gene activation or inhibition in stem cells
- LncRNA or miRNA editing in stem cells
- Gene and cell therapy using genetically edited stem cells
- Effect of genome editing on stem cells pluripotency
- Genome-wide gene editing and high-throughput screening in stem cells
- Engineered stem cells for drug screening
- Inducible gene editing in stem cells
- Regulation or tracing of lineage differentiation through genome editing
- Ethical comments on genome editing in stem cells
- Guidelines for safety and efficacy evaluation for genome editing in stem cells

Authors can submit their manuscripts through the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/sci/gesc/.

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