Pluripotent stem cells and their use in hearing loss

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Abstract: Throughout its half a century of development, stem cell research has included two main fields: embryonic stem (ES) cell research and the reprogramming of body somatic cells. In the present review we focused on stem cell reprogramming and its relation with otolaryngology. The human body somatic cells are transformed into pluripotent cells by three basic methods: the somatic nuclear transfer method, the somatic cell fusion method (getting cellular pluripotent capacity in cellular reprogramming), and by transcription factors influencing the body somatic cells to generate reprogrammed induced pluripotent stem (iPS) cells. ES cells and iPS cells have pluripotency and differentiate into cells originating from the three germ layers; they are preferred for cellular treatment, drug development, and disease modeling research. Because of ethical restrictions in obtaining ES cells, iPS cells are an alternative pluripotent cell source and patient-specific autologous pluripotent cells are obtained by this method. Cellular treatment and regenerative medicine with pluripotent cells are currently developing and we aimed to raise awareness about this topic in our paper on using iPS cell technology in the biological treatment of hearing loss, which is an important area of research in otolaryngology.

Key words: Stem cell, sensory hair cell, iPS cell