

Comparative Characteristics of Mesenchymal Stem Cells from Clonal Populations at Different Sites of Rat Larynx

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Background and Purpose

Various cell types of laryngeal subsites have been isolated and suggested for the candidate of laryngeal tissue-resident stem/progenitor cells, but it still remains to elucidate the stem cell characteristics and their biological roles in laryngeal tissue regeneration. This study was conducted to investigate the comparative mesenchymal stem cells (MSC) characteristics of clonal populations from rat laryngeal mucosa (LM), vocal fold lamina propria (LP), and macula flava (MF) comparing with bone-marrow (BM)-MSCs.

Materials and Methods

Single cell-derived laryngeal clonal cells were isolated by the subfractionation culturing method following microdissection of epiglottic LM, vocal fold LP, and MF of rat larynx. Several clonal populations from three laryngeal subsites were chosen and expanded *in vitro*. MSC characteristics of self-renewal, marker expression, differentiation potential, and immunosuppressive activity were investigated.

Results

LM- and LP-resident clonal cells showed fibroblast-like features but MF-resident clonal cells showed stellate cell morphology with different level of lipid droplet, and GFAP and desmin expression. All laryngeal clonal cell populations showed MSC-like characteristics in terms of their proliferative activities, marker expression and differentiation potential into fat, bone, and cartilage cell lineages with some different potential in each clones. They also possessed immunomodulatory properties as comparable with BM-MSCs.

Conclusion

These results suggest that there are laryngeal tissue-specific stem cells in different subsites of larynx with some different MSC characteristics and tissue-proper properties. Further investigation needs to be performed to investigate their biological roles in laryngeal tissue regeneration and clinical implications.

Key Word: Larynx, Vocal folds, Macula flava, Mesenchymal stem cells, Multipotent stem cells