

Development of safety evaluation tools for oral care reagents using gingiva-derived iPS cells

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The aim of this project is to develop bioengineered safety evaluation tools for oral care reagents using patient-derived stem cells, which mimics structure and function of oral mucosa and tongue in vitro. We first generated iPS cells from human gingival fibroblasts via transduction of Oct3/4, Sox2, Klf4 without using c-Myc oncogene. By this method, gingival fibroblasts demonstrated a higher reprogramming efficiency than the skin fibroblasts, which have been conventionally used for the generation of iPS cells. We also generated dendritic cells from mouse iPS cells which showed antigen-presenting cell function. To fabricate tongue structure in vitro, we applied cyclic strain to mouse bone marrow-derived mesenchymal stem cells. We found that application of cyclic strain greatly enhances the skeletal myogenesis of these stem cells with an aligned structure. These findings would be important step toward the further application of these methods to apply development of safety evaluation tools for oral care reagents.