

Analysis and regulation of tooth morphogenesis

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【Outline of survey】

In tooth morphogenesis, the dental epithelium and mesenchyme interact reciprocally for growth and differentiation to form the proper number and shapes of teeth. Previously, about twenty genes expressed in tooth specifically were identified by microarray and computer based differential display methods. Among of these genes, gap junctional molecule Gja1 is expressed in tooth germ. Gja1 null-mouse showed disorganization of ameloblasts. Epiprofin (Epfn) is tooth specific transcription factor. Epfn mutant showed increase number of tooth. Mutant mouse of down-stream signal molecules for ectodysplatin A showed decrease tooth width. These results indicated that these tooth specific molecules regulate tooth number and shape. We will analyze their gene function and molecular mechanism of abnormal tooth formation in their mutant mice.

【Expected results】

By this project, we will gain several novel molecular mechanisms for the determination of tooth size and shape. These discovered mechanisms will help to understand the morphogenesis of not only tooth, but also the organs formed by epithelial-mesenchymal interaction. It is possible to organize the artificial tooth, which has proper size and shape, using their information about tooth morphogenesis.

【References by the principal investigator】

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【Term of project】 FY2008—2012

【Budget allocation】

78,100,000 yen (direct cost)

【Homepage address】

None