

Abstract

The development of the mouse tooth primordium is an important model for studying odontogenesis, as well as general organogenesis. The development of the mouse lower incisor is of remarkable interest. The epithelial anlage of the mouse lower incisor is interconnected with the vestibular anlage via the epithelial bridges. According to some authors, the epithelial bridges represent an area, where the transient rudimentary incisor germ appears. From a morphological point of view, the first sign of ongoing epithelial-mesenchymal interactions during early odontogenesis is the thickening of oral epithelium. From a molecular point of view, it is the expression of the *Shh*, *Eda*, *Edar*, *Pitx2*, *Bmp2*, *Bmp4* and *Dlx2* genes.

Except for the transcription domain, representing the proper signalling centre of a developing prospective incisor, a transient transcription domain, localized anteriorly and superficially, appears in the odontogenic zone of the epithelium during early development. The anterior transcription domain originates in the area of epithelial bridges, and according to some authors, from an evolutionary point of view, it corresponds with the signalling centre of the rudimentary incisor germ.

The aim of this diploma thesis was to compare the temporospatial dynamics of SHH and EDA protein expression in the anterior part of the mouse mandible during embryonic development in the context of the development of prospective incisors and externally located epithelial structures. By utilizing immunohistochemical staining, it was confirmed that SHH protein is expressed in the same pattern as *Shh* gene. The EDA protein is expressed in the area of epithelial bridges, similarly to SHH. In the area of a prospective functional incisor, the EDA protein is not expressed. However, EDA expression was detected in the anlage of the oral vestibule. The presence of odontogenic markers, like SHH and EDA, in the area of epithelial structures externally to developing incisors could explain the potential of these non-dental epithelial structures to give rise to dental tissues and elucidate the etiology of developmental dental pathologies, such as peripheral odontomas, which appear labially and buccally to the dental arch in humans

Keywords: tooth, mouse , SHH, EDA, rudimentary tooth, tooth development