

## Abstract

Dentition is a key vertebrate innovation showing not only great morphological diversity, but also different maintenance or replacement of functional teeth. Most extant vertebrates replace their dentition through addition of new teeth from deeply invaginated epithelium, i.e. the successional dental lamina, due to presence of dental stem cells. However, in some early branching lineages of ray-finned fishes (Actinopterygii), new tooth germs arise from the adjacent superficial epithelium without the presence of the successional dental lamina. Whether the two types of dental development in vertebrates are equivalent and whether comparable dental stem cells play role in tooth replacement is currently not satisfactorily evaluated.

This Master thesis aims at describing the development of palatal and pharyngeal dentition of a member of an early branching lineage of ray-finned fishes, the sterlet sturgeon (*Acipenser ruthenus*). The sterlet dentition is fairly dynamic. The teeth are replaced without the successional dental lamina, however, this replacement shows characteristics similar to those described in vertebrates with the successional dental lamina. A marker of dental stem/progenitor cells, Sox2, is localized in the outer dental epithelium of the predecessor tooth in the vicinity of the adjacent taste buds in correlation with the presence of the so-called „label-retainig cells“. On the other hand, cells distant from this place exhibit proliferative characteristics and presence of factors responsible for odontogenesis.

Based on my work, I propose a hypothesis that new teeth of the sterlet develop from dental stem cells localized in immediate proximity to taste buds, i.e. a comparable situation to teeth developing from the successional dental lamina. The localization of stem cells niche implies that dentitions with or without the successional dental lamina represent similar developmental systems diverging only in their phenotypic expressions.