

## WNT SIGNALING IN TOOTH REPLACEMENT

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Mammals normally develop only two dentitions. After the development of the permanent dentition, there is no additional tooth replacement. However, if the runt-domain transcription factor Runx2 is mutated in humans, the patients develop supernumerary teeth which represent the third dentition (1, 2). Also Wnt signalling has been associated with tooth renewal. In humans when the Wnt inhibitor Axin2 is mutated, the patients show tooth agenesis specifically in the permanent dentition (3). Moreover, we have shown that activated Wnt signalling in dental epithelium leads to continuous tooth generation in mice (4). These and other results suggest that both Runx2 and Wnt signalling regulate mammalian tooth replacement. We are using transgenic mouse models and in vitro studies in order to further examine the roles of Wnt signalling and Runx2. We have studied the regulation of Runx2 in dental mesenchyme in vitro and shown that Wnt induces Runx2. This indicates that Wnt and Runx2 signalling pathways may interact and supports the idea that Wnt signalling plays a central role in tooth renewal in mammals. Furthermore, as mice develop only one dentition, we started to investigate the mechanism of tooth replacement in other animals to gain new insight into the precise morphological and molecular changes that take place during the events of tooth replacement. Observations on tooth replacement in the common shrew, *Sorex araneus*, and the ferret, *Mustela putorius* will be reported.