

## **Decoding, Induction, and Maintenance of “Seed Cells” for Whole Tooth Regenerations**

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Our ground-breaking research in regenerative dentistry has significantly advanced our understanding of whole tooth regeneration. Through the mapping of cell lineage in developing mouse dental germs, the differentiation of human induced pluripotent stem cells (iPS) into functional neural progenitor cells, and the identification of a rare subpopulation of cranial neural crest cells with the potential for tooth formation, we have made remarkable progress in the field. Particularly noteworthy is our successful induction of whole teeth formation in vitro using beagle dogs as a large animal model, which expands the possibilities of using mesenchymal cells for tooth regeneration. These achievements not only provide valuable insights into tooth development but also offer promising therapeutic avenues for treating periodontal disease and revolutionizing tooth regeneration using cranial neural crest cells. Our research marks a significant milestone in pre-clinical dentistry and holds immense potential for practical applications in the field of tooth regeneration.