

## Regenerative dentistry could restore damaged teeth

Teeth develop through a complex process in which soft tissue, with connective tissue, nerves and blood vessels, are bonded with three different types of hard tissue into a functional body part. As an explanatory model for this process, scientists often use the mouse incisor, which grows continuously and is renewed throughout the animal's life.

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Using a single-cell RNA sequencing method and genetic tracing, researchers at Karolinska Institutet, the Medical University of Vienna in Austria and Harvard University in the USA have now identified and characterized all cell populations in mouse teeth and in the young growing and adult human teeth.

“From stem cells to the completely differentiated adult cells we were able to decipher the differentiation pathways of odontoblasts, which give rise to dentine — the hard tissue closest to the pulp — and ameloblasts, which give rise to the enamel,” say the study's last author Igor Adameyko.

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Some of the finds can also explain certain complicated aspects of the immune system in teeth, and others shed new light on the formation of tooth enamel, the hardest tissue in our bodies.

“We hope and believe that our work can form the basis of new approaches to tomorrow's dentistry. Specifically, it can expedite the fast expanding field of regenerative dentistry, a biological therapy for replacing damaged or lost tissue.”

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