

Common origin identified could bring tooth regeneration potential closer

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A common origin shared by teeth and taste buds in a fish that has regenerative abilities has been identified by a team of researchers from the UK and the States. Regulated by the BMP signalling pathway, the results suggest that the oral organs have surprising regenerative capabilities and can be manipulated to express characteristics of

different tissue types.

The collaborative study between King's College London and Georgia Institute of Technology, Atlanta was recently published in the journal *PNAS* (*Proceedings of the National Academy of Sciences* of the United States of America). As nearly one-third of all adults over the age of 65 have lost all their teeth, the two teams set out to understand tooth renewal in animals that have replacement and regeneration capabilities.

Using cichlid fishes and mouse models and building on previous studies in regeneration, the researchers found that replacement teeth share a continuous epithelium with developing taste buds and that both organs share very similar stem cell populations. The BMP signalling pathway acts on this shared epithelium to distinguish teeth from taste buds.

At Professor Paul Sharpe's lab at King's College London, mouse genetic models where BMP signalling activity is modified showed that [teeth](#) gene expression is ectopically activated in [taste buds](#) when BMP signalling is elevated. These findings indicate underappreciated epithelial cell populations with promising potential in bioengineering and dental therapeutics.

Professor Sharpe, Head of the Centre for Craniofacial & Regenerative Biology at King's College London said: "This research is an excellent example of the power of studying multiple species in order gain novel insights that can impact upon human regenerative medicine."

More information: Ryan F. Bloomquist et al., "Developmental plasticity of epithelial stem cells in tooth and taste bud renewal," *PNAS* (2019). www.pnas.org/cgi/doi/10.1073/pnas.1821202116

Provided by King's College London

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