

# Reversing Tooth Decay with Biomimetic Peptide Gel

## CLINICAL NEED

Demineralization in tooth is often the cause of various dental concerns including dental cavities and hypersensitivity. The currently available commercial products with claims for remineralization properties aim to stabilize calcium and phosphate to deliver a high dosage of the ions to the oral cavity. Because this process is an indirect approach to mineralization, it cannot directly and catalyze mineral formation on the tooth surface, thereby limiting their clinical and long-term effectiveness.

## SOLUTION

To address this need, a team of researchers at the University of Washington, led by Prof. Mehmet Sarikaya and Dr. Hanson Fong, has developed a peptide-containing gel to direct primary biomineralization of the lost dental tissues to treat tooth decay and other dental ailments caused by demineralization. The peptides have been demonstrated to form calcium phosphate minerals of controlled structural characteristics, forming stable layers of deposited mineral on extracted human and rat teeth, both on dentin and on enamel.

## COMPETITIVE ADVANTAGE

This gel formulation is expected to be topically applied on the carious teeth with early stage tooth decay to restore mineral on the affected surface. As with the currently used fluoride varnish, this gel would also be applied in dentist's office. While the fluoride varnish does not actively add new mineral to the tooth surface, the active, mineralizing gel will serve as an effective procedure to reverse cavity progression.

## ITP SUPPORT

With the overall objective to develop a user-friendly prototype product for the permanent treatment of demineralization-driven conditions including dental caries and hypersensitivities, the ITP program will be supporting the continued validation of the peptide-containing gel formulation for guided remineralization and exploration of FDA regulatory and OTC and clinical marketing strategies.



HANSON FONG,  
PHD

University of Washington

MEHMET SARIKAYA,  
PHD

University of Washington

*“Novel remineralization therapies guided by naturally derived peptides will transform current dental health providing preventative and restorative oral care.”*

[www.uwgemsec.com/principal-investigator](http://www.uwgemsec.com/principal-investigator)

## CLINICAL TRANSLATION PATHWAY

### Publications:

Biomimetic Tooth Repair: Amelogenin-Derived Peptide Enables *in vitro* Remineralization of Human Enamel. ACS Biomater Sci Eng 2018.

Early caries in an *in vivo* Model: Structural and nanomechanical characterization. J Dent Res 2018.

### Intellectual Property:

US 9,809,633 Reagents and Methods for Treating Dental Disease

PCT/US2017/013492 Reagents and Methods for Mineralization of Tooth Enamel

### Regulatory Pathway:

In development with the MPWRM Regulatory Core

### Commercialization Strategy:

In development with the MPWRM Commercialization/Market Needs Core

### Product Launch Strategy:

In development with the MPWRM Commercialization/Market Needs Core

Michigan-Pittsburgh-Wyss Regenerative Medicine Resource Center is supported in part by the National Institute of Dental & Craniofacial Research of the National Institutes of Health under Award Number U24DE026915. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Contact Information:

Mutsumi Yoshida, PhD | Managing Director, U-M site | yoshidam@umich.edu | [www.doctr.com](http://www.doctr.com)



Michigan • Pittsburgh • Wyss  
Regenerative Medicine Resource Center