



# Reversing Tooth Decay with Biomimetic Peptide Gel

## Clinical Need

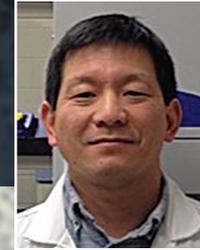
Demineralization in tooth is often the cause of various dental concerns including dental cavities and hypersensitivity. The currently available commercial products with claims for remineralization properties aim to stabilize calcium and phosphate to deliver a high dosage of the ions to the oral cavity. 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, generalizing gel will serve as an effective procedure to reverse cavity progression.



**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.”*

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## How the ITP Program Supports this Project

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.

## Clinical Translation Pathway

### Publication:

Biomimetic Tooth Repair: Amelogenin-Derived Peptide Enables in Vitro Remineralization of Human Enamel. Dogan S, Fong H, Yucosoy DT, Cousin T, Gresswell C, Dag S, Huang G, Sarikaya M. ACS Biomater. Sci. Eng., 2018, 4 (5), pp 1788–1796. (<https://pubs.acs.org/doi/10.1021/acsbomaterials.7b00959>)

Early caries in an in vivo Model: Structural and nanomechanical characterization, Yucosoy DT, Fong H, Gresswell C, Saadat S, Chung WO, Dogan S, Sarikaya M., J Dent Res, Aug 1, 2018. (<https://www.ncbi.nlm.nih.gov/pubmed/30067915>)

### Intellectual Property:

PCT/US2016/039650 Reagents and Methods for Treating Dental Disease (<https://patents.google.com/patent/WO2012166626A1/>)

PCT/US2016/013301 Reagents and methods for whitening teeth (<https://patents.google.com/patent/WO2016115283A2>)

PCT/US2017/013492 Reagents and methods for mineralization of tooth enamel (<https://patents.google.com/patent/WO2017123986A1>)

### Commercialization Strategy:

In development with the MPWRM Commercialization/ Market Needs Core

### Regulatory Pathway:

In development with the MPWRM Regulatory Core

### Product Launch Strategy:

In development with the MPWRM Commercialization/ Market Needs Core

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