

REGENDOGEL: A BIOINSPIRED HYDROGEL SYSTEM FOR ENDODONTIC THERAPY



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Clinical Need – Dental caries is a common health concern worldwide. When caries damage the enamel deeply enough to reach the dentin, a resulting inflammatory response can damage the adjoining dental pulp. While current clinical treatments may slow the progression of resultant tooth decay, no treatments exist to regrow dental pulp and dentin lost to infection, decay, or trauma. What is needed is a regenerative therapy that activates the tooth's inherent healing processes to regrow pulp and dentin.

Solution – RegendoGEL is a biodegradable, hydrogel-based product that contains natural tooth-derived bioactive molecules that stimulate "guided dental pulp and dentin regeneration". Unlike currently used calcium and silicate cements, RegendoGEL renews tooth vitality by regenerating natural dental tissues that extend the life of patients' teeth.

Competitive Advantage – As compared to conventional permanent, nondegradable cement-based products, RegendoGEL is biodegradable, and stimulates its replacement by regenerated natural dental pulp and dentin tissues. In vivo animal studies showed that RegendoGEL can regenerate dentin ~5x faster than existing products on the market. RegendoGEL's biocompatible, non-inflammatory and biodegradable properties reverse the degenerative spiral of tooth decay, which normally progresses from a small cavity and filling to larger fillings, eventually leading to endodontic treatment and tooth replacement therapies.

ITP Support – The ITP program has supported various aspects of this project, including: Regulatory; Pre-Clinical Animal studies; and Micro-CT, Histology and Statistical Cores. Ongoing guidance on how best to bring our product to the market has been provided by the Market Assessment and IP/ Commercialization Cores.

FOUNDATIONAL PUBLICATION

Cunha et al. 3D-printed microgels supplemented with dentin matrix molecules as a novel biomaterial for direct pulp capping. Clin Oral Investig 2022

INTELLECTUAL PROPERTY

PCT/US2018/035200 Dental Pulp Constructs

ANTICIPATED REGULATORY PATHWAY

510(k)

ANTICIPATED COMMERCIALIZATION STRATEGY

RegendoDent, Inc. was formed March 2022. We will continue to work with the MPWRM Resource Center Cores to define our market strategy.

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