

Immunomodulatory Strategies to Treat Periodontal Disease



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“This new class of treatments is extremely exciting in that organizing extraordinarily tiny amounts of proteins that are already found in the body seem to be capable of influencing the body’s own cells to repair the destructive inflammation that produces periodontal disease. To give perspective, it is possible to deliver millions of times less drug and achieve a better effect than the current gold standard.”



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Clinical Need

Periodontitis is one of the most pressing oral health concerns today, affecting nearly half of adults over age of 30 in the U.S. When left untreated, patients may require dental implants and bone grafting procedures. Antibiotics (killing of bacteria) are currently used as an adjunct therapy to scaling and root planing, which remain the current gold standard of care for periodontitis. However, with all medical practice shifting away from the overuse of antibiotics, new treatment modalities that address the host immune response responsible for most of the damage and disease progression are needed.

Solution

A team at the University of Pittsburgh led by Dr. Steven Little (PI) and Dr. Charles Sfeir, DDS (co-I) has developed non-antibiotic, controlled release microparticle systems that repair the underlying immunomodulation dysfunction responsible for tissue degeneration in periodontitis. The formulation recruits regulatory T cells to induce homeostasis and thereby reduce inflammation and destruction to promote tissue regeneration.

Competitive Advantage

By targeting the underlying immunoregulatory discourse in periodontitis (a treatment strategy that is disparate to current antibiotic adjunct therapy), a controlled release system is thought to overcome the current limitation in the treatment of periodontal diseases.

ITP Support

The goal of the work under the ITP program is to develop GMP-grade manufacturing and sterilization protocols to produce quality-controlled product for pharmacokinetic testing and toxicology studies in support of an FDA submission.

Clinical Translation Pathway

Publications: Glowacki et al. Prevention of Inflammation-Mediated Bone Loss in Murine and Canine Periodontal Disease via Recruitment of Regulatory Lymphocytes. [Proc Natl Acad Sci USA 2013](#)

Garlet et al. Restoring Host-Microbe Homeostasis via Selective Chemoattraction of Tregs. [J Dent Res 2014](#)

IP: US8,846,098 Artificial Cell Constructs for Cellular Manipulation

Anticipated regulatory pathway: IND

Anticipated commercialization strategy: In development with MPWRM Cores

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