



Oral Biolife Announces the Publication of a Pivotal Manuscript Demonstrating the Efficacy of PiezoGEL™ for the Treatment of Periodontal Disease In-Vivo

Oral Biolife is a biotechnology company committed to the discovery and development of pioneering therapies for the treatment of dental diseases for humans and companion animals. Today, we announce the publication of a manuscript entitled “A Novel Injectable Piezoelectric Hydrogel for Periodontal Disease Treatment” in the latest issue of *ACS Applied Materials & Interfaces*. This work demonstrated the ability of the Company’s lead asset, PiezoGEL™, to treat periodontal disease in a complex animal model.

Periodontal disease is a multifactorial, bacterially induced inflammatory condition characterized by the progressive destruction of periodontal tissues.

For the first time, in this study, an injectable piezoelectric hydrogel (PiezoGEL™) was developed after combining gelatin methacryloyl (GelMA) with biocompatible piezoelectric fillers of barium titanate (BTO) that produce electrical charges when stimulated by biomechanical vibrations (e.g., mastication, movements). PiezoGEL™ showed significant reductions in pathogenic biofilm biomass (~41%), metabolic activity (~75%), and the number of viable cells (~2–3 log) compared to hydrogels without BTO fillers in vitro. Molecular analysis related the antibacterial effects to be associated with reduced cell adhesion (downregulation of *porP* and *fimA*) and increased oxidative stress (upregulation of *oxyR*) genes. Moreover, PiezoGEL™ was demonstrated to significantly enhance bone marrow stem cell (BMSC) viability and osteogenic differentiation by upregulating *RUNX2*, *COL1A1*, and *ALP*.

Dr. Stella K. Vnook, MBA, PhD, Founder of Oral Biolife stated: “This is a great Proof of Concept that PiezoGEL™ is well positioned to potentially transform periodontal treatment, and potential other areas where bone regeneration and tissue growth are vital for recovery. The scientific inventors of this technology, Dr. Santiago Orrego, PhD, and Dr. Carolina Montoya, PhD, have done a prodigious job demonstrating how PiezoGEL™ effectively reduced periodontal inflammation and increased bone tissue regeneration compared to control groups in multiple mice models.”

Bill Breitenbach, CEO of Oral Biolife, commented: “We are very excited this study further confirms that PiezoGEL™ may be a most promising and novel therapeutic candidate for the non-surgical treatment of periodontal disease”.

This work provides further evidence that PiezoGEL™ is a potentially groundbreaking disruptive treatment for periodontitis due to its unique combination of antimicrobial and bone regeneration properties.

About PiezoGEL™

PiezoGEL™ is a piezoelectric hydrogel that is being developed for use in the treatment of periodontal disease, a common dental disease characterized by the formation of bacterial biofilms, inflammation, bone loss, and, if left untreated, loss of teeth. PiezoGEL™ utilizes the ability of naturally occurring

piezoelectric materials to generate small electrical charges to elicit a combined antimicrobial and bone tissue regenerative effect. Activation of the piezoelectric materials in PiezoGEL™ have now been demonstrated in a complex physiologic system to disrupt bacterial biofilms, prevent bacterial recolonization as well as stimulating the regrowth of the bone tissue that is lost due to periodontitis.

Advantages of PiezoGEL™:

- A cutting edge, fundamentally different product compared to existing non-surgical treatments /adjuvants
- PiezoGEL™ is an innovative, drug-free treatment that does not raise concerns regarding bacterial antibiotic resistance.
- Possess the unique ability to disrupt biofilms, prevent the recolonization of bacteria, and stimulate the regrowth of bone tissue without surgery
- Harnesses the benefits of piezoelectric particles and hydrogels (light-curable, conforms to pocket spaces, and it is biocompatible) eliciting the desired biological processes in the periodontal pocket that fight disease and generate tissue without surgery.
- PiezoGEL™'s bioactive effects have a long-term operation since electrical charges are not exhausted and do not require "re-charging"

About Oral Biolife

Oral Biolife is an innovative biotechnology company out of Temple University that utilizes the unique properties of Piezo materials to develop groundbreaking, first-to-market products. Their lead asset, PiezoGEL™, via its unique combination of antimicrobial and bone regeneration properties, represents a potential breakthrough advancement for the treatment of periodontal disease

The publication can be found at the following link:

<https://pubs.acs.org/doi/full/10.1021/acsami.3c08336>

Forward Looking Statements:

THIS PRESS RELEASE MAY CONTAIN FORWARD-LOOKING STATEMENTS AND INFORMATION RELATING TO, AMONG OTHER THINGS, THE COMPANY, ITS BUSINESS PLAN AND STRATEGY, AND ITS INDUSTRY. THESE FORWARD-LOOKING STATEMENTS ARE BASED ON THE BELIEFS OF, ASSUMPTIONS MADE BY, AND INFORMATION CURRENTLY AVAILABLE TO THE COMPANY'S MANAGEMENT. WHEN USED IN THE OFFERING MATERIALS, THE WORDS "ESTIMATE," "PROJECT," "BELIEVE," "ANTICIPATE," "INTEND," "EXPECT" AND SIMILAR EXPRESSIONS ARE INTENDED TO IDENTIFY FORWARD-LOOKING STATEMENTS, WHICH CONSTITUTE FORWARD LOOKING STATEMENTS. THESE STATEMENTS REFLECT MANAGEMENT'S CURRENT VIEWS WITH RESPECT TO FUTURE EVENTS AND ARE SUBJECT TO RISKS AND UNCERTAINTIES THAT COULD CAUSE THE COMPANY'S ACTUAL RESULTS TO DIFFER MATERIALLY FROM THOSE CONTAINED IN THE FORWARD-LOOKING STATEMENTS. INVESTORS ARE CAUTIONED NOT TO PLACE UNDUE RELIANCE ON THESE FORWARD-LOOKING STATEMENTS, WHICH SPEAK ONLY AS OF THE DATE ON WHICH THEY ARE MADE. THE COMPANY DOES NOT UNDERTAKE ANY OBLIGATION TO REVISE OR UPDATE THESE FORWARD-LOOKING STATEMENTS TO REFLECT EVENTS OR CIRCUMSTANCES AFTER SUCH DATE OR TO REFLECT THE OCCURRENCE OF UNANTICIPATED EVENTS

SUMMARY:

Oral Biolife, a biotechnology firm specializing in therapies for dental diseases, has announced the publication of a groundbreaking study in the journal ACS Applied Materials & Interfaces journal. The research highlights the efficacy of the company's primary asset, PiezoGEL™, an innovative injectable piezoelectric hydrogel. The study demonstrated PiezoGEL™'s capability to effectively treat periodontal disease in animal models, showcasing significant reductions in pathogenic biofilm and promoting bone tissue regeneration. Founders and scientific experts laud the hydrogel's potential as a transformative solution for non-surgical periodontal treatment, emphasizing its unique antimicrobial and bone regeneration properties.

PULL QUOTE:

This study further confirms that PiezoGEL™ should be a most promising and novel therapeutic candidate for the non-surgical treatment of periodontal disease.

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