Meet the 2018 American Academy of Periodontology's **SUNSTAR Innovation Grant recipients**

Started in 2017, the AAP's SUNSTAR Innovation Grant is a member benefit to support member research and promote innovative periodontal treatment. Over three years, the $250,000 grant program will be divided among six winning principal investigators, who are engaged in research that aims to identify novel and innovative evidence-based periodontal treatment approaches to enhance patient care.

This year's winners, both from the University of Michigan, are Hsun-Liang (Albert) Chan and Jeff CW Wang. *Periospectives* asked them about their winning research and their inspiration.

SUNSTAR

Hsun-Liang (Albert) Chan, DDS, MS – University of Michigan, Ann Arbor, MI

In-Situ Evaluation of Periodontal Inflammation with Ultrasonography

What is the goal of your research?

The primary aim of my research is to apply innovative ultrasound imaging technology to evaluate periodontal inflammation in a preclinical model. The long-term goal is to develop a point-of-care device for diagnosing and monitoring periodontal inflammation. There are some quantitative ultrasound parameters, e.g. fractional blood volume, oxygen fraction, and elastic scatterer size, etc., that have been developed for estimating tissue inflammation in the brain, liver, gastrointestinal system, joints, and elsewhere. Gingiva is relatively thin in dimension and would be a great indication for high-resolution ultrasonography.

What will this grant allow you to accomplish that you wouldn't have been able to do otherwise?

This seed grant will allow our team to collect critical pilot data for future larger scale grant applications. Our research team has extensive experience in anatomical analysis of periodontal as well as peri-implant tissues with ultrasound. This research will advance our ability to perform functional imaging of periodontal tissues. This grant will also help us to understand the applicability of ultrasound for periodontal diagnosis as routine patient care. I appreciate the generous support of SUNSTAR and AAP for this important study.

What inspired the start of your research?

My key research collaborator, Dr. Oliver Kripfgans, research associate professor at the department of radiology, University of Michigan Medical School and I have worked on ultrasonography for dental applications for several years. We run together almost every week, discussing life, family, and also science. We came up with this idea one time while jogging together. I also want to take this opportunity to acknowledge the great support given to me to pursue dental ultrasound research, from Dean Dr. Laurie McCauley, Research Dean Dr. Russell Taichman, Department Chair Dr. William Giannobile, and others. Dr. Yu L. Lei, assistant professor at our department has also inspired me for this work. He will be the key investigator to assist in evaluating periodontal inflammation at the molecular level.

Jeff CW Wang, DDS, DMSc – University of Michigan, Ann Arbor, MI

Development of Patient-Friendly Oral Health Report with Customized Oral Hygiene Instructional Video for Enhanced Patient Education Modalities

What is the goal of your research?

The goal of this study is to enhance both student and patient education through patient-friendly reports and technology-based visual aids. The outcome of periodontal treatment highly depends upon effective patient education to improve motivation and compliance. It is also important for both future dentists and patients to understand beyond the limitation of scaling and root planing and thus to include effective oral hygiene therapy and modifying all systemic and local contributing factors as an integral part of the periodontal treatment. Patient education with a personalized emphasis on their unique needs is the key for patient acceptance, and ultimately achieving the goal of long-term periodontal health stability.

This pilot study is one step towards future personalized precision patient education, using a tailored oral and periodontal health report as a platform to educate patients about their own clinical, periodontal, and radiographic findings, including factors that may have impacted their periodontal conditions in a patient-friendly manner. The report will also include an innovative visual aid entitled "plaque control heat map" that is linked to a customized "in-their-mouth" instructional video that specifically addresses their "hot spots" (worse plaque accumulation/inflamed area/s).

In general, the goal of this pilot project is to educate patients to have a clear understanding of the etiologies pertinent to their specific periodontal condition and to enhance their appreciation of the improvement throughout the non-surgical treatment process. It is also our hope that this project will evolve as a powerful tool that can be used to educate the public about their right to request their personal health records and learn about their conditions. Particularly through increasing patients' awareness and knowledge on periodontal and radiographic findings, we can empower the public to understand and potentially to escalate the quality of the dental work they receive.

What will this grant allow you to accomplish that you wouldn't have been able to do otherwise?

Although the effectiveness and impact of such an initiative is only a matter of optimization, it is still crucial to test the feasibility and efficacy in a controlled and scientific manner. Without the support from the AAP's SUNSTAR Innovation Grant, conducting a clinical trial in a predoctoral teaching clinic is impossible. It really helps us to launch this project with more organized and momentous effort. We will also be able to disseminate the information and methods for a more general and sustainable impact.

What inspired the start of your research?

This research started with an initiative on customized oral hygiene therapy within the predoctoral and dental hygiene programs at the school that gradually evolved toward an expanded concept of personalized patient education. It is intriguing that all the components of comprehensive non-surgical periodontal treatment, including patient education and other restorative treatment planning are highly interconnected. However, this complex relationship and process may be a challenge for a dental or hygiene student to navigate and appreciate in the two years spent in a teaching clinic, let alone a fast-paced general private practice after graduation.

I believe integrating personalized precision patient education into the curriculum can place a seed that can potentially flourish into different aspects and in turn positively influence our future general practice. It is very likely that the more the dental students practice on educating patients regarding all the factors that contribute to periodontal disease, the better they will appreciate these details. In addition, most of the patients will truly appreciate the knowledge, quality treatment, and new skills they learn to maintain their oral health, which indeed creates a sustainable positive energy cycle for our future dentists.

As an educator, while I completely understand the importance of enabling student exposure to the latest technology and surgical skills in the field of dentistry or implant therapy, I firmly believe that it may even be more critical to focus on the student's intrinsic motivation to provide oral "health" care and treat patients as a whole. Maybe the idealistic world will never exist, but this study is just a start. We hope we will be able to generalize this initiative to promote personalized precision patient education on oral and periodontal health as a standard of care in the near future and to seed a hope for the future of periodontics.

Drs. Hsun-Liang (Albert) Chan and Jeff CW Wang will present the work they've completed at a future AAP Annual Meeting. Thanks to SUNSTAR for supporting the AAP's SUNSTAR Innovation Grant. ■

Are you interested in submitting your research proposal to be considered for the next AAP's SUNSTAR Innovation Grant?

Applications will be accepted in fall 2018. For more information, contact Project Coordinator Maggie Matamoros at **800-282-4867**, ext. **3269** or **312-573-3269** or email **maggie@perio.org**.