PERIO RESEARCH COLLABORATION

PERIODONTAL DISEASE PREDICTS MAJOR ADVERSE CARDIOVASCULAR EVENTS

A group of Forsyth Institute and Harvard School of Dental Medicine scientists have found that people with periodontitis are at higher risk of suffering major cardiovascular events, according to recently published papers in the Journal of Periodontology and the Journal of American College of Cardiology Imaging. Drs. Thomas Van Dyke and Karim El Kholy, from the Forsyth Institute and our Department of Oral Medicine, Infection and Immunity, collaborated with Dr. Ahmed Tawakol and colleagues, from the Cardiology Division of Massachusetts General Hospital in a longitudinal study that demonstrated that oral inflammation associated with active gum disease was predictive of arterial inflammation, which can cause heart attacks, strokes, and other dangerous manifestations of cardiovascular disease.

The research team used positron emission tomography and computer tomography (PET and CT) scans on 304 individuals to visualize and quantify inflammation in the arteries and gums of each patient. In follow-up studies approximately four years later, 13 of those individuals developed major adverse cardiovascular events. Periodontal inflammation was found to be predictive of major adverse cardiovascular events, even after the investigators controlled for other risk factors, such as smoking, high blood pressure, obesity, and diabetes. Furthermore, researchers found that a history of periodontal disease was not associated with an increased risk in cardiovascular events. Patients who did not have actively inflamed gums had a lower risk of cardiovascular disease—even if those individuals had a prior history of periodontal disease as evidenced by periodontal bone loss on their reconstructed CT scans. The hypothesized mechanism linking periodontal inflammation and cardiovascular disease was published in the Journal of American College of Cardiology Imaging. Local periodontal inflammation activates and mobilizes cells signaling through bone marrow, which triggers the inflammation of arteries, leading to major adverse cardiovascular events.

The results are substantial and suggest that patients who are at risk of cardiovascular disease, or currently suffering from cardiovascular disease, should be regularly screened and treated if necessary for periodontal disease to decrease their risk of developing threatening cardiovascular events.
FACULTY FEATURE

ROSALYN SULYANTO

Congratulations to Dr. Rosalyn Sulyanto who was recently promoted to assistant professor of Developmental Biology and Associate, Department of Dentistry, Boston Children’s Hospital.

Dr. Sulyanto graduated with a double major in bioengineering and materials science and engineering from University of California, Berkeley and received her DMD degree with research honors from Harvard School of Dental Medicine in 2011. While at Harvard, she conducted research on osteoclast development as a Howard Hughes Medical Institute Fellow.

She then completed her residency in pediatric dentistry at Nationwide Children’s Hospital/The Ohio State University and was awarded a masters degree. In 2014, Dr. Sulyanto joined the faculty at Boston’s Children’s Hospital (BCH) and the Department of Developmental Biology at HSDM, and became the director of post-doctoral research at BCH in 2017. Since joining the faculty, Dr. Sulyanto has mentored/co-mentored more than 20 pediatric dental residents and dental students, several of whom have earned national recognition for their research accomplishments.

Her research interests include the prevention of early childhood caries and the oral microbiome. Among other publications, her research on sealants on primary molars was featured as the cover of the August 2019 Journal of the American Dental Association issue. Her research on the dominant structure of the infant oral microbiome and how it establishes early, suggesting that it persists throughout life, was published in the July 2019 Scientific Reports.

Currently, Dr. Sulyanto is conducting translational research to elucidate the microbial and microstructural mechanisms of action of silver diamine fluoride as well as microbiota associated with odontogenic infections. Her research mentors include Dr. Man Wai Ng, dentist-in-chief, department of dentistry at Boston’s Children’s Hospital, associate professor of Developmental Biology at HSDM; Dr. Ann Griffen, professor of pediatric dentistry at The Ohio State University, and Dr. Sunita Ho, professor of preventive and restorative dental sciences at the University of California, San Francisco.


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Sandhu S, Sankar V. Osteonecrosis of the jaw secondary to haematopoietic stem cell transplantation. BMJ Case Reports 2021;4;14(3).


ORAL HEALTH POLICY AND EPIDEMIOLOGY


ORAL AND MAXILLOFACIAL SURGERY


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**MULTI DEPARTMENTAL**


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**Francesca Gori Receives Burton C. Borgelt/SCADA Faculty Award**

Congratulations to Dr. Francesca Gori, assistant professor of Oral Medicine, Infection and Immunity, program director for the Harvard Forsyth Research Academy, and director of predoctoral research at HSDM. Dr. Gori was chosen by the Board of Directors of the Student Competition for Advancing Dental Research and its Application (SCADA) as the 2021 Burton C. Borgelt/SCADA Faculty Advisory Award recipient. This award honors a faculty advisor who has distinguished herself as a dental scientist and has had a significant impact on the lives of dental students as a research mentor. Dean Giannobile noted, “Dr. Francesca Gori is an instrumental and inspiring member of the faculty, contributing significantly to both the Advanced Graduate Education, and DMD students’ education in both basic science research and didactic instruction.”
HSDM SCIENCE SPEAKER SERIES

Zoom links will be announced a week prior to the 12 – 1 pm talks.

MAY 13, 2021
Yi-Xian Qin PhD
Professor and Chair of Biomedical Engineering, Stony Brook University
“Bone Adaptation via Dynamic Loading and Piezo1 Mechanotransduction”

JUNE 10, 2021
Michael Longaker, MD, MBA
Professor and Vice Chair of Plastic and Reconstructive Surgery, Co-Director, Institute for Stem Cell Biology and Regenerative Medicine, Stanford University

SEPTEMBER 9, 2021
Benjamin Wu, DDS, PhD
Professor and Chair of the Division of Advanced Prosthodontics, Director of the Weintraub Center for Reconstructive Biotechnology, University of California, Los Angeles

OCTOBER 7, 2021
Lynda F. Bonewald, PhD
Distinguished University Professor, Anatomy, Cell Biology, Physiology and Orthopaedic Surgery, Indiana University

NOVEMBER 18, 2021
Tamara Alliston, PhD
Professor of Orthopaedic Surgery, Department of Medicine, University of California, San Francisco

DECEMBER 9, 2021
Jean X. Jiang, PhD
Professor and Zachary Distinguished University Chair, Department of Biochemistry and Structural Biology, University of Texas at San Antonio

2021-22 Osteology Foundation Fellow

Young Woo Song, DDS, PhD, clinical and research assistant professor, Department of Periodontontology at Yonsei University College of Dentistry in South Korea, joined HSDM this past March. Dr. Song is currently a Research Fellow in the Nagai/Kim/Da Silva Lab in the Department of Oral Medicine, Infection and Immunity through February 2022.

Dr. Song, an Osteology Foundation Fellowship recipient, plans to work on a broad spectrum of research projects in the field of oral and maxillofacial regeneration including in vitro, in vivo, and clinical studies. Specifically, he will be working on: 1) Establishing biomimetic interface of peri-implant soft tissues; Basal lamina-mediated epithelial attachment and perpendicular ligamentous barrier at the epithelial junction; 2) A novel paradigm for blood brain barrier-independent molecular passage to the brain: Retrograde axonal transit of craniofacial tissue exosome; and, 3) Pathological and physiological roles of a novel alternative splicing variant of receptor activator of NF-kappa B, soluble RANK (sRANK), in bone, CNS and immune systems.

Dr. Song’s recent work includes: 1) Bone augmentation using small molecules with biodegradable calcium sulfate particles in a vertical onlay graft model; 2) Locally applied slow-release of minocycline microspheres in the treatment of peri-implant mucositis; 3) Bone morphogenetic protein-2 solution in damaged extraction sockets; and, 4) Clinical benefits of ridge preservation for implant placement compared to natural healing in maxillary teeth.

“I am deeply interested in newly-developed materials related to periodontal and peri-implant tissue regeneration. It is my great honor and pleasure to have an opportunity to work with the research team of Drs. David Kim, Shigemi Nagai, and John Da Silva at HSDM.”
Collaborative Project Led by Dr. Ana Andradal
Receives 2021 Journal of Endodontics’ Award

The Editorial Board of the Journal of Endodontics recently announced the winners of the 2021 JOE Awards. The JOE Publication Awards are presented to authors of published papers in the Journal of Endodontics that represent innovative thought and significant advances in the endodontic field.

The purpose of the study, “Immunomodulation Mediated by Azithromycin in Experimental Periapical Inflammation” was to compare the immunomodulatory effect of azithromycin (AZM), ampicillin (AMP), amoxicillin, and clindamycin in vitro and AZM on preexisting periapical lesions compared with AMP. The study showed that AZM led to the resolution of preexisting experimental periapical inflammation. Data provided a perspective on host response in antibiotic selection for endodontic treatment. However, well-designed clinical trials are necessary to better elucidate the benefits of AZM as an adjunctive therapy for endodontic treatment when antibiotic therapy is recommended. Although both AZM and AMP were effective on preexisting periapical lesions, AZM led to advanced wound healing, probably depending on its immunomodulatory effect.

The Basic Research Award went to Drs. Ana Cristina Andradal (Detroit Mercy Dental), Mariane Maffei Azuma (Michigan), Hisako Furusho (Hiroshima University), Kimito Hirai (Michigan), Shuang Xu (Forsyth), Robert White (HSDM), and Hajime Sasaki (Michigan) for their project, “Immunomodulation Mediated by Azithromycin in Experimental Periapical Inflammation.” This work was Dr. Andradal’s DMSc thesis project while at HSDM.