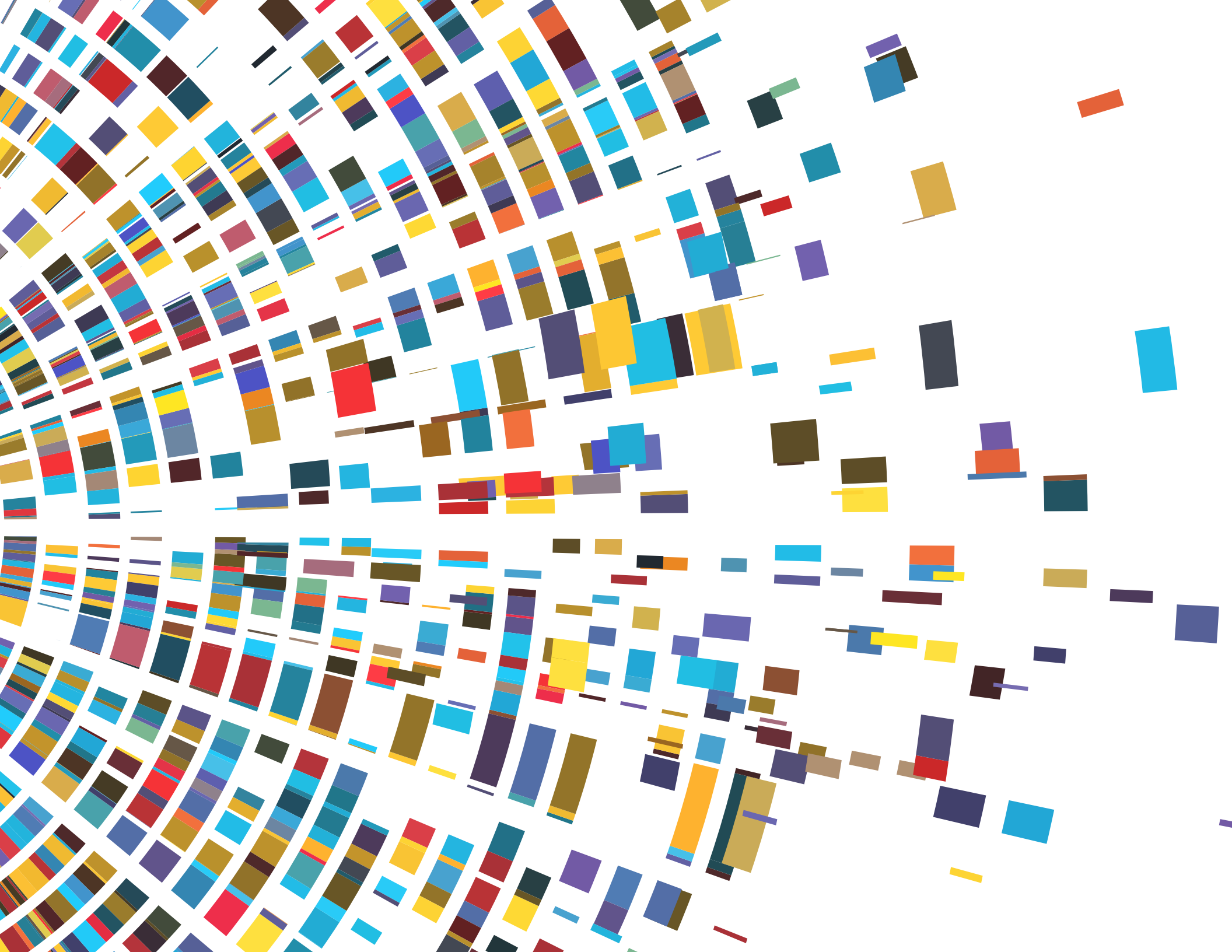




UNIVERSITY OF PITTSBURGH SCHOOL OF DENTAL MEDICINE

RESEARCH SYMPOSIUM

NOV. 14
2024



Dean's Welcome

It is my great privilege to welcome you to the Pitt Dental Medicine 2024 Research Symposium. It is a proud highlight of the University of Pittsburgh School of Dental Medicine and an excellent avenue for celebration and recognition. Since its 2000 inception, I look forward to it and believe that we have more to celebrate each year. I see this occasion not only as a recognition of our research success, but also as a jumping off point for the great things that we will achieve in the future through research, education, and patient care.

As always, with this event, we turn our attention to not only the achievements of our researchers, but also to the vital role that our students and clinicians have in the realization of our goal of being an institution dedicated to offering the best clinical dentistry and craniofacial biology research possible. The intersection of research, academics, and patient care is crucial in how each supports and feeds into the success of the another's.

Recently, becoming the dean of our school has given me the opportunity to view our

research programs from a different perspective, and I am eager to expand the impact and scope of our research. The research performed here is key to achieving preeminence as a schools and we are well on our way to making that vision a reality because of the substantial innovations and discoveries made by our team of exceptional researchers. Those efforts not only solidify our status among top institutions but show great promise for improving the oral and craniofacial health of individuals throughout the world. We are creating an impact worldwide.

I encourage everyone to take this day as an opportunity not only to learn about our latest advances, but to consider how research and innovation relate to you and enrich the lives of others.

Our profession shares the common goal of improving the health and quality of life for individuals. It is this aim that ultimately drives our research enterprise—at its heart, our research is about striving to better the lives



of as many as we can. This is the secret to our success as researchers, scholars, teachers and clinicians. It is evident in the passion with which those at Pitt Dental Medicine provide care and pursue innovative discoveries—and I am proud to be a part of it.

Marnie Oakley, DMD
Dean

Associate Dean's Welcome



Dear Pitt Dental Medicine friends,
I am honored to welcome you to the Pitt Dental Medicine 2024 Research Symposium. This year, we are fortunate to be able to highlight many successes we have realized in both our clinics and research areas. To share these exciting advancements, we will present to you compelling clinical and basic research as a way to showcase the research that is impacting patient care the most—and the research that we do best.

We have much to celebrate this year and this event is a great opportunity to learn about how the dental field is rapidly advancing toward a bright future.

Research is unquestionably a priority at Pitt Dental Medicine—as demonstrated by our consistent top ranks for National Institute of Dental and Craniofacial Research (NIDCR) funding. Our prominence as a research institution does much more, however, than

establish our standings in the national rankings—it advances the field and, most importantly, improves the lives of our patients.

Our research program is one of our school's biggest assets. Together, we realize this through the collaborative and innovative approaches undertaken by our faculty. Our collaborative research spans basic sciences through translational research—evidenced by the many funded research projects at Pitt Dental Medicine.

Our symposium today is designed to celebrate the achievements of our investigators, introduce to clinicians the latest advances, and support our students as they make their way into the exciting worlds of both patient care and research.

Below are some of our highlighted programs:

- The Restoring Joint Health and Function to Reduce Pain (RE-JOIN) Consortium is part of the Helping to End Addiction Long-term® Initiative, or NIH HEAL Initiative®. RE-JOIN will bring together multiple research teams

to create 3-D maps of the different types of sensory neurons found in two important joints of the body: the knee and the temporomandibular joint (TMJ)

- The Syed-Picard research program utilizes dental stem cells and scaffold-free tissue engineering approaches to develop biomimetic, cell-driven technologies that will regenerate dental and craniofacial organs, including the complex tooth root and the facial nerve.

Our research programs expand and build upon the research strengths at Pitt. Being part of a research-intensive institution and sharing in our collaborative spirit is a privilege for me and the research faculty, clinicians, and students who are passionate about discoveries we make each day. Our aim is not only to share knowledge, but enhance the bonds between us as scientists, clinicians, and dentists.

Today's symposium celebrates the achievements of our investigators, introduces to clinicians our latest advances, and supports

our students as they make their way into the exciting worlds of both patient care and research.

It is a great pleasure to welcome our keynote speaker, Dr. Anibal Diogenes, whose innovative approach to clinical research is an inspiration to many.

Together, we keep our sights focused on a vision of innovation and excellence encompassing our school's teaching, service, and research, to better understand the inner workings of dental genetics, pioneer new technologies and improve our clinical practice as a point of pride for us all.

Our symposium today is designed to celebrate the achievements of our investigators, introduce to clinicians the latest advances, and support our students as they make their way into the exciting worlds of both patient care and research.



Research Symposium 2024 Agenda

8:30-9:00am	Breakfast	10:30 – 10:45am	Pitt Research Highlights Charles Sfeir DDS, PhD, and Mary Marazita, PhD
9:00-9:15am	Opening Remarks and Introduction to Program Marnie Oakley DMD, <i>Dean</i> <i>University of Pittsburgh</i> <i>School of Dental Medicine</i> Charles Sfeir DDS, PhD, <i>Associate Dean for Research</i> <i>University of Pittsburgh</i> <i>School of Dental Medicine</i>	10:45 – 11:00am	Efficacy of Surgical Surface Decontamination Methods on Peri-implantitis-affected Implants: A Randomized Clinical Trial Mahboube Hasheminasab, <i>Resident</i> <i>Department of Periodontics,</i> <i>University of Pittsburgh School of Dental Medicine</i>
9:15-10:15am	Keynote Presentation: Neurophysiology Of Pulpal and Apical Inflammation Anibal R Diogenes, DDS, MS, PhD <i>Chair, Department of Endodontics</i> <i>University Of Texas Health Science Center</i> <i>At San Antonio</i> <i>Director, American Board of Endodontics</i>	11:00 – 11:15am	Gene-by-Environment Interactions with Maternal Smoking and Vitamin Intake Impact Cleft Risk Zeynep Erdogan-Yildirim, <i>Postdoctoral scholar trainee</i> <i>University of Pittsburgh School of Dental Medicine</i>
10:15 – 10:30am	Break	11:15 – 11:30am	A Local Immunomodulatory Strategy for Preventing Peri-implantitis Yejin Cho, <i>DMD student and PhD candidate</i> <i>University of Pittsburgh School of Dental Medicine</i>
		11:30 – 11:45am	Tooth Root Organoids as a Novel Platform to Study Repair Processes and the Tooth-Bone Interface Tia Christine Calabrese, <i>PhD candidate</i> <i>University of Pittsburgh School of Dental Medicine</i>
		11:45am – 12:15pm	Student Research Awards Presented by Charles Sfeir, DDS, PhD
		12:15 – 1:00pm	Luncheon
		1:00 – 3:00pm	Poster Viewing

Meet Our Keynote Speaker

"RESEARCH DAY" - NEUROPHYSIOLOGY OF PULPAL AND APICAL INFLAMMATION

Dr. Anibal Diogenes received his dental degree from UFPE in Brazil, his M.S. in molecular biology from the University of Nebraska, and his Ph.D. in pharmacology. He also earned a certificate in endodontics from the University of Texas Health Science Center at San Antonio.

Dr. Diogenes' areas of research include the study of inflammation, pain, and regenerative endodontics. He received the International Association for Dental Research (IADR) Distinguished Research Award, the AAE Osetek Award, and the Minnie Stevens Piper Foundation Professorship Award. Dr. Diogenes maintains a clinical practice limited to Endodontics in San Antonio, Texas.

His presentation today will review the current neurophysiology knowledge while providing new lines of evidence and their clinical translational significance. Dr. Diogenes will discuss the emerging body of evidence that challenges existing knowledge on pulpal nociception, the role of nociceptors in homeostasis, and their response to injury. It has become clear that these pain-sensing fibers have multiple roles that far exceed nociception through elaborate crosstalk with other cells of the pulp dentin complex and the periodontium. Moreover, pulp injury and endodontic infection lead to remarkable changes in neuronal phenotype that may underlie multiple clinical challenges in intra- and post-operative pain management and persistent symptoms following adequate endodontic treatment.



Anibal R. Diogenes DDS MS PhD

Chair, Department of Endodontics
University of Texas Health at San Antonio

Director, American Board of Endodontics

MAKING MOVES TO BETTER UNDERSTAND ORTHODONTIC MOVEMENT

Ildeu Andrade Jr. DDS MS PhD



An orthodontic researcher at the University of Pittsburgh School of Dental Medicine is working on multiple projects aimed at reducing orthodontic treatment time and increasing patient comfort.

Ildeu Andrade Jr., PhD, DDS, is an associate professor and a clinical director in the Department of Orthodontics and Dentofacial Orthopedics. He focuses on basic biology to explore the cellular and molecular mechanisms of bone remodeling, aiming to enhance understanding of orthodontic tooth movement. He also develops more efficient orthodontic appliances. Both efforts seek to provide orthodontists with greater control over dental and skeletal changes caused by orthodontic forces.

One of his projects was recently awarded a \$20,000 grant from the American Association of Orthodontists Foundation

(AAOF). The randomized, controlled trial compares dentoskeletal outcomes in patients treated with traditional maxillary expanders and 3D-printed metal maxillary expanders.

With the traditional method of laboratory fabrication, an orthodontist must take an impression and use separators to create spaces between the teeth. Both processes can be uncomfortable and unpleasant for patients and require additional visits. However, with 3D-printed expanders, spacers are not required, a scan replaces the impression, and fewer appointments are required.

“The way this appliance is supported in your mouth—we use the teeth to create pressure in the bone. Because the appliance is anchored to the teeth, they tend to tip, and this is a side effect we want to avoid. We believe that the greater rigidity of the 3D-printed expander

can prevent this tipping, enhancing skeletal changes.” Moreover, Dr. Andrade is studying patients’ perceptions regarding quality of life and pain. He hypothesizes that 3D-printed expanders will cause less pain and discomfort to the patients. He hopes to have data in mid-2025 and is slated to present a research update at next year’s meeting of the Edward H. Angle Society of Orthodontics.

A second project of Dr. Andrade’s aims to optimize the diagnosis of transverse dimension of the maxilla and mandible. “There can be a transverse discrepancy between the two jaws,” he explained. This can cause a narrow upper jaw, posterior crossbites, and/or facial asymmetry. Diagnosis can be challenging and is often delayed. “Sometimes there is a dental compensation that masks the skeletal transverse discrepancy. We are using artificial intelligence to evaluate the jaws in 3D to provide a quick diagnosis of this

transverse dimension,” Dr. Andrade said. He and his team, along with collaborators at the Medical University of South Carolina in Charleston, are creating a machine learning algorithm to guide clinicians in the diagnosis and treatment planning of the transverse discrepancy between the jaws, using cone-beam computed tomography images. He expects to have results to report in 2025.

Finally, Dr. Andrade recently submitted a grant proposal to the National Institutes of Health to support a project exploring the role of kinin receptors in bone remodeling under mechanical loading in an animal model. “Our preliminary data suggest that they might influence osteoclastogenesis and bone resorption processes during orthodontic tooth movement. The ultimate goal is to develop pharmacological agents that could enhance osteoclast differentiation and activity, thereby expediting orthodontic tooth movement.”

Dr. Andrade earned his doctor of dental surgery degree from Pontifical Catholic University of Minas Gerais, Brazil in 1995, followed by his orthodontic certificate and his master’s degree in 2002 from Marquette University, then his PhD in cellular biology in 2007 from the Federal University of Minas Gerais, Brazil. Before coming to Pitt, he served as an associate professor and program director of the Department of Orthodontics at the Medical University of South Carolina in Charleston, South Carolina. Before that role, he was an associate professor and head of the craniofacial team at Pontifical Catholic University, and he had a private practice in his hometown of Belo Horizonte for more than 20 years.

USING MULTIOMICS RESEARCH TO INVESTIGATE THE ORIGINS OF ORAL DISEASES AND THEIR IMPACT ON GENERAL HEALTH

Mariana Bezamat DDS PhD



Mariana Bezamat, DDS, PhD, focuses her research on the connections between oral health and general health—using dynamic models called multiomics.

“Multiomics is a relatively new field that is, in my opinion, changing the way we perceive each disease as an isolated condition,” she said. “How can environmental, lifestyle factors, genomics or bacterial profiles explain some phenotypic traits? How are they involved with a set of conditions that a patient can have, both in their mouths and throughout their bodies? If we can uncover those profiles, we can improve precision medicine and precision dentistry.”

Her work is finding connections between oral health and conditions such as cardiovascular disease and cancer.

Previous research has shown an association between periodontal and cardiovascular disease, but the mechanisms behind the relationship are unclear. Recently, Dr. Bezamat

and colleagues published their work in *JDR Clinical & Translational Research*, where they identified a metabolite that overlaps between periodontal disease and subclinical atherosclerosis. More specifically, they found that a sphingomyelin metabolite was inversely associated with gingivitis and carotid intima media thickness, a subclinical marker of atherosclerosis.

Continued analyses are looking to see whether the same genes associated with oral phenotypes overlap with atherosclerosis, particularly coronary artery calcium and carotid intima media thickness. The work involves collaboration with Dr. Mary Marazita, Distinguished Professor in the School of Dental Medicine; Dr. Steven Reis, Distinguished Service Professor in the Pitt School of Medicine; and the Pittsburgh Clinical and Translational Science Institute. It is supported by a grant from the PRIDE CVD-CGE program, funded by the National Heart, Lung, and Blood Institute.

A subsequent study by Dr. Bezamat's lab in collaboration with Dr. Daniel Clark, assistant professor at Pitt Dental Medicine, identified that salivary biomarkers of atherosclerotic cardiovascular disease were increased in patients with periodontal disease and discovered that levels of those biomarkers came down after treatment for periodontal disease.

They studied saliva samples of 44 patients before and after treatment for periodontal disease, as well as existing samples from a larger group of 877 research participants. The genotype analysis looked for markers of cardiovascular disease. The genetic marker was more frequently seen in individuals with periodontal disease compared to healthy controls. After treatment for periodontal disease, patients had significant decreases in proteins CD14, C-reactive protein, D-dimer, and ICAM-1 in saliva.

"This supports the hypothesis that genetic predisposition could exacerbate periodontal disease, leading to increased systemic inflammation and potentially contributing to the development or progression of atherosclerotic cardiovascular disease, but it also demonstrates that prompt dental treatment decreases this inflammation."

Eventually, one goal would be to identify biomarkers that indicate increased risk of

particular conditions, allowing medical professionals and patients to mitigate risk, more accurately screen for disease, and identify and treat diseases earlier.

"Perhaps certain bacteria are more prevalent with specific genetic profiles, and this may lead to overall increased susceptibility for certain diseases. The overall goal of my research is to understand those profiles," she said. "If we can decrease the risk of disease by treating inflammation in the mouth, we could impact health in very meaningful ways. And early identification and detection allow us to either prevent or treat disease earlier for better outcomes."

Dr. Bezamat will be submitting a grant proposal for the National Institutes of Health (NIH) to study connections between inflammatory tongue conditions and subsequent development of tongue cancer. Patients who develop tongue cancer often have a history of inflammatory tongue conditions. If awarded, she plans to use whole genome sequencing of patients who have inflammatory tongue conditions to understand how inflammatory conditions could maybe lead to or be associated with later cancers.

A biobank of saliva samples housed at the School of Dental Medicine has information on over 600 people who have reported

inflammatory tongue conditions. She plans to conduct oral microbiome analysis and the multiomics approach to correlate bacteria with the inflammatory tongue conditions. Working with the UPMC Hillman Cancer Center, she and her team plan to recruit patients with tongue cancer and conduct similar analyses for comparison. In addition, the study plans to use data from the All of Us Research Program, which is collecting genetic and health data from 1 million volunteers, for a group of healthy controls.

"It's like mapping the pathogenesis of tongue cancers," she explained. Another goal of the study will be to determine whether any demographic characteristics or lifestyle factors affect risk. For example, she suspects there may be a higher risk among people who vape or who take certain medications.

Dr. Bezamat joined Pitt Dental Medicine in 2021, after earning her PhD here in oral and craniofacial sciences and a postdoctoral fellowship with the Pitt Clinical and Translational Sciences Institute. She holds a doctor of dental surgery degree and a certificate in pediatric dentistry from Federal University of Rio de Janeiro in Brazil, as well as a certificate in endodontics from the Pontifical Catholic University in Brazil.

USING PERIODONTAL DISEASE TO UNDERSTAND INFLAMMAGING

Daniel Clark DDS MS PhD



A Pitt Dental researcher believes that periodontal disease is the perfect model for studying inflammaging, an important emerging concept in medicine that has the potential to change the understanding and management of many chronic, debilitating conditions.

Inflammaging is defined as an age-related increase in levels of proinflammatory markers in blood and tissues. It is a strong risk factor for multiple diseases that are prevalent in older individuals but do not appear to be pathophysiologically associated. Examples include atherosclerosis, osteoarthritis, and Alzheimer disease.

“We’re all quite familiar with age-related diseases and conditions that increase in prevalence as we age. When you look at them as a whole, underlying them all is some dysregulated inflammatory component. Age-related changes can perturb or disrupt the

inflammatory response, and this has been well appreciated across dental and medical fields,” said Daniel Clark, DDS, MS, PhD, faculty in the Department of Periodontics and Preventive Dentistry. “Trying to understand this age-related perturbation of inflammation may lead to a better understanding of these age-related diseases and conditions.”

He is using periodontal disease to study this concept because it is a chronic inflammatory condition that increases in prevalence with age. He believes that it can help elucidate at cellular and molecular level the changes that occur in age-related inflammation. Furthermore, obtaining samples for study is much less invasive in periodontal disease than in other inflammatory conditions, he explained. The research depends on samples of saliva rather than blood, cerebrospinal fluid, or cells from biopsy.

Dr. Clark's lab focuses on a particular cell called the macrophage, which is prevalent in periodontal disease, and how it is affected by age-related perturbations. His recent work suggests that "age-related changes to the macrophage appear to be detrimental to the recovery from disease and may explain, in part, the age-related increase in prevalence of periodontal disease."

His research into macrophages in periodontal disease has been inspired by findings in Alzheimer's disease.

"Periodontal disease and Alzheimer's disease have an epidemiologic association, with periodontal disease shown to be a risk factor for Alzheimer's disease. The question, of course, is why is there a connection between two seemingly distinct conditions?" he asked. "We've been informed by our pathological understanding of Alzheimer's disease about potential cellular perturbations in periodontal disease."

In Alzheimer's disease, research has focused on a molecule on macrophages called TREM2, or triggering receptor expressed

on myeloid cells 2, a protein which has been implicated in chronic inflammation. Dysfunction of TREM2 appears to contribute to Alzheimer's disease. Dr. Clark and his lab are the first to study TREM2 in periodontal disease and utilize mouse models of both periodontal disease and Alzheimer's disease in order to study the pathophysiology of both conditions simultaneously. His line of inquiry utilizes flow cytometry and single-cell RNA sequencing, which can drive disease research down to the cellular level and reveal the mechanisms that make a cell run or become dysfunctional.

"If we can show the same pathologic perturbations at a cellular level across two distinct conditions, then we're getting to a basic level of understanding of the age-related dysfunction that contributes to disease. And that, of course, is kind of the Holy Grail to find and target an age-related change that could affect multiple conditions," he said.

In the meantime, Dr. Clark wants people to appreciate the importance of oral health in systemic health and healthy aging.

"We talk about lifestyle strategies and activities that can contribute to healthy aging. If you tell a dentist that maintaining proper oral hygiene would be a strategy for healthy aging, they may not be surprised, but that's still a fairly novel idea to the general public and in aging research," Dr. Clark said. "By showing these basic cellular and molecular understandings that link oral health to systemic health, we can drive home that point: Oral health is essential to healthy aging."

Dr. Clark received his PhD from the University of California San Francisco and his doctor of dental surgery degree from the University of Michigan School of Dentistry, then completed residency in periodontology at the University of California San Francisco. His work is supported by a K08 grant from the National Institutes of Health and collaborates with Nicholas Fitz, PhD, at the University of Pittsburgh School of Public Health.

IDENTIFYING NOVEL GENES RESPONSIBLE FOR PIERRE ROBIN SEQUENCE AND CLEFT PALATE

Alice Goodwin DDS PhD



A School of Dental Medicine researcher has found genetic evidence in vivo that shows that a dysmorphic mandible can cause cleft palate.

“My research is interested in craniofacial anomalies and understanding the biology underlying craniofacial anomalies, trying to understand what happens normally in craniofacial development and then how it goes wrong. I’m focused on the development of two structures: the mandible and the palate,” said Alice Goodwin, DDS, PhD, an assistant professor in the Department of Orthodontics and Dentofacial Orthopedics.

Currently, Dr. Goodwin is focusing on Pierre Robin sequence (PRS), a congenital condition which involves a series of findings:

- Retrognathia (a posteriorly displaced mandible, with the lower jaw set farther back than the upper jaw)
- Glossoptosis (when the tongue falls back and down into the throat)
- Airway obstruction
- Cleft palate, present in most babies with PRS

“It’s called a sequence because the small mandible is thought to pull back the tongue, cause airway obstruction, and then potentially lead to cleft palate,” she explained. “I’m interested in understanding this condition better and exploring what is wrong with mandibular development. How does the mandible actually get in the way or disrupt palate development?”

She has developed a novel mouse model, using a special genetic tool developed in her lab called Hand2Cre to delete or affect genes specifically in the mandibular mesenchyme, which gives rise to the mandible and the tongue. When she uses the

tool to delete the gene that's most associated with isolated cases of PRS in the mandible only, that leads to disruption in mandibular development and cleft palate in all mouse embryos.

"These data represent the first genetic evidence in vivo showing that the dysmorphic mandible itself can cause cleft palate, in the absence of palate-intrinsic mechanisms," she said. The work is supported by a grant from the American Association of Orthodontists Foundation.

Building upon that research, Dr. Goodwin is now looking into additional factors that may contribute to PRS. Most PRS cases do not involve a genetic diagnosis, so she aims to identify genes that may be involved. She has identified a candidate gene called SIX6.

"Its role in craniofacial development is not understood. We're very interested in investigating this gene and what it does in craniofacial development, mandible development, and whether it could be an underlying cause for PRS in patients," Dr. Goodwin said. Deletions in SIX6 have been previously associated with problematic development of the pituitary gland and eyes.

She is developing a mouse model for the project. In addition, using the University of Pittsburgh Dental Registry and DNA Repository, she has identified 90 patients with small lower jaws or mandibular hypoplasia and six with cleft palate. Using polymerase chain reaction, she will test single nucleotide polymorphisms (SNPs) associated with SIX6 in those samples, then compare them with samples from healthy controls. For this work, she has been named one of five inaugural fellows of the 2024 Bethel Musculoskeletal Research Center and awarded a \$30,000 grant (with co-investigator Mariana Bezamat, DDS, PhD).

"My research is basic, but the ultimate goal is to translate the data. It's laying the foundation to learn more about the genes involved in mandibular development and clefting. The ultimate goal would be to improve genetic diagnosis and develop better therapies," she said.

Currently, treatment for babies with these conditions consists of mandibular distraction osteogenesis in the first few years of life. The surgery involves cutting the jaw, placing an expander, and slowly lengthening the jaw over time. Then, in adolescence or

adulthood, patients have a second jaw surgery to lengthen and advance the mandible further. Someday, she hopes her work will improve genetic diagnosis and lead to a therapeutic target to modulate growth of the jaw.

As part of her role at Pitt, Dr. Goodwin works with many dental students and residents. She teaches them the scientific method so they are better equipped to read and evaluate data and information, which can ultimately help them be better orthodontists.

"Most of our residents are going to go practice orthodontics and not perform research or work in a lab. But their clinical approaches have to be based on evidence or data, which will change throughout their practice," she said. "I hope I can impress upon them how to go to the literature and evaluate the evidence for a new clinical approach or appliance."

Dr. Goodwin completed the combined DDS/PhD program in oral and craniofacial sciences at the University of California, San Francisco (UCSF) School of Dentistry. She then completed her residency at UCSF and was faculty there until she joined Pitt in 2023.

HOW AND WHY DO SOME INDIVIDUALS DEVELOP CRANIOFACIAL ANOMALIES?

Rebecca Green PhD



During facial development, tissues move, change, and fuse to create what is considered a normal face. However, disruptions in this process can create craniofacial anomalies, such as cleft lip and palate. Rebecca Green, PhD, assistant professor and researcher in the School of Dental Medicine, is working to better understand facial and dental development, specifically cell signaling, migration, proliferation, and apoptosis processes that may contribute to anomalies.

Although she isn't a dentist by training, her research into birth defects of the face is highly relevant to dentistry.

"I consider myself to be a birth defects researcher, but I work primarily on birth defects of the face. The same developmental processes that make teeth also basically make faces. They're all interrelated structures,"

said Green, who earned her PhD in reproductive biology and developmental biology from the University of Colorado in Anschutz Medical Campus and completed postdoctoral work in craniofacial biology at the University of Calgary in Canada. "My work examines what makes one individual unique from another individual. What happens during development that makes individuals different from each other? We know that some of these changes happen really early in development, but we don't know how or why."

Dr. Green's research focuses on the early embryonic origins of cleft lip and palate. She works to understand how development shapes variation. She noted that even in genetically identical individuals (i.e., identical twins), when one twin is born with a facial cleft, there is only a 50% chance that the other twin will also have a facial cleft.

To explore these concepts, Dr. Green's lab works in a number of mouse models. They recently published some of their findings in the FASEB Journal, reporting that cell proliferation in maxillary and nasal processes play a role in murine facial morphogenesis.

A current project in Dr. Green's lab is trying to understand how clefting happens in animals where all the animals have the same genome, but only some of them develop a cleft, such as the A/WySn mouse, a lab strain mouse in which about 25% of the mice randomly develop cleft lip and palate. Using this model, her team is looking at the potential impact of nutritional factors in the mother (such as folic acid) on outcomes in the offspring. They are also examining how changes in DNA methylation and changes in gene expression relate to the presence of facial clefting.

In this model, cleft penetrance appears to be linked to methylation differences in a

retrotransposon, genetic elements that can move within a cell's genome by converting their RNA into DNA, a process called reverse transcription. She has found that methylation changes in a retrotransposon inserted near a gene called Wnt9B, correlate with changes in early facial shape during development. These changes also affect Wnt9b expression, which is present around the nasal prominence as it's developing.. They are working to show that changes in this retrotransposon lead to decreased proliferation of the mid-face, preventing the outgrowth of the facial prominences and not allowing them to come together and fuse. "That non-coding RNA seems to somehow interfere with Wnt 9B transcription. That's what we know. What we don't know is what leads to that change in methylation." She has an RO3 grant to explore this line of inquiry.

Ultimately, Dr. Green believes that facial clefting is highly multifactorial. To explore that concept, she is collaborating with the

Microcomputed Tomography (Micro CT) Core in the School of Dental Medicine and the University of Pittsburgh Center for Biological Imaging (CBI). They are using 3D microscopy to better understand how proliferation and signaling may be related in early facial prominence development.

"We're trying to model how the face grows during development and starting to build some computational models in terms of how the different pieces of the face have to grow and align in order to properly fuse the face," she explained. "Maybe we'll start to see some changes in presentation. Maybe we'll start to see some really early embryonic changes, some upstream processes that might be related."

Dr. Green's research is in collaboration with groups at the University of Calgary; University of Saskatchewan; and University of California, San Francisco.

EXPLORING THE MANY WAYS ERM CELLS MAY IMPACT DENTISTRY

Andrew Jheon DDS PhD



Andrew Jheon, PhD, is using new technology to take another look at cells that were first noticed in another century—but were left behind because they could not be adequately studied until now. He believes they could be highly relevant to many areas of dentistry.

“We think that these cells have a lot of clinical relevance to what we do, but we just don’t know what they do specifically. If it is true, it would be of interest to most of dentistry,” said the associate professor in the Department of Orthodontics and Dentofacial Orthopaedics.

Dr. Jheon joined the University of Pittsburgh School of Dental Medicine about a year ago and is setting up a lab here. Among his previous accomplishments, he discovered a novel gene named *AJ18/Znf354c*, which plays a role in bone development, and he found that the genes *Isl1* and *Perp*

are important to tooth development. Now Dr. Jheon is setting his sights on better understanding epithelial cell rests of Malassez (hereafter referred to as ERM cells or ERMs).

“ERMs are cells that I became interested in while I was working on *Isl1*, because they seemed to play a role in mouse incisor development. The mouse incisor isn’t as similar to human teeth as people would like because they continuously renew and erupt, which human teeth obviously do not,” he said. “We realized that it was likely having an effect on the crown-to-root ratio of the tooth, which indicated it may also be playing a role in root development.”

ERMs are present in the periodontal ligament space, but their functions are not clear. It is clear, however, that these cells decrease in number as we age, which has been confirmed in human and rat models. Dr. Jheon also suspects, based on mice and rat

models, that ERM cells are playing a role in the overeruption of teeth. The overeruption of unopposed teeth is commonly seen in the dental clinic, often requiring an orthodontist to intrude the overerupted tooth, adding cost and time and unwanted root resorption. Interestingly, overeruption of teeth seems to slow and decrease with age.

ERMs were first identified in the 1800s and have been studied intermittently since then, largely because scientists didn't understand them and didn't have the tools to explore them.

"A lot of the information we have is from cell culture. Scientists would isolate these cells and grow them in culture, and they found that they can make more of themselves, and they can also differentiate into different lineages, which are the two criteria for stem cells. Whether or not they act that way in vivo, we don't yet know," Dr. Jheon said.

Now, with the ability to examine these cells in three dimensions using various fluorescent

mouse models, novel fluorescence injection and tissue-clearing protocols, and powerful microscopes, Dr. Jheon said, his team can really see all the ERM cells that surround the teeth. They plan to examine the cells' role in everything from overeruption to orthodontic tooth movement, root resorption, ankylosis, and the formation of dental cysts and tumors.

"Revisiting certain science topics may be helpful with new technology," Dr. Jheon said. He hopes that applying these new analysis techniques may lead to better understanding of ERMs and strategies to target them for therapeutic purposes. "Clinicians need to change their mindset about basic research and understand that it is valuable and it is complementary to what we do in the clinic."

Dr. Jheon applied that principle when examining the reasons human skulls may be getting smaller over time.

"It's been generally thought that our skulls have shrunk in the past 100 years or so, just the way we are evolving," he said. He and

his team showed that soft diets are playing a role. He fed a mouse model soft, powdered food for 15 generations to mimic loosely the number of human generations that have passed since the Industrial Revolution, which radically changed the way people eat. He then measured changes in the mice's skull size over time. They saw definitive changes in the skull, a slight vertical lengthening of the cranium and mandibular shortening, which reflects what we have seen in people's skulls over time.

Dr. Jheon received his PhD in biochemistry and his doctor of dental surgery degree from the University of Toronto, then completed his postdoctoral fellowship and orthodontic residency at the University of California, San Francisco (UCSF). Dr. Jheon was a tenured associate professor at UCSF before his move to the University of Pittsburgh in 2023.

THE FOUR-WAY INTERSECTION OF GENETICS, SOCIAL DETERMINANTS OF HEALTH, ORAL HEALTH AND SYSTEMIC DISEASE

Samantha Manna PhD



Samantha Manna, PhD, is a geneticist, but she wants people to know that the saying isn't true—it's not all in your DNA.

"I'm a geneticist. And genetics plays a role in everything, but it certainly isn't everything," said Dr. Manna, who received her PhD in human genetics from the University of Pittsburgh School of Public Health. "I try to bring a public health perspective to genetics. How genetics interacts with our environment is underappreciated. It involves understanding how things such as social determinants of health might be influencing how we see risk mediated by our genetics."

Much of her current work focuses on a variant in the CREBRF gene (a protein-coding gene that influences how the body stores and uses energy and is involved in other basic cell functions) that is specific to Pacific Islanders. Not much is known about the CREBRF gene, so Dr. Manna is seeking

to understand how this variant in CREBRF affects obesity and diabetes in Samoans. The country has a high prevalence of obesity, and generally speaking, higher BMI is a risk factor for developing type 2 diabetes. However, in this population, there's a lower prevalence of individuals who have type 2 diabetes when they carry at least one of these variants, even in those with higher BMI.

Dr. Manna, who has dual appointments in the School of Dental Medicine Department of Oral and Craniofacial Sciences and the Pitt School of Public Health Department of Human Genetics, explains, "There have been evolutionary pressures that have introduced some interesting variants in their genomes that have consequences for health and disease." She aims to characterize the function of the gene, as well as ways that variations in the gene can affect factors such as height, body mass index (BMI), and disease.

Dr. Manna is a member of the Obesity, Lifestyle, and Genetic Adaptations (OLaGA, which is the word for “life” in Samoan) study group. The research group works to better understand the contributors to obesity among Samoans and other Pacific Islanders, focusing on developing culturally relevant interventions to reduce the burden of obesity and obesity-related conditions.

Recently, she has started examining Samoan oral health. Her team has collected self-report data from about 400 mother-child dyads on topics such as how frequently they brush their teeth, how often they visit a dentist, and barriers to seeing a dentist. The researchers plan to compare the data to previous reports in that population and other populations, such as other Pacific Island countries.

Samoa doesn't have an insurance structure like the United States, and there are a limited number of dentists. Therefore, people often delay routine dental care until there is an obvious issue (e.g., pain), then they will go to local hospitals. If they need more intensive

or intensive care, they may travel to New Zealand, similar to when they require more advanced medical care.

“Once we have the preliminary data, we plan to work toward improving knowledge, improving outcomes, and increasing access, which can be challenging for an island population,” she added.

Dr. Manna also is conducting research in the Appalachian population as part of the Center for Oral Health Research in Appalachia. Correlations have been established between caries and periodontal disease and systemic health, and she would like to focus on their relationship with obesity and overweight status.

“Correlations have been made between caries and periodontal disease and systemic health. Things like inflammation, for example, are prevalent both in periodontal disease and in obesity, as well as diabetes. But there's kind of a chicken-egg problem. What causes what? There are a lot of shared pathways, and of course, lifestyle factors are involved. If

you are consuming more sugary beverages and processed foods, you're going to have higher risk for developing caries, and it's also more likely that you're going to be overweight or obese,” she said. “I am trying to disentangle that in this population with a special approach called Mendelian randomization, which is supposed to help us get more causation rather than just a correlation.”

Some may question how research in these very specific populations is translatable or generalizable, but she explains: “Understanding what genes do is broadly applicable to everybody. And the team that I work with is also de-emphasizing the necessity for generalizability. Populations are worthy of study regardless of whether those findings apply to other groups, particularly when we're talking about underrepresented populations. The vast majority of genetic and genomic studies have been based on people of European ancestry. It's getting better, but we still have a lot of space to go.”

RESEARCH TO PREVENT AND TREAT PERI-IMPLANTITIS

Andrea Ravidà DDS MS PhD



Millions of people in the United States already have dental implants, and approximately half-a-million more receive them annually. Unfortunately, peri-implantitis, an infectious and inflammatory condition that affects the implant and surrounding tissue, develops in about 20% to 30% of cases. This condition arises when bacterial accumulation leads to inflammation in the soft tissue around the dental implant, ultimately resulting in tissue breakdown and bone loss.

“Many people believe that implants last forever, but they can develop complications such as peri-implantitis, requiring extensive treatment and even removal,” said Andrea Ravidà, DDS, MS, PhD, director of the Periodontics Department at the University of Pittsburgh School of Dental Medicine. “This can be both costly and emotionally challenging for patients who face the risk of losing their implants. Our research is focused

on determining the most effective ways to treat peri-implantitis and save implants.”

Dr. Ravidà and his team are conducting a series of clinical trials to study different surgical techniques and other clinical procedures aimed at decontaminating infected implants. One current study is enrolling patients with implants that cannot be saved due to peri-implantitis. The research compares two techniques: the conventional method of deep cleaning with curettes versus air-polishing using erythritol powder.

“Typically, we use curettes to scale infected implants, much like we do with teeth. However, the design of implants—particularly the threads and valleys—makes this technique less effective,” explains Dr. Ravidà. The air-polishing method, which uses erythritol powder, might be more efficient at removing plaque and biofilm both above and below the gumline.

After undergoing one of these treatments, the implants are removed and examined in the lab. Researchers assess the remaining bacterial load, bacterial characteristics, corrosion, and any titanium particles released during cleaning. They then will attempt to grow osteoblasts on the implant surface to determine whether bone regeneration is possible.

Another focus of Dr. Ravidà's research is the accurate diagnosis of peri-implant mucositis, a precursor to peri-implantitis. Peri-implant mucositis often is diagnosed with a probe, where bleeding during probing is considered diagnostic. "However, there are different causes of bleeding," Dr. Ravidà said. "Some patients may bleed due to trauma caused by the probe rather than inflammation, leading to potential misdiagnosis."

To address this, Dr. Ravidà's team is analyzing small tissue biopsies using single-cell analysis, an advanced technique that characterizes individual cells and provides insights into the underlying genetic and molecular mechanisms. This project is supported by the American Academy of Osseointegration (AAO).

Finally, Dr. Ravidà is investigating the effectiveness of implantoplasty, a procedure that smooths the surface of an implant by removing its threads. This approach is widely used and believed to make the implant surface easier to clean and less hospitable to bacteria.

A study supported by the International Team for Implantology (ITI) is currently enrolling patients who have undergone treatment with or without implantoplasty. To simulate

poor oral hygiene, participants are asked to refrain from brushing for three weeks, during which microbiological and immunological data are collected. After this period, the participants' teeth and implants are cleaned, and researchers track the resolution of inflammation over the next three weeks.

"The University of Pittsburgh School of Dental Medicine has become a referral center for patients with peri-implantitis from across the state and beyond," Dr. Ravidà said. "Not only are we building a strong clinical program, but we are also providing top-quality training for our residents, equipping them to treat patients and advance the science of peri-implantitis treatment."

Pitt Dental Medicine Student Research Group

MESSAGE FROM THE SRG PRESIDENT

Welcome to the 2024 School of Dental Medicine Research Symposium. The past year has been a truly remarkable one for the student members of the Pitt Student Research Group (SRG) chapter. Just this year, Pitt Dental Medicine SRG members won University-wide competitions, presented research at international conferences, and received the “Outstanding Local Chapter Award” from the National Student Research Group of the American Association of Dental, Oral, and Craniofacial Research. We are immensely proud of these achievements and are excited to see what accomplishments are in our future.

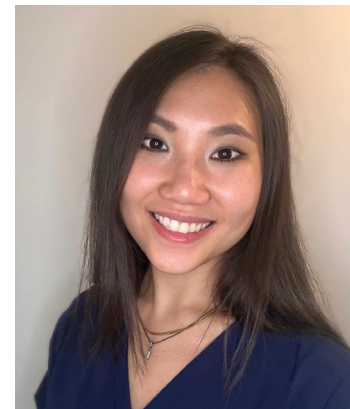
Since the revival of our SRG chapter, our digital newsletters have been a predominantly student-driven project to 1) showcase the admirable work of student researchers to the larger Pitt Dental Medicine community and 2) create a lasting platform to highlight our chapter’s educational seminars and

workshops. As our presence within the school grew and gathered the warm support of more students, faculty, and administrators this year, we looked to expand the production and distribution of our newsletter into our first ever printed magazine!

We thank all the student authors for their contributions and want to especially recognize the SRG Newsletter Committee members: Urjasvi Patel (DMD ‘26) editor in chief; Emma Fetchko (DMD ‘27) co-vice president; and Victoria Marco (DMD ‘27) associate editor, for their work in organizing and implementing our creative vision. We would also like to thank Dr. Fatima Syed-Picard, Dr. Charles Sfeir, and Dr. Marnie Oakley for allowing us to broaden the scope of our chapter’s involvement at Pitt Dental Medicine.



Kevin Lu (DMD '26)
SRG President



Leah Zeng (DMD '26)
Immediate Past President

PITT DENTAL MEDICINE STUDENT RESEARCH GROUP RECEIVES 2024 OUTSTANDING LOCAL CHAPTER AWARD

In March 2024, Pitt Dental Medicine student researchers traveled to New Orleans to attend the 2024 General Session & Exhibit of the International Association for Dental, Oral and Craniofacial Research; American Association for Dental, Oral and Craniofacial Research; and Canadian Association for Dental Research (IADR/AADOCR/CADR).

This annual conference is the premier meeting place for scientists around the world pursuing dental, oral, and craniofacial research, and the hub for information sharing on the newest developments in the world of dentistry. Pitt Dental Medicine student researchers were proud of their research findings and excited to network with distinguished scientists. And this year, Students knew that the Pitt Dental Medicine SRG chapter was selected to receive the 2024 Outstanding Local Chapter Award from the National Student Research Group (NSRG) of the AADOCR. This award recognizes a SRG chapter from nominees across the country that has excelled in promoting awareness of dental research and encouraging student participation in

research at their school, which the chapter strives to do through community building and interprofessional collaboration. At the awards reception, SRG President, Kevin Lu, Immediate Past President, Leah Zeng, and Graduate Student Representative, Yejin Ki (DMD/PhD '26), accepted the award certificate in person and shared presentations about their chapter's innovative initiatives and engaging events.

"Rebuilding our Pitt Dental Medicine SRG chapter has been a process of growth—a process that allows us to uniquely adapt to what we think works best for all dental and graduate students at our school" said Kevin Lu.

Many dental students are apprehensive about how to get started in the field of dental research. To assist those students and decrease barriers to research, the Pitt Dental Medicine SRG chapter has organized various events to build community, foster opportunities for peer-to-peer learning, and allow students to network with accomplished



faculty. Additionally, with the help of graduate students in the Department of Oral and Craniofacial Sciences (OCS) and research faculty, we created an online database of available student researcher positions in faculty labs to encourage more student research involvement. In the spirit of collaboration, we also want to emphasize the strong partnership between our predoctoral and graduate student members. Our chapter's officer roster uniquely consists of motivated

leaders from both programs, allowing us to represent the voice of all student researchers and curate events tailored to our members' diverse interests.

Receiving the Outstanding Local Chapter Award at the 2024 IADR/AADOCR/CADR conference was a honor that we happily share with the other 2023-24 SRG officers: Brian Lee (DMD '26), Taylor Dermond (DMD '26), Mahdiah Alipour (PhD candidate), Yejin Cho (DMD/PhD '26), Emma Fetchko, Urjasvi Patel (DMD '26), Thomas Fekeru (DMD '26), and Emma Nordin (DMD '27). Their efforts



behind the scenes truly allow our chapter to flourish and thrive!

Additionally, students want to thank NSRG for selecting their chapter for the award and giving them a platform to share their story.

Students also thank Dr. Syed-Picard for being their trusted advisor, Dr. Sfeir for inviting student feedback and collaboration on school-wide events and competitions, all the research faculty who have supported SRG activities, and Dr. Oakley for steering Pitt Dental Medicine toward continued excellence.

Reflections on this award bring a sense of great pride and appreciation for what Pitt Dental Medicine's SRG chapter has achieved and continues to offer to their members. It is a privilege to serve the greater research community in this capacity.

REFLECTIONS FROM STUDENT RESEARCHERS ABOUT IADR/AADOOCR 2024

Reflecting on the excitement of attending this large-scale conference, four student researchers describe their unique experiences.



Emma Fetchko
(DMD '27)

"Having the opportunity to attend an international

conference during my first year of dental school was incredible. I worked hard on the research I presented and found it valuable to talk to professionals from around the world about my research interests. I also had the chance to learn about new research that is happening. It was an incredible conference and an unforgettable experience that will continue to be valuable in my career."



Thomas Fekeru
(DMD '26)

"The IADR/AADOOCR conference served as a great opportunity

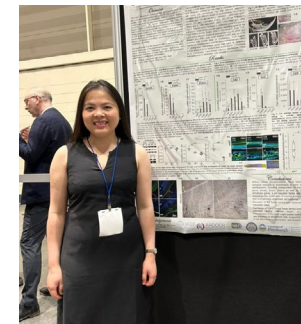
for me to develop my skills. Presenting at the

conference allowed me not only to improve my ability to communicate my findings and answer questions, but also to gain insight into different projects being completed. The opportunity to speak with and learn from experts in various fields was a personal highlight for me, as it showed just how much there is to learn while continuing a career in research."



Dylan Baxter
(PhD candidate)

"Participating in the IADR/AADOOCR meeting this year was a fantastic experience. It gave me the chance to present my ongoing research and receive input from students and experts from all over the world. It was incredibly interesting to hear about all of the research going on from other institutions and make connections that I otherwise would never have been able to make."

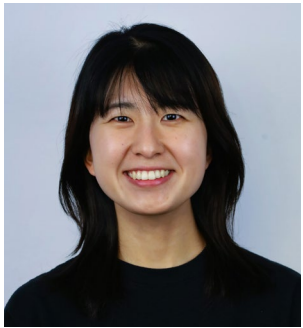


Ai Thu Bui
(PhD candidate)

"I joined IADR/AADOOCR during my first year in the US and have continued to participate each year. It brings me great joy to connect with my research network and friends and to stay updated on the latest in dental research. I enjoy the atmosphere of Pitt Dental Medicine's research centers, where everyone discusses their preparations for the next IADR/AADOOCR conference, plans trips together, and shares wonderful moments. My favorite session is the NIDCR/NIH Trainee Research Poster Presentations, where I met many open-minded young students and investigators and had the opportunity to interact with them."

2024 STUDENT AWARDS AND RECOGNITIONS

Pitt Dental Medicine DMD/PhD Candidate Receives NIH Ruth L. Kirschstein National Research Service Award Fellowship



Yejin Cho, a DMD/PhD student in the University of Pittsburgh School of Dental Medicine Department of Oral and Craniofacial Sciences, has received the NIH

Ruth L. Kirschstein National Research Service Award Individual Fellowship. This award will enable an individualized, mentored research training with a current faculty member while conducting dissertation-related research in a scientific health-related field. This is the first time that a DMD/PhD student at Pitt Dental Medicine has received this award.

"I am so thankful to receive the F30 grant award from the NIH/NIDCR and believe this award will be a significant stepping stone in my career. It will help me pay for my education, continue my dissertation research,

and attend the IADR/AADOCR annual conference.

This award will support me in acquiring valuable research training and mentorship to complete my PhD and help me solidify my career journey in dental, oral, and craniofacial research and guide me to become an independent clinician-scientist leading a research team. I am very grateful for all the support and resources I have received at the University of Pittsburgh School of Dental Medicine." said Cho.

Yejin Cho also received an Outstanding Regional Representative Award from the NSRG for serving as a vocal liaison between local SRG chapters and the NSRG .

Cho adds, "The Ohio Valley Regional Representative position provided an invaluable networking platform to foster stronger connections between dental and graduate students at different dental schools. I am thankful to play a role in revitalizing the student research initiatives and will keep exploring ways to contribute to the NSRG board."

Nadine Robert, 3MT Competition People's Choice Prize



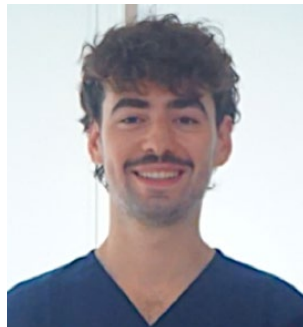
Congratulations **Nadine Robert**, PhD candidate in the Department of Oral and Craniofacial Sciences, on winning the People's Choice Prize at the 2024 Pitt

Three Minute Thesis (3MT) Competition after receiving the most audience votes for favorite presentation. This University-wide competition brought together nine Pitt PhD students from various disciplines who are conducting ground-breaking research to test their ability to effectively explain their research to a non-specialist audience in only three minutes using only one visual.

For the competition, Robert presented her dissertation project titled, "How do cells recognize and respond to phosphate?". Her research in Pitt Dental Medicine associate professor Dr. Dobrawa Napierala's laboratory aims to understand causes that

lead to impaired bone mineralization, particularly in children with soft bones. Robert and the research team found that bones' forming cells need to possess the parathyroid hormone 1 receptor (Pth1r) to recognize and respond to phosphate ions for proper mineralization.

Additionally, Robert was a finalist for the prestigious AADOCR Hatton Competition: Senior Category.



Mat Lipkin (DMD '25) was honored with the CTOR Award for Student Excellence in Orthodontics Research Finalist. Selected as top 10 of 131 abstracts

submitted to the Orthodontic Research Group of the International Association of Dental Research.

Alison Buckwalter (DMD '26) was chosen as the Pitt Dental Medicine representative for the Student Competition for Advancing Dental Research and its Application.

Pitt Dental Medicine PhD Candidate Receives NIH F31 Grant



Brent Vasquez, a PhD student in the University of Pittsburgh School of Dental Medicine Department of Oral and Craniofacial Sciences, has

received a prestigious National Institutes of Health (NIH) National Research Service Award (NRSA). This award supports a mentored research experience for predoctoral researchers (F31) for up to 5 years. Notably, this is the first time that a student at Pitt Dental Medicine has received this award.

"I am truly honored to have been awarded the NRSA grant from NIH/NIDCR—this is a significant milestone in my research career. The grant not only offers financial support that will allow full dedication to my dissertation project, but also represents recognition from the scientific community. This achievement allows me to engage deeply in my research

interests and reinforces my commitment to a career in oral and craniofacial sciences. I am profoundly grateful for this opportunity and for the support that I have received from my mentors and colleagues throughout my experience at the University of Pittsburgh School of Dental Medicine. I am thrilled to see where this journey will take me and discoveries that await." said Vasquez.

STUDENT PUBLICATIONS

Dylan Baxter (PhD candidate)

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Chelsea Carver (DMD '26)

Bezamat M, Carver CE, Vieira AR. Family-based GWAS for dental class I malocclusion and clefts. *BMC Oral Health*. June 2024;24(1):665. doi:10.1186/s12903-024-04444-x

Antonio Cardoso (DMD '26)

El Sergani A, Anderton J, Brandebura S, Cardoso A, Carver C, Gabrael Y, Khairnar S, Padilla C, Butali, A, Adeyemo W, Valencia-Ramirez, C, Restrepo Muneton, C, Moreno L, Buxo C, Long R, Marazita, M, Weinberg, S. Data-driven modular analysis of palate shape identifies localized patterns associated with elevated orofacial cleft risk. *Cleft Palate Craniofac J*. [under review]

Yejin Cho (DMD/PhD '26)

Shehabeldin M, Gao J, Cho Y, Chong R, Tabib T, Li L, Smardz M, Gaffen S, Diaz P, Lafyatis R, Little S, Sfeir C. Therapeutic

Delivery of CCL2 Modulates Immune Response and Restores Host-microbe Homeostasis. *Proc Natl Acad Sci USA*. [under review]

Youssef Gabrael (DMD '26)

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Deshawna Glenn (DMD '27)

Cantalupo P, Diacou A, Park S, Soman V, Chen J, Glenn D, Chandran U, Clark D. Single-cell Transcriptional Analysis of the Cellular Immune Response in the Oral Mucosa of Mice. Preprint. bioRxiv. 2023;2023.10.18.562816. Published 2023 Oct 20. doi:10.1101/2023.10.18.562816

Shivam Khairnar (DMD '26)

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of palate shape identifies localized patterns associated with elevated orofacial cleft risk. *Cleft Palate Craniofac J*. [under review]

Emyli Peralta (DMD '25)

Peralta E, Tallman T, Scala C, Scala B, Dahl Z, Weyant R, Shaffer J, Foxman B, McNeil D, Marazita M, Burgette JM. Maternal Perceptions of Assisting Pre-school Aged Children with Toothbrushing. *J Am Dent Assoc*. July 2024;155(7):597-604. doi:10.1016/j.adaj.2024.04.005

Burgette JM, Peralta E, Chew C, Watson KI, D'Alesio AM, Rosen D. Infant Oral Health Education Curriculum for Medical, Nursing, and Social Work Trainees. *J Interprof Educ Pract*. Dec 2023;33:100682. doi:10.1016/j.xjep.2023.100682

Anjali Ravi (DMD '26)

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Mahboube Hasheminasab

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ABSTRACTS AND PRESENTATIONS

Dylan Baxter

Dylan J. Baxter, Mariana Bezamat, et al. Genetic Association of Atherosclerotic Cardiovascular Disease and Dental Diseases. Poster Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Antonio Cardoso

Cardoso A, Anderton J, Brandebura S, Cardoso A, Carver C, Gabrielael Y, Khairnar S, Shaffer JR, Marazita ML, Weinberg SM, El Sergani AM. Characterizing Sexual Dimorphism in the Human Palate using Statistical Shape Analysis. Interactive Talk Presentation. 2024 AADOCR/IADR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Yejin Cho

Cho Y, Gao J, Lacin N, Kobyra J, Little S, Sfeir C. An Immunomodulatory Strategy for Preventing Peri-implantitis. University of Pennsylvania School of Dental Medicine CiPD Symposium, Philadelphia, PA. May 30, 2024.

Cho Y, Gao J, Badzai A, Shterengarts E, Lacin N, Kobyra J, Little S, Sfeir C. A Local Immunomodulatory Strategy for Preventing Peri-implantitis. Interactive Talk Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Cho Y, Gao J, Badzai A, Shterengarts E, Lacin N, Kobyra J, Little S, Sfeir C. A Local Immunomodulatory Strategy for Preventing Peri-implantitis. NIH NIDCR Trainee Poster

Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Thomas Fekeru (DMD '26)

Fekeru T, Rothermund K, Syed-Picard FN. Temporal Regulation of Innervation by Differentiating Dental Stem Cells. Poster Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Emma Fetchko (DMD '27)

Fetchko E, Sangalli L, Letra A. Sex-based differences in oral diseases and conditions. Poster Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Youssef Gabrielael

Gabraiel Y, Anderton J, Brandebura S, Cardoso A, Carver C, Khairnar S, Shaffer JR, Marazita ML, Weinberg SM, El Sergani AM. Statistical Shape Analysis identifies palatal endophenotypes in unaffected parents of children affected with nonsyndromic orofacial clefting. Interactive Talk Presentation. 2024 AADOCR/IADR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Deshawna Glenn

Cantalupo P, Diacou A, Park S, Soman V, Chen J, Glenn D, Chandran U, Clark D. Characterization of Immunoregulatory Macrophage Subpopulations in the Oral Mucosa. Poster Presentation. 2024 AADOCR/IADR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Maya Humeda (DMD '25)

Humeda, Maya. Bridging the Gap: Enhancing Oral Health Literacy and Empowering Patients.

Presented at Medical Education Day, University of Pittsburgh School of Medicine. September 2023.

ADEA Diversity, Equity, Inclusion and Belonging Workshop, Pittsburgh, PA. October 2023.

ADEA Annual Session & Exhibition, New Orleans, LA. March 2024.

Health Disparities & Social Justice Poster Presentation, University of Pittsburgh Health Sciences. March 2024.

Shivam Khairnar (DMD '26)

Khairnar S, Anderton J, Brandebura S,

Cardoso A, Carver C, Gabrael Y, Shaffer JR, Marazita ML, Weinberg SM, El Sergani AM. Exploring Ancestral Differences in the Human Palate using Geometric Morphometric Analysis. Interactive Talk Presentation. 2024 AADOCR/IADR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Nursima Lacin (PhD candidate)

Lacin N, Gao J, Cho Y, Kobyra J, Sfeir C. Local Mg²⁺ Delivery for the Immunomodulatory Treatment of Periodontal Disease. Poster Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Cho Y, Gao J, Shterengarts E, Lacin N, Kobyra J, Little S, Sfeir C. A Local Immunomodulatory Strategy for Preventing Peri-implantitis. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Lacin N, Gao J, Cho Y, Kobyra J, Sfeir C. Local Sustained Mg²⁺ Delivery for the Immunomodulatory Treatment of Periodontitis. Poster Presentation. Research Day Symposium and the Pittsburgh Craniofacial Sciences Training Program Retreat, University of

Pittsburgh School Dental Medicine, Pittsburgh, PA. September 11, 2023.

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Mat Lipkin

Lipkin M, Letra A. Individual/familial cancer history in dental patients with skeletal and/or dental malocclusion. Poster Presentation. 2024 IADR/AADOCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

Nadine Robert

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Robert N, Chaudhary S, Socorro M, Khalid S, Roberts C, Taboas J, Napierala D. Phosphate Signaling Is Mediated via

Parathyroid Hormone Receptor 1-PLC-PKC Pathway in Committed Odontogenic Cells.

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ASBMR 2023. Vancouver, Canada. October 13-16, 2023.

Cutting-edge Research from Young Investigators, 2023 ASBMR-RBDA Pre-meeting Symposium on Rare Bone Diseases: Patients, Clinicians, and Scientists Working Together to Improve Lives. Vancouver, Canada. October 12, 2023

Pittsburgh Craniofacial Sciences Training Program Retreat 2023. Pittsburgh, PA. September 14, 2023.

Robert N, Socorro M, Keskinidis P, Hoskere P, Roberts C, Cho Y, Napierala D. Reduced Alveolar Bone Loss in a Trps1-deficient periodontitis model. Penn Perio Conference 2023. University of Pennsylvania, Philadelphia, PA.

Brent Vasquez

Vasquez B, Bui AT, Bhogadi L, Margolis HC, Beniash E. Investigating the potential role of AMELX and ACP4 interactions within

the enamel-matrix complex of ameloblasts. Poster Presentation. 2024 IADR/AADOCCR/CADR General Session & Exhibition in New Orleans, LA. March 13-16, 2024.

COMPETITIONS

Nursima Lacin

Balint Orban Memorial Competition Finalist at the American Academy of Periodontology's 2024 Annual Meeting in San Diego

2023 Pitt Dental Medicine Research Symposium, Travel Award to represent Pitt Dental Medicine at the 29th Hinman Student Research Symposium Competition

AWARDS AND HONORS

Yejin Cho

2023 Pittsburgh Craniofacial Sciences Training Program Predoctoral Research Award

2023 NIH T90 Training Grant Trainee

2023 AADOCCR National Student Research Group Outstanding Regional Representative Award

Deshawna Glenn (DMD '27)

2024 AADOCCR Bloc Travel Grant

Nadine Robert

University of Pittsburgh, K. Leroy Irvis Fellowship, 2023-2024

Southern Regional Education Board Doctoral Scholars Program, Dissertation Fellowship, 2023-2024

University of Pittsburgh, 3MT Competition, People's Choice Award, April 1st, 2024

University of Pittsburgh School of Dental Medicine, 3MT Competition, winner, March 20, 2024

AADOCCR Student Research Day Travel Grant Award, AADOCCR, March 2024

Finalist at the AADOCCR Hatton Competition, Senior category, March 11, 2024

University of Pittsburgh, Graduate and Professional Student Government travel grant, November, 2023

Brent Vasquez

University of Pittsburgh, K. Leroy Irvis Fellowship, 2023-2024

GRANTS

Yejin Cho

F30 Grant from the National Institutes of Health for her project titled, "Local Delivery of CCL2 to Reverse Peri-implant Bone Loss in Murine Peri-implantitis"

Brent Vasquez

Ruth L. Kirschstein Predoctoral Individual National Research Service Award (F31 Grant) from the National Institutes of Health for his project titled, "Investigating the potential role of AMELX and ACP4 interactions within the enamel-matrix complex of ameloblasts"



