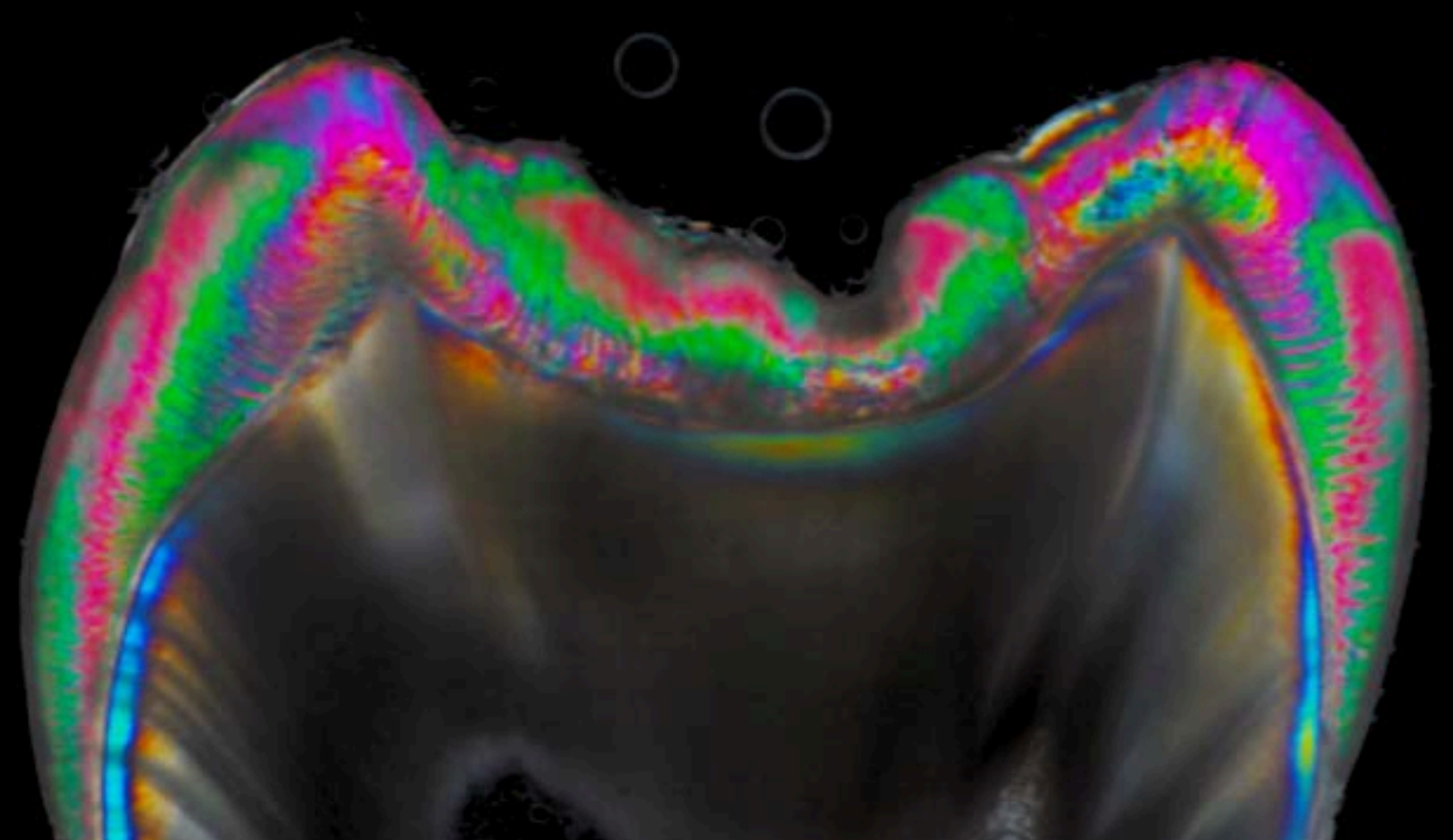
UCLA School of Dentistry

THE EXPLORER

Journal of Dental Student and Faculty Research

2024 Spring Edition



THE EXPLORER TEAM

Anthony (Tony) Nguyen, Editor-in-Chief, Class of 2025

Tony Nguyen grew up in Yucaipa, CA and attended UCLA in undergrad. Go Bruins! In his free time, Tony enjoys cycling and exploring the diverse restaurants around Los Angeles. His hope for the future is to greatly impact his community through dentistry.

Soo Yeon (Jessica) Kim, Editor-in-Chief, Class of 2026

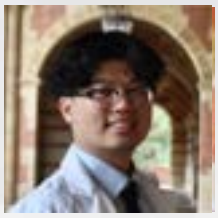
Jessica grew up in Glendale, CA, and received a Bachelor's and Master's degree at UCLA. Jessica enjoys going to the beach, listening to music, and spending time with her family and friends. As a dental student at UCLA, she is excited to serve the people within her community and participate in bone biology research.

Kevin Tong, Contributing Editor, Class of 2026

Kevin Tong was born and raised in Cupertino, CA and attended undergrad at both UC Santa Barbara and UCLA. In his free time, Kevin enjoys weightlifting, playing basketball, volleyball and running. In the future, Kevin hopes to serve his community through dentistry and empower patients to better their oral health.

Nathan Yoshida, Contributing Editor, Class of 2026

Nathan Yoshida was born and raised in Hilo, Hawaii. When he's not catching waves or dominating the pickleball court, you'll find him cheering on the Dodgers. A dedicated dental student by day, Nathan also enjoys giving back through dental service events, making smiles brighter wherever he goes. Calm, caring, and community-driven, Nathan embodies the aloha spirit in everything he does.



Jason Ly-Lee, Contributing Editor, Class of 2025

Jason is from San Diego and is an alumni from UCSD. Jason is a big foodie and loves to run. Next time you see Jason ask him his thoughts on a restaurant you just tried or catch him (if you can) on the streets of Los Angeles on his next run!

Jennifer Gutierrez, Contributing Editor, Class of 2025

Growing up on an Arizona farm, Jen found more than just sunshine—She found love in high school, where she met her amazing husband. Outdoor adventures have always been her thing, and lately, she can't get enough of pickleball!

Sharon Kim, Layout Designer, Class of 2027

Sharon was born in Kansas and raised in South Korea. She attended UCLA for her undergrad and for her Master's program. In her free time, she enjoys to knit, sow teddy bears, and play Nintendo Switch games. Sharon wants to give back to the community through health fair events and dental mission trips.

Amira Mahomed, Layout Designer, Class of 2027

Amira Mahomed was born and raised in Santa Monica, CA. For undergrad, she attended Loyola Marymount University where she studied Health Science and Business. As a dental student, Amira is passionate about mentoring and uplifting pre-dental students. Outside of school, Amira enjoys taking long walks, going to yoga classes, and spending time with her friends and family.

A LETTER FROM THE EDITORS

Dear Readers,

It is with great pleasure and excitement that we welcome you to the 14th edition of The Explorer Journal of Dental Student and Faculty Research. As editors, it is our privilege to present to you a diverse array of scholarly works that showcase the breadth and depth of research conducted at the UCLA School of Dentistry. Our esteemed faculty members are at the forefront of innovation and discovery, tirelessly pushing the boundaries of knowledge in their respective fields. Their commitment to excellence is reflected in the high quality of research featured in this journal, demonstrating their dedication to advancing oral health.

This year's journal would not have been possible without the diligent efforts of our dedicated team of editors, writers, and designers. We would like to thank each and every one of them for their hard work in ensuring the quality and integrity of this year's journal. We would like to extend our deepest gratitude to our faculty advisor, Dr. Yvonne Hernandez-Kapila whose dedication behind the scenes has been instrumental in bringing this publication to fruition, and to Dean Paul Krebsbach, for his unending support towards the research programs at UCLA School of Dentistry.

As you read the following pages, we hope you will be inspired by the innovative research showcased in this journal. We hope it serves as a testament to the remarkable contributions made by the UCLA School of Dentistry community to the advancement of oral health research and clinical practice.

Sincerely,

Anthony Nguyen
Soo Yeon Kim
The Explorer Editors-in-Chief

An Interview With Dean Krebsbach

Anthony Nguyen

Research is the backbone of progress, driving humanity to understand, improve, and innovate. This sentiment resonates deeply with Dr. Paul H. Krebsbach, Dean of the UCLA School of Dentistry, whose passion for research has not only shaped his career but also defines his vision for the future of dentistry. When asked about the importance of research, Dean Krebsbach emphasizes its role in advancing various fields, from engineering to biology. He notes that without research, we would lack the advancements that define modern life. For instance, engineers discover new polymers that improve tire technology, benefiting countless cars. In biology, research leads to cures for human diseases, highlighting the profound impact of research on society. These developments lead us to thrive in understanding, to continue in curiosity, and to seek to make life better and more interesting.

Reflecting on his personal journey, Dean Krebsbach credits research for his position as Dean. Initially torn between pursuing a career in science or art, he chose dentistry as a way to merge both passions. Although a strong hunger for science created doubts within dentistry, he persisted, eventually founding the first student research group in Minnesota. His subsequent Ph.D. at Minnesota and post-doctoral work at NIH further solidified his commitment to research, leading him to his current role.

When asked if every student should engage in research, Dr. Krebsbach advocates for nurturing curiosity, citing research as a powerful way to achieve this. While not every student may conduct hands-on research, understanding its importance is crucial. Research underpins technological advancements like prime and bond materials, which revolutionize dentistry. Dr. Krebsbach believes that appreciating the effort behind such innovations is essential, as it enriches our understanding and appreciation of our professions.

Looking ahead, Dean Krebsbach envisions UCLA as a leader in dental research. He emphasizes that there are no minor leagues in science; every field contributes to the greater body of knowledge. UCLA's commitment to research and discovery, he believes, is integral to its identity as a top dental school. By training not only great clinicians but also leaders in advancing knowledge, UCLA embodies excellence in dental education and research.

In conclusion, Dean Krebsbach’s insights underscore the transformative power of research in dentistry. As students and practitioners, embracing research not only enriches our understanding but also propels us towards a future of innovation and discovery.

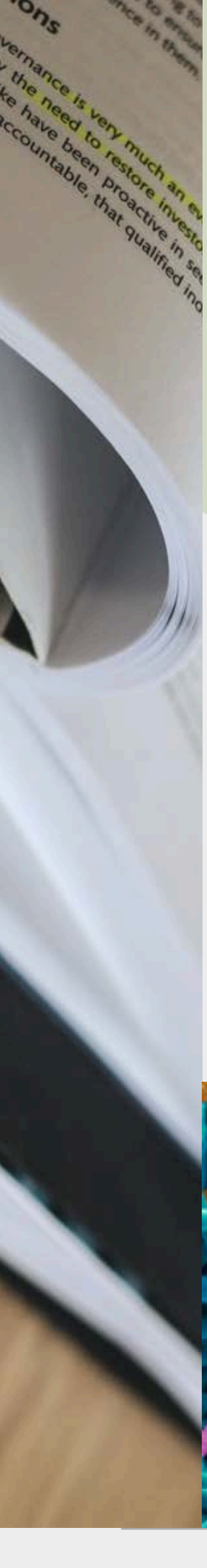
An Interview With Dr. Yvonne Hernandez-Kapila

Anthony Ngyuyen

I had the privilege of sitting down with Dr. Yvonne Hernandez-Kapila, a distinguished professor and the Associate Dean of Research at UCLA School of Dentistry, to discuss the groundbreaking research being conducted in her lab and her vision for the future of dental research at UCLA.

Dr. Yvonne Hernandez-Kapila's lab primarily focuses on the connection between oral and systemic health, with a specific emphasis on periodontal disease. She explained that periodontal disease serves as a valuable model for studying this connection because it is associated with several systemic diseases. Her research has revealed a bidirectional or multi-modal connection between systemic health and oral health, affecting the microbiome at various sites, including the gut, liver, and brain.

One of the key highlights of Dr. Yvonne Hernandez-Kapila's research is the study of nisin, an antimicrobial/probiotic molecule, which has shown promising results in shifting the microbiome from a dysbiosis state to a healthy state in various organs. Her studies with nisin have led to a paradigm shift in the treatment of oral-systemic diseases, demonstrating that probiotic molecules can be used to improve health by shifting the host microbiome and immune response. Currently, the lab is conducting a clinical trial in collaboration with the National Cancer Institute (NCI) to examine the impact of nisin on cancer survivorship and periodontal status in oral cancer patients.

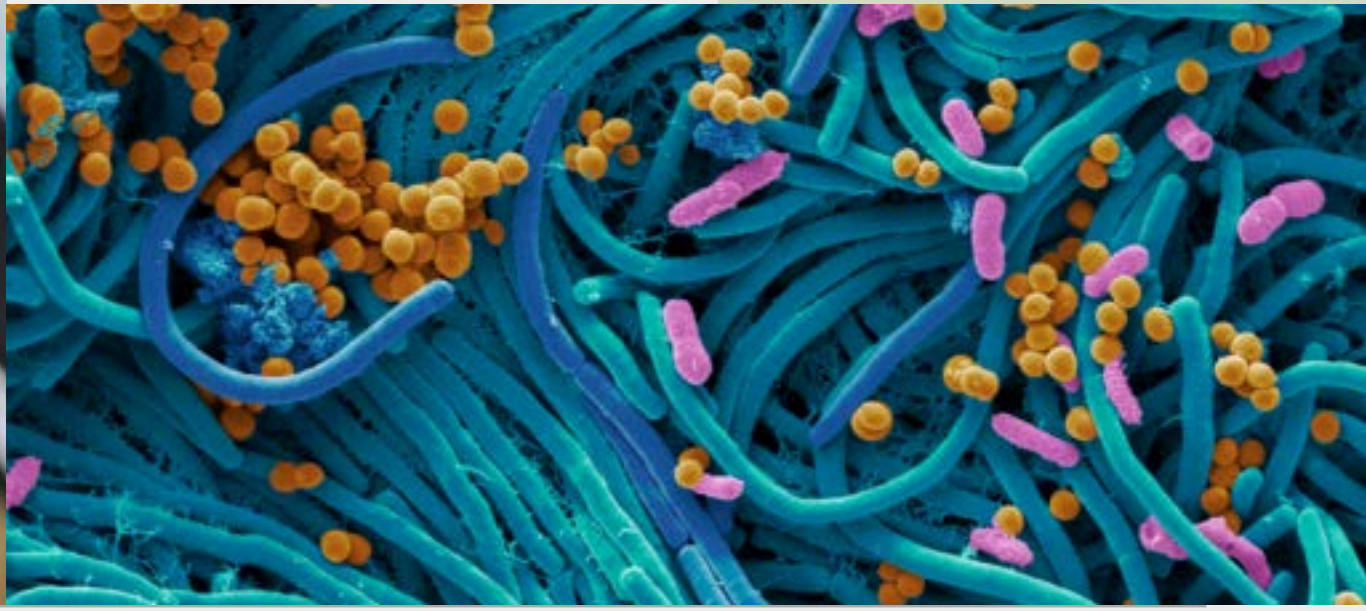


As the Associate Dean of Research, Dr. Yvonne Hernandez-Kapila sees her role as promoting and supporting the research community at UCLA School of Dentistry. She provides resources and support for students at all levels, encouraging their involvement in research through various programs and initiatives. One of the key programs she has spearheaded is the Dental Research Fellowship Program (DRFP), which aims to foster a commitment to research among students from the outset of their academic journey.

Dr. Yvonne Hernandez-Kapila hopes to leave a lasting legacy at UCLA by fostering a culture of research among students and junior faculty members. She aims to provide resources and support for students interested in research and to help junior faculty members secure grant funding and publish their work. By doing so, she hopes to position UCLA School of Dentistry at the forefront of oral, dental, and craniofacial research.

Dr. Yvonne Hernandez-Kapila encourages students interested in research to give it a try, as one may never know what one may discover. She advises seeking opportunities to engage in research and to forge connections, as research can lead to unexpected and rewarding experiences. She shares her own journey into research, starting as a work-study student, as an example of how research can open up new possibilities and pathways in one's career.

In conclusion, my interview with Dr. Yvonne Hernandez-Kapila offered a fascinating glimpse into the world of oral health research and the innovative work being done at UCLA School of Dentistry. Her passion for research and commitment to fostering a culture of research at UCLA are truly inspiring, and it is clear that her work will leave a lasting impact on the field of dental research and at the UCLA School of Dentistry.



Bringing Little Teeth to Big Science

DR. SHANE WHITE

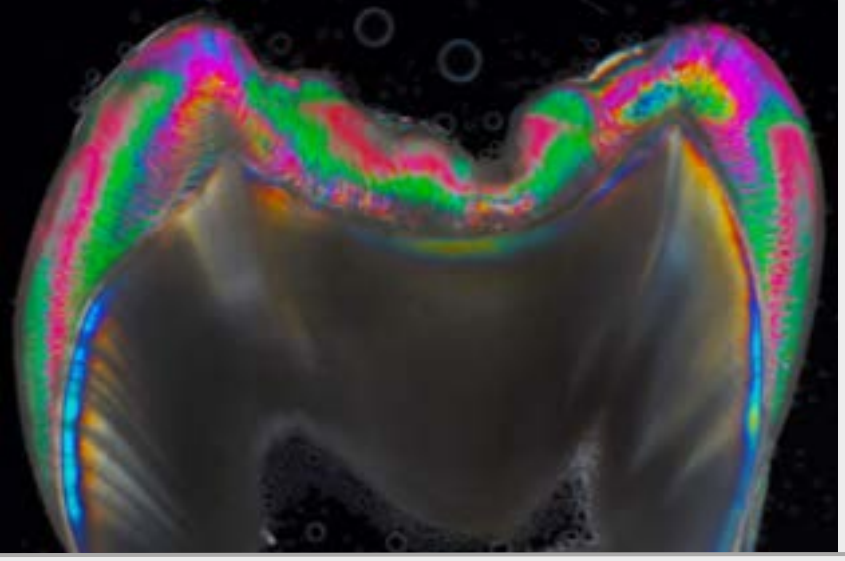
Soo Yeon Kim

It is rare to come across a dentist with expertise in multiple dental specialties, and Dr. White, a professor who has specialized in both prosthodontics and endodontics. In 1988, Dr. White moved from Dublin, Ireland to Los Angeles, California to pursue a Prosthodontics residency and a Master of Science in Oral Biology at UCLA School of Dentistry. When asked about his journey at UCLA, Dr. White replied, “In the 36 years since I came here, I have risen up, about 1 foot per year, from the A-Level Grad Pros Lab to my second-floor research lab,” he jokes. “I pursued prosthodontics because it requires being quite detail-oriented and creative, while endodontics brings immediate gratification to both the patient and me.”

Dr. White was inspired to pursue research by his mother, who was a self-described “old fashioned biologist.” She was full of wonder of the natural world, and encouraged Dr. White to follow his passions from a young age and take risks in his career. Now, Dr. White has not only served as a Professor of the UCLA Endodontics Section, but also served as Chair of the Academic Senate of both the UCLA campus and of the entire University of California, as well as being Faculty Representative to the UC Board of Regents.

Dr. White has multiple projects in his lab, pursuing research interests in dental biological materials, particularly genetic-structural relationships in enamel, and patient-centered dental outcomes. Inspired by the phenomenon of biomaterials that can survive through the millennia of time, Dr. White’s main research focus is on the best ceramic of all – natural tooth enamel. His research delves into unraveling the intricate architecture and degradation mechanisms inherent in this remarkable substance. Leveraging transgenic mouse models, he has elucidated the precise roles of genes and proteins involved in enamel formation such as amelogenin, the dominant enamel protein that self-assembles to form nanospheres that organize crystallites into rods,[9] and ameloblastin,[3] a key enamel protein that defines the outer boundaries of enamel rods. It is very easy to mess up natural biofabrication, but two customized enamels, harder than natural enamel, have been engineered.[7,8] More recently, Dr. White’s focus has been on pH maintenance, ion transport, and protein endocytosis during enamel mineralization.[4,6] Dr. White is working with Dr. Michael Paine at USC on phosphate transport, an understudied pathway that is essential to understanding biomineralization and enamel formation.

In order to understand the formation, organization, and carious destruction of tooth enamel at the molecular or nano-scale, Dr. White has teamed up with several physicists, principally Bert Muller and Hans Deyhle, in Switzerland. The group has used high-energy radiation from a



Description: A polarized light photograph "Teeth are beautifully complicated." The image was made by Dr. Shane White and Dr. Shihua Xue. The enamel shows Hunter-Schreger Bands, tiger-stripes; gnarled enamel, rounded tie-die patterns below the cusp tips; the earliest first formed aprismatic enamel close to the DEJ; layers of inner, mid and outer enamel; and an early fissure lesion, brown. In the dentin we can see the smooth curves of the tubules and the first-formed mantle dentin close to the DEJ.

This image was provided by Dr. Shane White.

linear accelerator in Germany, as well as enormous synchrotrons in Switzerland and the UK to interrogate the organization of protein and hydroxyapatite crystallites in enamel and dentin through hard X-ray nano-tomography, X-ray diffraction, and small angle X-ray scattering. They have discovered that even in a carious lesion that penetrates into dentin, enough structural information remains to not only remineralize enamel, but potentially to recreate the original nanostructure.[5] Last year, they used synchrotron radiation, a billion times brighter than the sun, to measure and describe the very earliest beginnings of enamel demineralization.

A significant crux of Dr. White's research investigates real-life applications of his work. Dr. White has published high-impact, translational papers addressing topics from the intricacies of prosthesis design, surface preparation, and firing rates, to the nuanced properties of translucent zirconia materials.[1] Additionally, his research has shed light on critical factors such as tooth substrate and porcelain thickness and area,[2] elucidating the chemical and mechanical factors that contribute to fatigue failure of ceramic restorations.[10] Remarkably, work that Dr. White conducted 20 years ago to address challenges in layered ceramic dental restorations found unexpected resonance in contemporary engineering, inspiring a novel predictive model for layered ceramic containment vessels in nuclear reactors, as recently demonstrated by engineers in the UK.

As a clinician and teacher, Dr. White is interested in the human side of care provision and patient outcomes. Dr. White's systematic reviews have provided guidance for choices among treatment alternatives, a better understanding of barriers to treatment such as patient fear of pain, addressed the limitations of dentists' knowledge of root canal treatment, and explored the vulnerabilities of the patients that we serve in our school.

Dr. White has mentored over 100 students, who have won many awards and embarked on successful careers of their own.

> When asked what advice he would give to dental students pursuing research, Dr. White responded, **"A benefit for dental students is learning how to pursue your curiosity and ideas in a rigorous and structured manner. Pick a lab with people that you like and people who will look after you."**

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Advancements in Dental Technology: Facial Scanning for Predicting Aesthetic Outcomes

DR. JULIE KIM

Kevin Tong

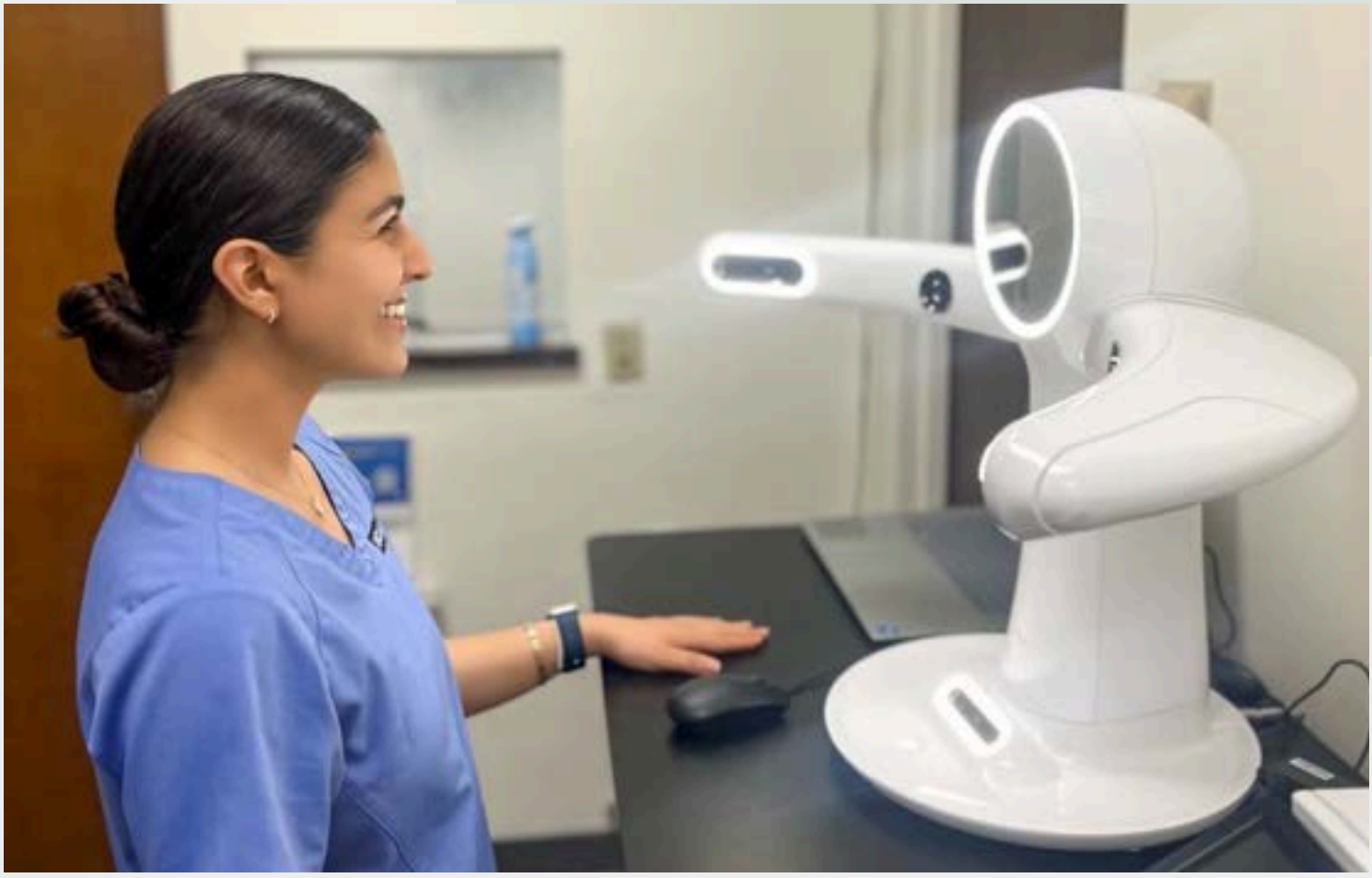
Dental treatment goes beyond restoring damaged or missing teeth; it encompasses fulfilling patients' aesthetic desires, achieving correct occlusal relationships, and contributing to positive self-image. Recent strides in digital dental technology, notably facial scanning, have transformed cosmetic dental treatments, offering more successful outcomes compared to conventional methods. Predicting and understanding potential facial changes after dental intervention is crucial, especially in cases involving significant vertical dimension alterations or in highly aesthetic areas.

Traditionally, dental technicians faced challenges in the aesthetic domain since they cannot directly observe patients when crafting dental prostheses. However, digital technology, specifically facial scanning, attempts to overcome these limitations. Utilizing dental CAD (computer-aided design), data gathered from jaw motion tracking, facial scans, and oral scans can be seamlessly merged to facilitate accurate diagnosis, treatment planning, and the fabrication of dental prostheses. The use of CAD can aid patients and providers by allowing them to visualize post-treatment results before the procedure has even begun.

The use of facial scanners has many applications in the clinical research setting and is currently being studied at the UCLA School of Dentistry by Dr. Julie Kim. Dr. Kim received her DDS from NYU before pursuing a Master of Public Health (MPH) from Loma Linda University as well as a Master in Oral Biology here at UCLA. Although there have been previous studies that report on facial changes through the use of facial scanning, they rely on the subjective claims of the dental provider and use changes in vertical occlusion as their outcome. In order to improve upon these studies, Dr. Kim aims to analyze three-dimensional changes in the vertical and horizontal dimensions of the face in response to alterations in anterior tooth thickness with a focus on aesthetic changes. From the results, she hopes to evaluate whether facial scanners can create reproducible results and be relied on as a diagnostic tool.

Dr. Kim is currently in the process of collecting facial scans of 30 patients meeting specific criteria, including normal vertical dimensions and facial profiles. In recent years, she has made it a point of emphasis to involve students as some of the candidates for her research studies since she wants to offer the opportunity for students to experience clinical research. Intraoral information will be obtained via an intraoral scanner and smile view facial scanning will be acquired using a facial scanner. The data gained from these scanners are then used to produce dental splints via CAD using the resting-state facial scan as the reference. Splints of varying heights and thickness will then be 3D printed to simulate changes in vertical dimension and anterior tooth changes, respectively. The participants will then place the dental splints in their mouth and another facial scan will be performed. Finally, the data will be compared to the initial scan, superimposed using a best-fit algorithm, and analyzed through statistical testing.

Advancements in facial scanning technology have ushered in a new era in aesthetic dental treatments. This study seeks to bridge the gap in previous studies by objectively analyzing facial changes resulting from dental interventions. Although patient outcome is never 100%, the findings from this study will contribute to refining predictions and enhancing the overall success of aesthetic dental treatments, further establishing facial scanning as an indispensable diagnostic tool in modern dental care.



Description: Third year student Ariana Kermani, who participated as an assistant researcher for Dr. Kim's study, is shown here taking a 3D facial scan.

UV-Photofunctionalization: The Future of Implantology

DR. TAKAHIRO OGAWA

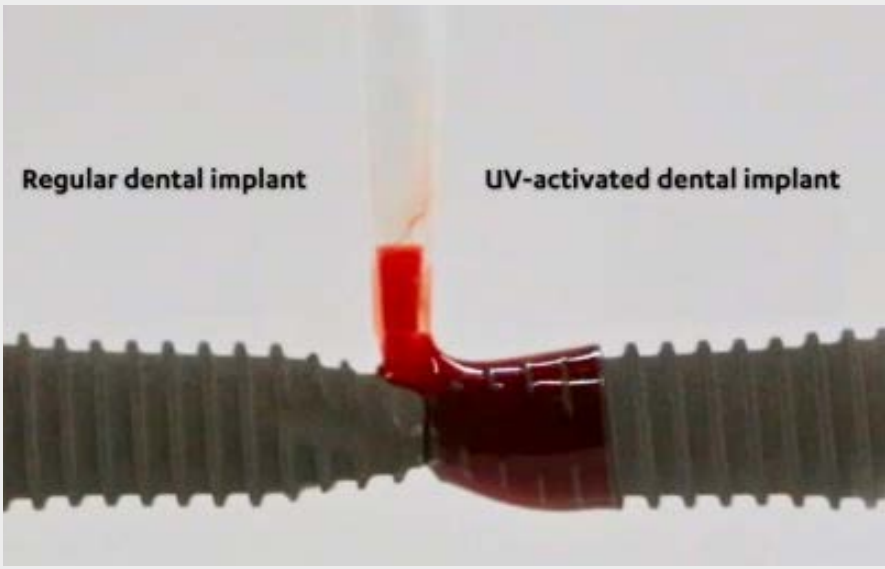
Nathan Yoshida

Initially trained in Japan, Dr. Takahiro Ogawa's transition to the United States nearly 25 years ago was motivated by a desire to teach and conduct research at the global level. With an expertise in prosthodontics and clinical occlusion, Dr. Ogawa began his time at the UCLA School of Dentistry as a postdoctoral researcher under Dr. Ichiro Nishimura. Now a Professor in the Division of Regenerative and Reconstructive Sciences and Weintraub Center for Reconstructive Biotechnology, and a leader of Team Surface, Dr. Ogawa has since achieved his initial aspiration of making a global impact in the scientific community through his groundbreaking work with dental materials and implantology. One of his team's most recent and exciting projects is their development of the UV-photofunctionalized titanium implant. This innovation in implant technology lays a groundwork for a multitude of potential future applications and is poised to have a significant impact on the future of dental care.

Dental implants are being used today more than ever before because of their preferable functionality and stability over alternative options, like a bridge or denture. However, while implants have become the standard of care in many cases, they traditionally exhibit flaws in their biologic compatibility, often leading to periimplantitis, incomplete osseointegration, and esthetic issues due to the progressive recession of bone and soft tissue. These were the primary concerns that Dr. Takahiro Ogawa and his team considered when developing the UV-activated titanium implant. Their research findings indicate that UV photofunctionalization notably enhances the biointegrative properties of dental implants. This is demonstrated by an impressive 98% bone-to-implant contact capability compared to the approximately 50% contact capability of regular implants. Additionally, UV-activated implants exhibited a five times greater number of osteogenic cells attaching to the implant surface in the initial stage, four times greater protein absorption to the implant surface, and three times faster osseointegration in the early healing stage compared to regular implants.[1]

Their studies have also shown that, compared to the traditional dental implant, photoactivation improves implant compatibility with soft tissue as well, allowing 40% higher fibroblast attachment after 24 hours and stronger adhesion onto these surfaces. This soft tissue seal is essential for preventing bacterial invasion into areas adjacent to the implant surface from the oral cavity.[2] These promising results benefit patients through faster healing times, reduced bacterial susceptibility, and fewer post-operative complications.

The primary reason behind the poor biologic compatibility of conventional dental implants lies in the presence of carbon impurities on the surface of titanium implants. This layer essentially renders implants hydrophobic, impeding their ability to fully integrate with bone and soft tissues of the jaw.[3] Dr. Ogawa and his team discovered that UV light, if properly utilized, could remove the layer of impurities, thus significantly enhancing the properties of titanium. In their pursuit of refining this technology, they identified that at a wavelength of 172 nm, vacuum UV (VUV) light efficiently decomposes the layer of hydrocarbons on the titanium's surfaces within just one minute.



Description: Comparison of the wettability of a regular dental implant to a UV-activated dental implant

By breaking down this layer of organic molecules, hydrophobic titanium implants become hydrophilic. This facilitates the recruitment, attachment, and proliferation of osteogenic cells on the titanium as well as promoting blood flow and protein recruitment.[3] These factors play a crucial role in ensuring the complete osseointegration of the dental implant and an adequate soft tissue adherence to the prosthetic components.

The applications for UV photoactivation extend beyond just dental implants. Dr. Ogawa and his team have proposed its use for other dental materials like zirconia and silica to enhance the biocompatibility of dental crowns, other maxillofacial implants and related prosthetic components, and even orthopedic surgical devices.[4] Dr. Ogawa explained that every surface harbors a layer of carbon impurities, and removing this layer can effectively enhance the biologic integration of many of the materials commonly used in dentistry and medicine. The versatility of this technology opens doors to a myriad of possibilities. Machines for UV photofunctionalization are already available and in use for implant procedures domestically and internationally. Dr. Ogawa noted that clinical trials will soon be their next step and are essential to validate the effectiveness of this new technology in the clinical setting. We are moving toward a future where UV photoactivation is used in every dental office and becomes standard for every dental implant and surgical procedure.

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Printing Perfection

DR. MIJOO KIM

Jason Ly Lee

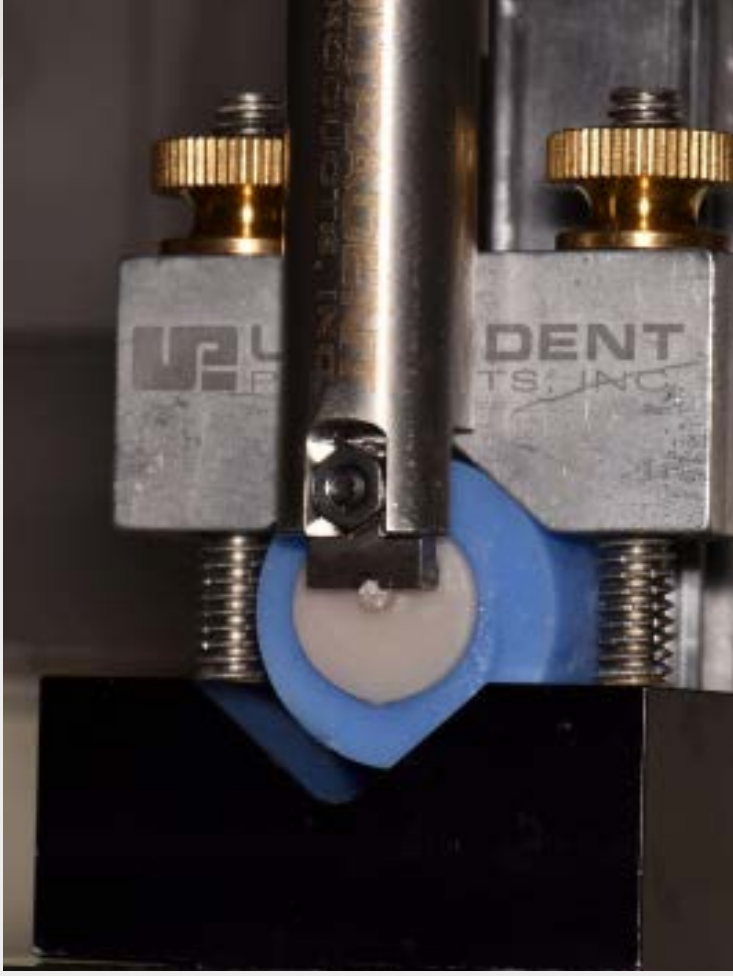
In the dynamic landscape of modern innovation, few technologies have revolutionized industries as profoundly as 3D printing coupled with Computer-Aided Design and Computer-Aided Manufacturing (CAD/CAM). Picture a world where intricate designs materialize with precision, layer by layer, transforming digital concepts into tangible realities. This captivating fusion of 3D printing and CAD/CAM has not only redefined the boundaries of creativity but has also become the cornerstone of cutting-edge advancements across diverse fields. Join us on an exploration of the mesmerizing realm where digital ingenuity converges with tangible craftsmanship, unlocking possibilities that were once deemed unimaginable. Welcome to the forefront of innovation, where 3D printing and CAD/CAM converge to shape the future.

Embarking upon the uncharted territories of 3D printing, Dr. Mijoo Kim, an esteemed assistant adjunct professor and director of the Restorative Dentistry Preceptorship Program, has long harbored a profound fascination for dental materials since entering the field of dentistry. Dr. Kim, an alumna of the Wonkwang University School of Dentistry in South Korea, culminated her educational journey with distinction in 2009. Subsequently, she furthered her scholarly pursuits, attaining both a Master of Science and a Ph.D. at the prestigious Yonsei University College of Dentistry in South Korea. Dr. Kim became a full-time faculty member at UCLA in 2023.

Dental resins employed in 3D printing are primarily photopolymer resins, undergoing curing or solidification upon exposure to specific light wavelengths, commonly ultraviolet (UV) light. Tailored for dental applications, these resins are meticulously formulated to ensure biocompatibility, mechanical robustness, and aesthetic excellence. While the contemporary 3D printing market asserts the feasibility of permanent restorations, skepticism persists due to the absence of established protocols for crown cementation, the types of resin materials, and uncertainties regarding the strength and durability of the final restoration. The skepticism surrounding the strength of 3D-printed permanent restorations largely stems from the relatively low filler content, with most photopolymer resins for 3D printing capping around 50%. Dental fillers play a pivotal role in enhancing the mechanical properties of the cured resin, contributing to improved strength, wear resistance, and overall performance characteristics.

The skepticism surrounding the strength of 3D-printed permanent restorations largely stems from the relatively low filler content, with most photopolymer resins for 3D printing capping around 50%. Dental fillers play a pivotal role in enhancing the mechanical properties of the cured resin, contributing to improved strength, wear resistance, and overall performance characteristics.

Dr. Kim's research endeavors to address these uncertainties by formulating a standardized protocol for 3D-printed final restorations. The current lack of standardized protocols in the industry, akin to those employed for traditional restorations like Zirconia, motivates the need for comprehensive guidelines in the cementation process and beyond. Illustrated in Figure 1, Dr. Kim is presently exploring a spectrum of cements, including Duolink, Variolink, Panavia, and RelyX Unicem2. This aims to discern the optimal cement or identify influential factors that contribute to longevity and strength. The fusion of 3D printing and CAD/CAM technology represents a transformative force that has reshaped industries and opened doors to unprecedented possibilities. Dr. Kim's research represents a pivotal step towards establishing a robust framework for the integration of 3D-printed final restorations. By addressing the existing uncertainties through the formulation of standardized protocols, her work fills a critical void in an industry that lacks structured guidelines. As her research endeavors continue to unfold, they promise not only to overcome current challenges but also to set a precedent for the future of 3D-printed dental restorations, ushering in an era of enhanced reliability and innovation.



Description: A Shear-Bond Test, a crucial evaluation assessing the shear bond strength of various cements applied to a 3D-printed disc. The objective is to gauge the effectiveness of these cements in bonding with the 3D-printed sample. This evaluation serves the purpose of establishing a standardized protocol for the cementation of 3D-printed permanent restorations.

What makes research exciting and what made you so interested in material science?

"I once grappled with the idea that dentistry might not be the right fit for me, questioning my suitability for the profession. The perceived challenges of a potentially dirty and hazardous job, coupled with the fatigue of meeting different patients every day in a clinic, almost led me to consider quitting dental school.

However, my perspective underwent a significant shift during the Dental Materials class in dental school. The fascination of manipulating machines and devising schemes to substantiate my hypotheses captured my attention. I discovered a passion for the intricacies of dental materials, realizing that even elements beyond my initial understanding could be mastered through persistent trial and error.

Post-graduation, my sentiments evolved as I began to derive satisfaction from interacting with patients. Despite this, I recognized the need for personal development and time to carve out my own niche within the field. The pursuit of an M.S. and Ph.D. was particularly challenging as I juggled caring for two babies during that time. The degree process added a valuable biological perspective to material science.

While working as a clinician in Korea, I realized that both the clinical track and research insight could be materialized at UCLA, prompting my move to an academic position last year. Working as a researcher and clinician can impact scientific improvement as well as personal interests. In this sense, I love my job and am willing to dedicate myself to my scientific findings. I hope to motivate student researchers, as experiencing an academic career might enlighten one's potential, as I discovered during my time as a student researcher."

An Interview with
Dr.Flavia Queiroz Pirih

Jennifer Gutierrez

What inspired you to pursue a career in research?

Early on in my dental education, I realized that the possibility of understanding the molecular mechanisms of periodontal diseases and conveying that knowledge to others would be very appealing as a career path for me. I knew even then that an academic career, which combined research and teaching, would be my calling.

What new research projects are going on in your lab?

As a board-certified periodontist practicing at the UCLA Faculty Group Dental Practice, I experience firsthand the challenges of treating periodontitis and peri-implantitis. Because of the challenges in diagnosing and treating those two conditions my research has focused on the pathogenesis of periodontitis and peri-implantitis.

Periodontitis is a major health concern that affects 47% of the population over the age of 30, 70% of the population over the age of 60, and is the number one cause of tooth loss in adults.

Studies demonstrate that approximately 50% of periodontitis is heritable; however, most of the contributing factors have not been identified/validated because periodontitis is a complex trait disease. As clinicians, this lack of information impairs our ability to better treat our patients. To address this problem, our laboratory is trying to identify genes that are involved in periodontitis development. In addition to periodontitis, periodontists are faced with the challenge of treating peri-implantitis. According to Derks, 14.5% of patients with dental implants will develop moderate to severe peri-implantitis. Unfortunately, peri-implantitis can only be successfully treated in approximately 50% of cases. As a practicing periodontist, I have experienced the frustration from both the patient and provider perspective of managing peri-implantitis. It is with this background in mind that my research group developed a murine model of peri-implantitis. This model has allowed us and others to begin understanding the pathogenesis of peri-implantitis and develop new treatment strategies.

How long have you been doing research?

"I started doing research in 2000 with Dr. Camargo and Dr. Tetradis.".

What legacy at UCLA are you trying to leave behind?

I want to bridge the gap between basic science and patient care, making sure that patients, students and researchers understand the importance of periodontal health. As a professor, my primary responsibility is to provide a strong foundation for students to become the best clinicians possible while opening their minds to the importance of periodontics so that they too can educate others towards sound periodontal health. My second main responsibility, in acting as a role model, is to provide opportunities to students to pursue their dreams. I deeply value the opportunities that were given to me and I am committed to facilitating the same for the new generation.

As someone who wants to get involved in perio research, any encouraging words?

"To me the most important aspect of getting involved in research is identifying a mentor that can help guide you, not only in research, but also in the pursuit of your goals and making sure that you always go the extra mile. There are many opportunities, just go for it."

UCLA School of Dentistry