

Bridging Futures

# EXPLORATIONS

in Dental Research

A QUARTERLY JOHN C GREENE SOCIETY NEWSLETTER

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## Passing the Torch

Remembering Dr. John C. Greene

Written by Morgan Nelson '19

*The members of JGS- the John C. Greene Society- would like to honor and memorialize the life of John C. Greene, our club's namesake. From humble beginnings in Kentucky, Dr. Greene become an influential researcher around the world, a policy maker in Washington DC and a visionary academic. He passed away on October 13, 2016 at the age of 90. We would like to focus on his accomplishments here at UCSF, where he served as Dean of the UCSF School of Dentistry from 1981-1995.*

After being an Admiral in the U.S. Public Health Service Commissioned Corps, and the Deputy Surgeon General of the United States (the highest-ranking dentist in the history of the U.S. government), Dr. Greene came to San Francisco to interview for the position of Dean at the dental school, which is when he developed his vision for the future of the dental school.

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## Research & Clinical Excellence Day

Every October, UCSF School of Dentistry dedicates a day to celebrating the research accomplishments of our dental students and research trainees known as Research and Clinical Excellence day (R&CED). This year marks the 14th anniversary of this event, with over 400 attendees and more than 60 presentations. Poster and oral presentations were given throughout the day, and prominent speakers were brought in to share from their fields.

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Photo Credit: Elisabeth Fall

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# PRESIDENT'S *Message*



Dear John Greene Society Members,

I would like to thank all of you for contributing to JGS this quarter and fostering a positive research community here at UCSF. Our society has grown tremendously since being established in 2002, and continues to represent UCSF's excellence in research.

Successful organizations are built upon strong foundations. JGS would not be where it stands today without Dr. John C. Greene's devotion to research and his students. We were deeply saddened by the passing of Dr. Greene on October 13th, 2016 and wish to commemorate his lifelong accomplishments and legacy, which we proudly bear through JGS. We thank all those who have generously donated to JGS in his remembrance, and will ensure these contributions are dutifully used to enhance Dr. Greene's vision for the organization.

Research and Clinical Excellence Day (RCED) continues to be one of our Fall Quarter highlights. We were honored to hear from Dr. Carol Summerhays (President of the American Dental Association) and Dr. Mark Kirkland (recipient of the Clinician of the Year Award), and to have faculty and colleagues present their case studies and research. RCED was especially meaningful to me as 23 of us participated as Summer Research Fellows and presented our work. We witnessed the culmination of months of experiments, data analysis, and preparation. Our research experiences enriched our education in evidence-based dentistry and our ability to think analytically. I highly encourage first years with even a slight interest in research to take the opportunity to perform summer research. It will help you grow professionally and catalyze valuable relationships with mentors. Furthermore, our work is more than educational; we tangibly contribute by advancing knowledge and developing new technology.

JGS' primary goal is to provide the best resources for dental student research. This quarter we hosted the elective "IDS 186: Current Issues in Dental Student Research" where students heard talks from our faculty about the fascinating research conducted at UCSF. We will continue to host this elective next quarter and hope to see the same level of engagement! Additionally, we held a proposal workshop to prepare students for applying to the Summer Research Fellowship and AADR. Lastly, we launched a new website: [www.jgsucsf.com](http://www.jgsucsf.com), where you can find research and fellowship opportunities at UCSF and beyond, as well as information from our workshops.

Next, we have the IADR/AADR 2017 coming up in March right here in San Francisco! We are excited to be the host city and to share our research and experiences with students from all across the nation. We will implement an Advocacy Challenge, where students can join dental advocacy efforts on state and federal levels, and learn about legislature relevant to dental research. Last but not least, we will host a Clinical Case Study Workshop in which D3 and D4 students will share their clinical experiences with their colleagues.

As always, please contact me at any time with feedback or ideas, and stay tuned on [jgsucsf.com](http://jgsucsf.com) and Facebook ("The John C. Greene Society") for upcoming events!

Warm Regards,

A handwritten signature in dark ink, reading "Linda Kim". The signature is fluid and cursive, with a long, sweeping underline.

Linda Kim | John Greene Society | UCSF LSRG Chapter President



# Passing the Torch

Remembering Dr.  
John C. Greene



CONTINUED FROM COVER

Morgan Nelson '19

Dr. Greene came to UCSF in 1981 when the school was dealing with many difficulties. The dental school was a million dollars in debt, the students were unhappy with the level of education they were getting in the basic sciences and only 71% of UCSF graduates had passed the state boards for clinic proficiency in 1980. He made rapid radical changes to almost every aspect of the way the dental school was run, by increasing emphasis of behavioral and public health components as essential to humanistic dentistry. He also decreased enrollment from 108 to 88 students with the aim to emphasize quality over production of numbers.

Dr. Greene also put a greater emphasis on understanding the basic biological sciences in order to diagnose and treat oral health problems. He emphasized providing good, comprehensive care, rather than just seeing patients in order to fulfill requirements for a certain number of bridges, fillings or crowns. He sought to raise the academic standard and scope of teaching by building a collaborative environment with other schools at UCSF and other dental schools and emphasized

dental students being involvement in “meaningful research.” Some of these changes, brought on so rapidly, were not always well-received, but under Dr. Greene’s leadership, the school was able to move forward.

In a few years, 90% of UCSF graduates passed the boards and the school became ranked third in the country. For these accomplishments, Dr. Greene credited the student body and “superstar” faculty, publishing research findings in quality journals and minority recruitment.

**"I began to see the real potential  
for this to be the outstanding  
school in the country, perhaps in  
the world."**

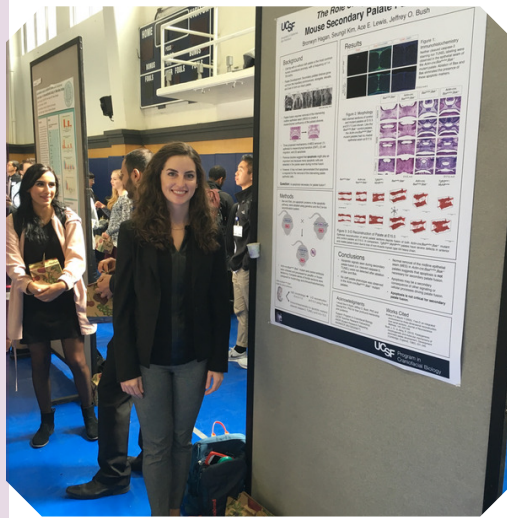
In speaking of the future of dental education, he stated that the challenges would be “to continue the trend to strengthen academic quality, to find the funding to sustainment what we have and to be able to attract the kind of people who are going to make it possible.” Regarding the future of dentistry itself, it was his desire that treatment

would continue to become more soundly based on science. He thought lasers would be used widely for the removal of caries, to reshape the tooth and for gingival surgery.

When asked what he would do for leisure after retirement, he stated that he would like to become reacquainted with his golf clubs, given to him when he retired as an Admiral from the Public Health Service after over 30 years of service.

Dr. John C. Greene lived a meaningful, influential life. He was the president of the American Board of Dental Public Health, the IADR and AADR. At UCSF, we know him as the person who was brave enough to have a strong vision for the future of our school and the perseverance to see those changes through in the face of numerous obstacles.

*The John C. Greene Society, one of the most respected and vocal student research groups, proudly bears his name. In the last newsletter, we wrote about the most recent changes being made to the dental curriculum, which center around the inclusion of Evidence-Based Dentistry. In supporting the research-based changes being made in our curriculum, we are continuing the legacy of Dr. Greene, who embraced innovation: "Once you've stopped changing, you're no longer a leader."*



## Bronwyn's "Wyn"

*Bronwyn Hagan '19, winner of the Ernst Newborn Award for Research Excellence, reflects on her summer research experience.*

This summer was the most challenging yet rewarding time of my life. With no prior research experience, I stepped into lab on June 13th and began my crash course in craniofacial biology and wet lab research. To say the least, this summer I had a lot of "firsts." It was my first time isolating mouse embryos and embedding them in paraffin. It was my first time performing immunohistochemistry and H&E staining and imaging thousands of sections. Finally, it was my first time analyzing real data produced from our meticulously planned experiments. I am thankful to my mentor, Dr. Jeffrey Bush, and my Post Doc, Dr. Seungil Kim, who guided me throughout every step. They took the time to teach me every technique and troubleshoot with me when something inevitably went wrong, such as when I forgot to add the second immunohistochemistry marker or when I accidentally took perfect sections of the abdomen (oops!) rather than the secondary palate. I am fortunate to say that I have come a long way since those early days. Not only did I learn specific research skills this summer, I gained appreciation for research itself: the time, energy, and thought that goes into each and every experiment.

My research examined the role of apoptosis in secondary palate fusion. While apoptotic cells are always found in the midline seam, previous studies had not concluded whether or not programmed cell death was the mechanism responsible for palate fusion. Using a mutant mouse model, we unexpectedly found that apoptosis is not necessary and that mice lacking apoptotic pathways undergo normal palate fusion. Rather, it is likely that apoptosis is only a secondary consequence of our signaling or cellular processes driving palate fusion. The results from this project were both surprising and exhilarating, and it's a thrill I won't soon forget.





# WELCOME!

WE ARE EXCITED TO ANNOUNCE OUR NEW ASSOCIATE DEAN FOR RESEARCH, DR. THOMAS LANG. IN HIS FIRST FEW MONTHS IN HIS NEW ROLE, WE HAVE BEEN INSPIRED BY HIS STRONG LEADERSHIP AND LOOK FORWARD TO MANY YEARS UNDER HIS DIRECTION.



FROM DR. LANG:

As Associate Dean for Research in the School of Dentistry, one of my tasks is to help oversee the Summer Dental Student Research Fellowship Program. The opportunity to engage in research profoundly changes our students, whether they go on to pursue careers in private practice or assume positions in academic dentistry. Our Summer Dental Student Research Fellowship Program gives young men and women a chance to learn the methods, tools, and language of science from leaders in the field and embark on research in the areas they are most passionate about. This success of this program is key to the future of Dentistry, both in Research and in Clinical Practice, the former by creating a pipeline for development of Dental Clinician/Researchers and the latter for promoting the success of evidence-based practice in the Clinic. Thus, it is one of my goals to grow this program so that every qualified Dental Student who is interested will have the support to spend a summer working in one of our outstanding research labs, an experience that can make a difference over a lifetime.

In addition to supporting the Summer Research Fellowship, I also, together with several of my faculty colleagues, help oversee the Oral and Craniofacial Sciences Program. This long-running program trains

our DDS/PhD and PhD students and is funded by the School of Dentistry, the UCSF Graduate Division and a T32 grant from the National Institute of Dental and Craniofacial Research. Because it provides the academic and financial framework through which graduate students engage with our research program, it is one of the engines of our School of Dentistry research program, which has been ranked #1 in the country for the past 24 years.

Another of my tasks as Associate Dean for Research is to help Dean Featherstone to provide the resources that our investigators need to be successful. This includes supporting seminars and symposia which foster scientific interactions, providing seed funding for projects that will one day mature into major studies supported by NIH and other agencies, and providing and maintaining research space that allows investigators to carry out their studies in state of the art research facilities.

## **Thomas Lang**

Professor in Residence, Radiology and Biomedical Imaging

Associate Dean for Research, School of Dentistry

# R&CED

## Research & Clinical Excellence Day 2016

As the essential connection between oral and overall health is being understood more these days, R&CED presents some of the best oral health findings with which to make research-based changes for the future of healthcare. The National Institutes of Health funding testify to the importance of research at UCSF, with the School of Dentistry ranked first in NIH funding for biomedical research for the 26th year in a row, receiving \$15.5 million in grants in 2015. UCSF overall ranked first among public schools receiving funding.

"Once again, I was inspired and energized by Research and Clinical Excellence Day," said Michael McMaster, PhD, committee chair. "The School of Dentistry community coming together for this special day, to celebrate our accomplishments and commitment to excellence in patient care, discovery and education, is something we should all be proud of."

Plenary speaker Carol Summerhays, DDS, president of the American Dental Association, spoke on "What It Means to Be America's Leading Advocate for Oral Health." She addressed the future of dentistry in the U.S. for those of us entering the field in a few years time.

The Spotlight on Clinical Excellence featured Chirag Patel, DMD, MD, discussing "Oral and Maxillofacial Surgery in the Information Age: Two Case Presentations."



Dr. Carol Summerhays, DDS  
Photo Credit: Elisabeth Fall



Dr. Chirag Patel, DMD, MD  
Photo Credit: Elisabeth Fall

**The Clinician of the Year award went to Mark Kirkland, DDS, associate dean for clinical affairs and director of the International Dentist Program. In his speech, "My Journey", he told humorous and poignant stories on his path to becoming a dentist.**



**Richard Schneider, PhD, was named Mentor of the Year. His mentor this last summer, Grace Zhu, spoke highly of his mentoring with her project involved in the quail-duck hybrid, the "quck." She thanked him for taker her under his "quck" wing.**

**Morning and afternoon oral presentations were moderated by Andrew Jheon, DDS, PhD. Presenters included Raymond Lee, Bronwyn Hagan, Tiffany Han, Taranvir Cheema, Alex Romash, Arvin Pal, Rebecca Kim and Grace Zhu.**



**Raymond Lee '19**





*AADR and Friends of NIDCR will visit Capitol Hill for Advocacy Day on Tuesday, February 28, 2017 to educate a newly elected Congress on the importance of dental, oral, and craniofacial research. This event will include a briefing on key issues, a training session, and individual and/or small group meetings with participants' members of Congress and their staff.*

Written by Linda Kim '19

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Advocacy is crucial for the formation of policies that directly impact our profession by determining state and federal spending on biomedical research and oral health services. Such spending includes support for dental schools, subsidies for residency programs, reimbursement policies of public insurance programs, mandated benefits, and additional financial incentives ("Chapter 5: Expenditures and Financing for Oral Health Care. Improving Access to Oral Health Care for Vulnerable and Underserved Populations". National Academies Press; 2011). Dentists need to inform legislators about the importance of these programs in order to best advance the health of the public. This is especially true for major new initiatives of broad societal importance that relate to our profession, such as Vice President Biden's Cancer Moonshot.

Fortunately, dentistry is represented by some accomplished advocates in the legislative branch. This year, American Dental Association (ADA) member Dr. Drew Ferguson (GA), won election to the 115th Congress ("Four ADA members elected to Congress". 2016. <http://www.ada.org/en/publications/ada-news/2016-archive/november/four-ada-members-elected-to-congress>. Accessed Nov 12th, 2016). Three other ADA members, congressional incumbents Drs. Brian Babin (TX), Paul Gosar (AZ), and Michael

Simpson (ID) won re-election with significant majority votes in their respective districts. All four candidates are general dentists. Reps. Babin, Gosar and Simpson have been advocates for oral health and have sponsored numerous oral health bills.

Dental students are the future of the profession, so they too must be involved in advocacy. In fact, students have played a role in several policy changes that improved the education and practice of dentistry. These victories include getting scholarships administered by the National Health Service Corps and U.S. Armed Forces exempted from taxation, extending additional borrowing for health professions students in the unsubsidized Stafford Loan program, and passing Proposition 56 which raises California's tobacco tax by \$2 - a recent development that will save thousands of lives, save the healthcare system billions of dollars, and provide much more funding for Medi-Cal provider reimbursements ("Prop. 56 passes; major win for oral health". 2016. <http://www.cda.org/news-events/prop-56-passes-major-win-for-oral-health>. Accessed Nov 12th, 2016).

Advocacy Day is a wonderful opportunity to visit our nation's capitol, meet other students and professionals, and directly shape how the legislative agenda will affect dentistry. If you are interested in attending Advocacy Day, please contact me at [linda.kim@ucsf.edu](mailto:linda.kim@ucsf.edu) by December 12th, 2016. If enough students express interest, we will organize a group to go to Washington D.C together and represent UCSF's dental student community!



# Remembering Dr. Howard Barkan

Contributed by Ivy Vuong '19

*This past summer, we lost an enthusiastic mentor who has contributed a wealth of knowledge to public health research. UCSF students who had the immense privilege of working with Dr. Howard Barkan wanted to honor him and his work. Here's what they had to say:*



## Priyanka Athavale UC Berkeley UCSF Joint Medical Program, Year 1

"I feel so privileged to have had the opportunity to work with and learn from Howard Barkan throughout the past three years. I first met Howard over the phone, when I was advised to contact him to send me some data sets for my research project. What I anticipated being a brief and formal exchange of email addresses turned into a full hour of laughter. This introduction was characteristic of nearly every interaction Howard and I had for the next three years: Howard was a wealth of knowledge and made potentially stressful research experiences lighthearted and fun. From all-day tutorials about how to do various SPSS analyses to after-hours phone calls about how to troubleshoot confusing data, Howard was always ready and willing to help. Howard made my and so many other students' research projects possible, our analyses simple, the results meaningful, and our overall experiences fun; I am so incredibly grateful for all of Howard's support, guidance and inspiration."

## Madhurima Ganguly UCSF School of Dentistry ID4

"I have had the pleasure and honor of working with Dr. Barkan over the past couple of years while doing data analysis for the India Smiles project. I also worked closely with him for planning a separate analysis in Nepal to look at associations between early childhood caries and maternal caries risk. He was ever ready to help students in every way he could, and I remember his responsiveness to email even at odd hours. And speaking of email, he always signed off with a Namaste! Besides being so warm and friendly, he was extremely knowledgeable and I consider myself lucky to have gotten a chance to learn from him. He has always been a great mentor and will be surely missed."

## Ivy Vuong UCSF School of Dentistry, D2

"My first memory of meeting Dr. Barkan was at a joint meeting with several other oral health project teams at UC Berkeley. He came to host a tutorial for undergraduates working on public health research and he immediately captured all of our various interests, unified our goals, and expressed to us

how much our work could contribute to public health research. Since then, the Vietnam Tooth Project team has had the privilege of learning statistics under the guidance and inspiration of Dr. Barkan. Conducting research as an undergraduate student initially was extremely daunting to me. At the time, I felt that I did not have the toolkit and skills to use take our data and translate it into meaningful analysis. Yet, Dr. Barkan was able to teach our cohort the basics and quickly transitioned into teaching us more intricate statistical tests. Earlier this year, Dr. Barkan was supportive and encouraging in helping me spearhead my own research project as a dental student. He was pivotal in teaching me to think critically by breaking everything down to the minute details. My interest in statistical analysis and public health research would have never been cultivated without the inspiration of Dr. Barkan. Dr. Barkan is not only a skilled statistician but also a passionate educator. He brought along his fun, unique charisma to every meeting and would always lighten up the meetings with so many of his jokes. I feel incredibly fortunate to have been able to know and to work with Dr. Barkan. He has contributed an immense amount of his expertise to oral health research among many of his other interests and truly a wonderful all-around person to know and to work with."





**What exactly is a smart retainer?**

The idea of a smart retainer is to be able to monitor patient compliance with retainers, and also our hope is to incentivize patients to wear their retainers. Often when we finish treatment, patients will get retainers, and usually in kids, they don't wear them as often as they should, and sometimes this can lead to relapse of the teeth. Occasionally, this necessitates retreatment, which isn't fun for anybody, so we really want patients to wear these retainers full time, usually during first six months. Right now, there's no way really to monitor this other than having the patient come in and you're looking to see if the retainer fits. There's two retainers out on the market that do a similar thing – that is, they're trying to track compliance, and they have a device inside that's measuring wear time. However, with these appliances, they don't have Bluetooth technology, so they're relying on the patient to come into the orthodontists' office to basically plug it into a USB port. That's really a limiting factor because at that point, the patient's already in your office, and you can take a look to see if they're wearing it or not. We really want something that can real-time track these and not require the patient to come in as often for visits. That's where our retainers are novel in that it's using Bluetooth technology.

In addition to that, we've made an app. Right now, it's on iOS. For ipods/iphones, you can get this app, and that's what you'll use with [the retainer]. The patient will sync the data that goes in the app, and that goes to the cloud database, which the orthodontist can then pull down at their computer in the clinic. In the future, we want to make the app more user friendly and make it kind of fun, where the patient will earn rewards – maybe points or different things – that they can then get prizes with if they reach a certain amount of wear time. That's where we think that will also help out trying to incentivize kids to wear their retainers more and not just tracking them.

**How easy do you think it will be to train dentists to use this product, and what are some barriers you think will prevent them from participating in this program?**

There are two retainers that are out there, but they're not well accepted at this point. I think the reason for that is because you have to have a docking station, which is expensive, and the patient has to come in and sync this. Our retainer/appliance is different, and we think that's going to make it a lot easier to implement for orthodontists to use because it's much cheaper. When we mass produce these, the retainers themselves would only cost an additional \$20 to make. It's not that much additional cost, and you don't need a docking station, or you don't need anything different. There's just a web page to use. The hurdles to implementing this in a practice are much easier.

# Smart Retainers

Interview with Dr. Eric Castle,  
3rd year orthodontics resident  
Written by Sarah Pi '19

**Does this technology add to the thickness of the retainer?**

It is a little bit thicker. You're adding maybe two mm of thickness to the retainer. I've worn this myself. It's definitely tolerable, bearable. It doesn't affect speech that much more. It's not as bad as you think, so I don't see this as a barrier.

**What results do you anticipate or hope to see from the upcoming pilot study?**

We're excited about that. We'll be having five residents here wearing these for a week. Each of them will be loaned an ipod to use with the app already preinstalled on it. The pilot trial is just to confirm that the app is easy to use, we're able to sync the data with no problems, that the retainers are really accurate and shows that the wear time that it recorded is the same as what [the residents] recorded in the log book. This is just to really confirm everything that we've been doing so far. If the results are very positive, which we feel they will be, then we're going to move ahead with the clinical trial here in clinic, which we already have CHR approval for. That will be a larger trial, and we're hoping for around 30 patients to be enrolled in that trial.

**With the Bluetooth technology, would the smart retainer be able to last just as long as a regular retainer? Is this monitoring of progress temporarily aimed for maybe the first year following completion of treatment, or is this meant to be a lifelong commitment?**

That's another big part we're working on. The important part that we're concerned about is generally the first six months because that's when we want patients to wear retainers full time...because that's how long it takes for the bone and everything to adjust to the new tooth positions to get stability. We are trying to get it to last six months. After that, the retainer is still functional, but the battery will be dead. You would no longer get compliance tracking, but usually after six months, you go to night time only. At that point, patients will readily do that. We don't have a problem with patients wearing these at night; it's just at full time. We're working on a prototype II design already that's going to have different modifications to make the battery last longer.





# Let's welcome the newest members of our board!



## JGS Officers 2016-17

\* new board member

President: Linda Kim

Vice President: Arvin Pal

Secretary: Grace Zhu

Treasurer: Adel Ahn\*

Communication Liaison: Corissa Chang

Journal Club Coordinators: Thomas Nguyen & Karena Craemer

Junior Journal Club Coordinator: Duy Bui\*

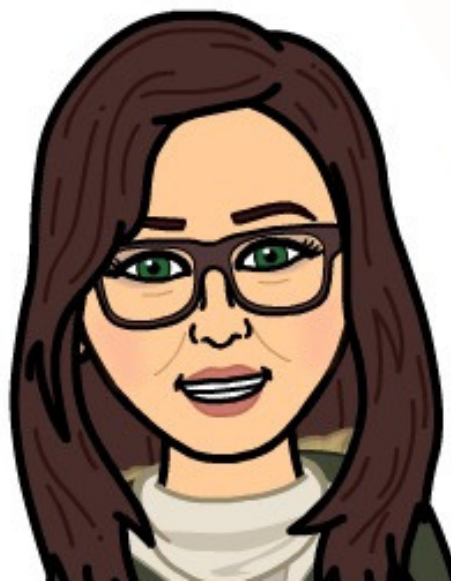
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D3 Rep: Caleb Tam

D2 Rep: Andrew Huang

D1 Rep: Shaun Abrams\*



Well, folks, that's it for this issue. Thanks for reading and check us out on our new website: [jgsUCSF.com](http://jgsUCSF.com).

Morgan Nelson | Newsletter  
Editor-In-Chief