USING THE LATEST DIGITAL TECHNOLOGIES, DEPARTMENT OF ORAL SURGERY ADVANCING INTEGRATED CARE
Moving Forward

AS I PREPARE to move on from my role as Dean at the end of December, I thank the entire Penn Dental Medicine community for an extraordinary eight and a half years. Leading the School has been the major honor of my life. Yet, it has hardly been leading in that every one of you are leaders — our illustrious faculty, staff, students, and alumni all make Penn Dental Medicine an exceptional school. I am humbled to have had the opportunity to serve this great institution and to have worked with so many committed to Penn’s legacy of leadership in dental medicine.

The School’s rich history and reputation for excellence is built on the unique talents, accomplishments, and contributions of the faculty, staff, students, and alumni of each generation, and it would be fair to say the current efforts of the Penn Dental Medicine community are exceptional across all fronts. Faculty have come together to inspire each other, collaborate in new ways, and strengthen the School’s research/scholarship and academic programs. Our students continue to excel and are the best and brightest in dentistry. And, by incorporating the latest technologies and state-of-the-art facilities, Penn Dental Medicine is leading in the provision of high-quality dental care. In addition, the level of philanthropic support and engagement from alumni and industry has been significant in furthering our mission. I feel confident in our strong position nationally and globally today and in the future thanks to the work and dedication of so many.

The search for my successor is well underway with a consultative committee of faculty, students, and alumni, and until that search is complete, Dr. Dana Graves, Vice Dean, will be serving as Interim Dean beginning in January. With his background in research, administration, and clinical practice, we are fortunate to have Dr. Graves lead the School during this transition.

I look forward to the further growth and success of Penn Dental Medicine and will continue to seek ways to support our School and the many Penn colleagues I’ve had the pleasure of meeting. I will forever champion the School’s exemplary work in advancing dental education, research, and patient care.

Heartfelt best wishes,

Denis F. Kinane, BDS, PhD
Morton Amsterdam Dean
Looking Back, Moving Forward
Q&A with Dean Denis Kinane as We Look Back on Initiatives within Education, Research, and Patient Care Advanced over His Tenure

Fostering Interdisciplinary Patient-Centered Care
Incorporating the Latest Technology, Research, and Integrated Care, the Dept. of Oral & Maxillofacial Surgery is Making Patients Whole Again

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SPECIAL SUPPLEMENT
Research Review: Highlights from 2017 Research Conferences

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Penn Dental Names Dr. Ricardo Teles Department of Periodontics Chair

Following an extensive search for the leadership post in the School’s Department of Periodontics, Penn Dental Medicine welcomed Dr. Ricardo Teles as Professor and Chairman, effective August 15.

“We are excited to have Ricardo leading our Department of Periodontics,” says Morton Amsterdam Dean Denis Kinane. “He has the vision from both a clinical and research perspective to ensure Penn periodontics continues to excel.”

Dr. Teles comes to Penn Dental Medicine from the University of North Carolina School of Dentistry, where he served as OraPharma Distinguished Professor in the Department of Periodontology since 2014 and Vice Chair of the Department since 2015. Part of The Forsyth Institute since 2003, Dr. Teles most recently served as Senior Research Investigator (2014–2017) in the Department of Applied Oral Sciences within the Center for Periodontology. From 2010–2014, Dr. Teles also held the appointment of Associate Director of Forsyth’s Center for Clinical and Translational Research and served as the Center’s Director from 2009–2010. Since 2003, he was also a clinical instructor in periodontics at Harvard School of Dental Medicine.

A native of Brazil, Dr. Teles earned his DDS (1988) at Federal University of Rio de Janeiro, Rio de Janeiro, Brazil. Dr. Teles holds a DMSc (Oral Biology, 1996) and a certificate in periodontology (1996) from Harvard School of Dental Medicine. Dr. Teles is Board Certified in Periodontology and Dental Implant Surgery.

An accomplished researcher, the overarching focus of Dr. Teles’ research is on the cause and treatment of periodontal diseases. Dr. Teles has been the principal investigator and co-investigator on many NIH-funded clinical trials focusing on the etiology and pathogenesis of periodontal diseases and the clinical and biological effects of periodontal therapies. The Teles lab also conducts bench research focusing on the interplay between subgingival polymicrobial biofilms and mediators of the immuno-inflammatory host response. In addition, his lab has developed sophisticated in vitro and ex vivo biofilm models to examine the susceptibility of these structures to antimicrobial agents.

Dr. Teles’ wife, Dr. Flavia Teles, has also joined the Penn Dental Medicine faculty as Associate Professor, Department of Microbiology.

Supporting a New Class of Scholars

For the incoming Class of 2021, the Penn Dental Medicine Dean’s Scholarship program continued to support and attract top students from across the country and around the world. Within the 134-member freshman class, 53 Dean’s Scholarships were awarded in amounts that ranged from $10,000 to $40,000. As long as students remain in good standing, the scholarships renew annually throughout their four-year DMD program.

“Scholarships play a crucial role in competing for applicants,” notes Dr. Olivia Sheridan, Assistant Dean for Admissions. “And, we are pleased to be able to offer this support.”

All accepted applicants, including international non-residents, are considered for the scholarships. Selection criteria includes academic performance and achievement, a broad range of intellectual interests, a diversity of interests outside academics, demonstrated leadership, and unique life experiences that may contribute to a dental career.

ABOVE: Some of the Class of 2021 Dean’s Scholarship recipients at the White Coat Ceremony, which welcomed the class to the study of dental medicine in August.
By the Numbers: Recent Grads & Incoming Students

CLASS OF 2017

62% OF THE 148-MEMBER CLASS WENT ON TO POSTDOCTORAL STUDY

- 36% entered specialty programs (endo, OMFS, ortho, pedo, perio, and pros)
- 22% entered AEDG or general dentistry residencies
- 4% entered postdoctoral study in the military
- 35% pursued general practice
- 2% entered U.S. military practice
- .5% entered public health
- .5% joined dental supply companies

CLASS OF 2019 PASS STUDENTS

18 COUNTRIES REPRESENTED IN THIS 31ST CLASS OF THE PASS PROGRAM

- 33 foreign-trained dentists (9 men and 24 women) from around the world joined the second-year class in January 2017 as part of the PASS program

CLASS OF 2021

134 STUDENTS MAKE UP THIS YEAR’S FRESHMAN CLASS

- 81 WOMEN AND 53 MEN SELECTED FROM MORE THAN 2,200 APPLICANTS

- 25 states represented in this year’s freshman class (for the first time in many years, PA is 1st with 20, NY follows with 16, and NJ and CA tied for 3rd with 15)

- 6 foreign countries (Australia, Barbados, Canada, France, People’s Republic of China, and South Korea)

- 23 Languages — from Afrikaans to Vietnamese — are spoken by the students

- 51 students have relatives who are dentists, 9 with relatives who are Penn Dental Medicine graduates

- 11 varsity sports represented (basketball, crew, cross country, field hockey, rowing, sailing, soccer, swimming, diving, tennis, and volleyball)

- 20 musical instruments played (guitar, piano (most popular), keyboard, Indian percussion instruments, drums, harp, viola, violin, French horn, flute, piccolo, saxophone, cello, trumpet, clarinet, trombone, oud, marimba, ukulele and xylophone)

Penn Dental Awarded $650K Delta Dental Grant to Expand PennSmiles Community Outreach

Penn Dental Medicine has been awarded a $650,000 grant from Delta Dental of Pennsylvania and its affiliates, to expand the School’s community outreach efforts. The grant supports PennSmiles, the School’s longstanding oral health education and clinical care program for school children and their families in West and Southwest Philadelphia, providing funds for a new mobile dental vehicle as well as the operational costs for educational programs.

“PennSmiles is our flagship program in terms of bringing oral health education and dental care to the community,” says Dr. Joan Gluch, Chief of the Division of Community Health. “Funding from Delta Dental of Pennsylvania is allowing us to replace the 14-year-old existing PennSmiles bus with a modern, new dental bus, thus ensuring continuity in care for the school children we serve.”

The school- and community-based oral health education component of PennSmiles launched in 2000 in partnership with the School District of Philadelphia, and since 2003, Penn Dental Medicine students and faculty have also been providing comprehensive dental care aboard the PennSmiles dental bus. Presently, the PennSmiles program works with 24 pre-school, elementary, and middle public and charter schools in the neighborhoods within approximately 24-square-miles of the University of Pennsylvania. In the current academic year, all predoctoral dental students will participate in Penn’s service-learning courses in community health, which include the PennSmiles education, preventive, and dental care programs.

“Delta Dental and PennSmiles have a shared goal of improving the oral health of Pennsylvania residents,” said Kenneth Yale, DDS, chief clinical officer for Delta Dental. “We’re pleased to help PennSmiles expand their community outreach with a new dental vehicle to help underrepresented communities become healthier.”

The new PennSmiles dental vehicle is replacing the existing bus, which will continue on a part-time basis, enabling the school to provide oral health education and clinical care to 5,000 children in the 2017-2018 academic year. Like the original, the new PennSmiles bus is designed as a 40-foot vehicle, featuring two dental operatories, fully outfitted for comprehensive dental care, with electronic dental records and digital radiology capabilities.

The exterior design mimics the original bus with its bright red cab and vibrant photography. “When residents see the PennSmiles bus, they see a tangible commitment from Penn Dental Medicine to improve the oral health of children in our community,” adds Dr. Gluch.

The new PennSmiles vehicle, developed with Mobile Specialty Vehicles of Jasper, Texas, debuted at a Mobile Health Clinics Association meeting in Phoenix, September 17, and arrived at Penn Dental Medicine on September 26.

ABOVE: The new PennSmiles bus arrived at Penn Dental Medicine in late September.
ONCAMPUS

STUDENT PROFILE:
PASS STUDENT, WAEL ISLEEM (D’18)

A Life-Changing Journey

PENN DENTAL MEDICINE’S Program for Advance Standing Students (PASS), designed for graduates of foreign dental schools who want to practice in the United States, will have graduated 888 students from 83 countries over its history when the Class of 2018 earns their DMDs this spring. The PASS students, who join the second-year DMD class each January, arrive at Penn Dental Medicine with unique personal histories. While many of their stories are inspiring, few are more harrowing than that of Wael Isleem, D’18, who came to the United States from Aleppo, Syria in 2013, in the midst of his country’s deadly civil war.

Wael, 29, a Syrian native who had wanted to be a dentist since his middle school years, had invested five years of his life as a student at Aleppo University School of Dentistry — earning a degree in dentistry and then pursuing postgraduate work in periodontics — when frequent, violent clashes in the region closed his school. Wael’s parents, brothers, and sisters urged him to leave Syria as soon as possible in order to complete his education in a safe environment.

Although leaving his family behind was difficult, “I knew the U.S. was the best destination for me,” Wael says. “I also knew that it would be much easier for a single man traveling alone to get out of the country.” (Soon afterward, Wael’s family also relocated, to a stable location in the Middle East.)

Morning came and, after more questioning, Wael was at last permitted to cross the border into Lebanon. From there, he was able to catch a flight to Jordan, and soon afterward, he came to the United States.

A FRIENDLY RECEPTION

A family friend in North Carolina gave him a place to stay and helped him find a position as a dental assistant, where he worked while applying to dental schools. Friends in Syria and the United States had spoken highly of Penn, and Wael was thrilled to be granted an interview for the PASS program in 2016, where he met Dr. Uri Hangorsky, Director of PASS, and Dr. Heywood Koch, Clinical Associate Professor of Restorative Dentistry “They were so friendly and really wanted to get to know me,” he says.

He has been impressed by his fellow students as well. “From the first day, I looked around and thought, ‘I am sitting with well-educated people from all over the world who are eager to learn,’” he remembers.

Wael immediately felt at home in Philadelphia, where the old buildings and the city’s storied past reminded him of his history-rich homeland. He has also made a home at Penn Dental Medicine.

“It’s a great environment,” he says. “Even though I am from another country, I never felt out of place here. It’s comfortable for everyone.”

— WAEL ISLEEM (D’18)

CROSSING TO A BETTER FUTURE

Wael hired a private taxi for the first leg of his trip, which lasted seven hours and took him through a series of security checkpoints en route to the Syria-Lebanon border. At each, armed soldiers questioned him closely, but allowed him to proceed. When he reached the border, however, he was held overnight, and felt sure he would be forced to go back.

“The Syrian regime was trying to keep residents with medical backgrounds in the country,” he says, remembering a tense and sleepless night. “I was concerned that I might never get across to Lebanon. If I didn’t get out of Syria, I had no idea what my future would be.”

“See the big picture.” He says of his escape from Syria. “Dentistry is my passion, and I am so grateful to continue my education here at Penn.”
Penn Dental Presents Biofilm Symposium in Beijing

Bringing together researchers from throughout China, Penn Dental Medicine recently presented a symposium in Beijing in collaboration with State Key Laboratory of Oral Diseases within Sichuan University’s West China School of Stomatology. Titled Biofilms, Microbiomes and Oral Diseases: Challenges and Future Perspectives, the September 30 program was held at Penn Wharton China Center (PWCC) — the second symposium to be presented by Penn Dental Medicine through support from Penn’s China Research and Engagement Fund (CREF).

The School was among the inaugural recipients of the CREF awards, established by the University to stimulate and support activity in China and engagement with the Penn Wharton China Center, which opened in March 2015. Penn Dental Medicine’s CREF grant, Advancing Research and Clinical Practice, includes three research symposia — one on bone biology, which took place in 2016; the recently presented biofilm program; and a third on stem cells, tentatively planned for 2018. The CREF grant will also fund a conference on the delivery of dental care in China.

Dr. Hyun (Michel) Koo, Professor of Orthodontics and Divisions of Pediatric Dentistry & Community Oral Health — a co-principal investigator on the CREF grant — led the development of the biofilm symposium. The program included lectures by Dr. Koo and Morton Amsterdam Dean Denis Kinane, along with seven leading researchers from schools throughout China addressing a variety of biofilm-related topics from mechanisms of biofilm virulence to novel therapeutic approaches.

The participating lecturers represented Sichuan University, Fudan University, two institutes within the Chinese Academy of Sciences, Chinese Medical University, Shanghai Jiao Tong University, and Peking University. A poster session and competition featuring research of postdoctoral/junior faculty and graduate students was also part of the program. Symposium sponsors included Proctor & Gamble Technology (Beijing) Co., Ltd; Colgate-Palmolive (China) Co., Ltd; Personalbio; and Major Bio.

“The day provided a platform for discussion on the best ways forward to learn more about this critical component in oral diseases and to find new ways to prevent them,” says Dr. Koo. “I think the connections made could lead to greater collaborations with top scientists in China in the future that are mutually beneficial as biofilm-associated oral diseases plague both the American and the Chinese populations.”
ONCAMPUS

New Online Coursera Course Explores Ties between Medicine and Dentistry

Penn Dental Medicine has launched its second course through Coursera, the online educational platform that offers universal access to courses developed by top universities and organizations around the world. The course, titled “The Oral Cavity – Portal to Health and Disease,” opened for enrollment on Coursera’s web site, www.coursera.org, in September and will continue to be offered on a rolling basis.

The course addresses the connections between dentistry and medicine and is presented in an interview format led by Dr. Uri Hangorsky, Clinical Professor of Periodontics and Associate Dean for Student Life at Penn Dental Medicine. Specialists in seven areas of medicine highlight the ways in which oral health and general health influence each other.

“It has become increasingly clear that the oral cavity is intimately tied to overall health,” says Dr. Hangorsky. “In this course, we summarize all the recent advances and highlight the relationship between different medical specialties and oral health.” Dr. Thomas Sollecito (D’89, GD’91), Chair and Professor of Oral Medicine and Eric Stoopler (D’99, GD’02), Associate Professor of Oral Medicine, who have appointments in Penn’s Perelman School of Medicine as well, also provide commentary in the course videos. Dr. Katherine France (D’16, GD’18), a current oral medicine resident, is teaching assistant for the course.

Each week’s session features an interview with a different Penn Medicine specialist. The topics covered include pain management, diabetes, cardiology, various skin conditions that also appear in the oral cavity, blood and bone marrow cancers, and certain kinds of head and neck cancer.

Hangorsky credits the ability to bring this course to fruition to Dr. Sollecito and Dr. Stoopler’s positions in the University of Pennsylvania Health System and close working relationship with many Penn Medicine specialists.

“It’s really a tribute to Penn Dental’s Oral Medicine Department that this course is even possible,” Hangorsky says. “We’re fortunate to be so well integrated into the Health System.”

The course developers see value in the material for a wide audience, from physicians, dentists, and other health care professionals to dental students, college students contemplating careers, or any individuals interested in learning more about the oral/systemic health connection. Coursera learners can take the courses, including exams and quizzes, for free, but must pay a fee if they wish to receive a certificate documenting their achievement.

The School’s first Coursera course, “Introduction to Dental Medicine,” remains popular and continues to be offered on a rolling basis.

“In the first course, we’ve been able to reach approximately 17,900 people in more than 100 countries,” says Dr. Hangorsky. “That’s more students than I’ve taught in my entire career.”

The Penn Dental Medicine Coursera courses are among the nearly 100 courses offered on Coursera by the University of Pennsylvania.

Paving a Path to Higher Education

This summer, through participation in Penn’s Summer Mentorship Program (SMP), Penn Dental Medicine once again welcomed 10 students from area high schools as they explored the career possibilities within dental medicine. Administered by the Division of the Vice Provost for University Life, the SMP aims to inspire first-generation and minority students to view higher education as an achievable goal. Participants in the four-week program choose among dentistry, medicine, law, engineering, and nursing for their SMP experience. Penn Dental Medicine has been participating in the SMP since its launch in 2006.

Dr. Beverley Crawford, Director of Diversity and Inclusion, oversees the SMP at Penn Dental Medicine and views it as a vital part of pipeline efforts to increase diversity within the dental profession. “Introducing students to the dental profession at a young age and setting their sights on an education that can be financially achievable are the first steps to growing this important part of the professional community,” notes Dr. Crawford.

A million-dollar fundraising challenge in partnership with Henry Schein, Inc. is presently underway to build support for diversity scholarships and pipeline/recruitment efforts. For information on supporting the program, contact Maren Gaughan, Associate Dean for Leadership Giving, gaughan@upenn.edu, 215-898-8952.

ABOVE: Summer Mentorship Program participants were introduced to dental instruments and the oral cavity in the simulation clinic.
What excited you most about Penn Dental today?
The renewal of the School's facilities as well as our world class faculty have allowed us to attract and enroll top students for the DMD, advanced dental education, and DScD programs. There is a real sense of energy in achievement and success here at Penn Dental that keeps me busy every day.

Schools/degrees?
PhD from University of Pennsylvania, EdM from Temple University, and BS from Columbia University

If you could have dinner with anyone who would it be? And why?
Jimmy and Rosalynn Carter, because I would like to hear their insights about their commitment to peace and social justice, especially in their work with the Carter Center since their time in the White House ended. I have read many of the Carters' books and have lots of practical questions and theoretical issues that I would love to discuss with them.

Hobbies?
Reading, dance, and exercise classes, and spending time with our grandchildren

Favorite vacation destination?
Ocean City NJ, and traveling to visit our six children who live throughout the world

Best book you've read recently?
"Teeth" by Mary Otto. Subtitled, “The story of beauty, inequality and the struggle for oral health in America,” this book clearly showcases the differential access to dental care based on socioeconomic factors. My wish is that this book will provoke a new level of understanding and activism in consumers and professionals alike to advocate for greater funding and equity in national and state oral health policy. If you haven’t read it, I recommend it highly!
LOOKING BACK, MOVING FORWARD

Q&A WITH DEAN DENIS KINANE
AS WE LOOK BACK ON HIS TENURE
SERVING AT THE HELM of Penn Dental Medicine since July 2009, Morton Amsterdam Dean Denis Kinane shared with the Penn Dental Medicine community this summer that he will be stepping down from the deanship at the end of December to pursue new professional opportunities. In this leadership transition, Dr. Dana Graves, Vice Dean for Scholarship and Research, will serve as Interim Dean, effective January 1 and until a successor for Dean Kinane has been appointed. As Dean Kinane moves on, he leaves Penn Dental Medicine strong and well-positioned for the future.

“It has been a tremendous honor and pleasure to serve this great institution and to work with the entire Penn Dental Medicine community and colleagues throughout Penn,” says Dean Kinane. Indeed, in collaboration with faculty, staff, students, and alumni there have been significant advances, focused on the shared goal of moving the School’s mission forward. On the pages that follow, we highlight some of the key initiatives implemented in the areas of education, research, and patient care since 2009.

As we look back over the time of Dean Kinane’s tenure, the Penn Dental Medicine Journal also asked him to share some thoughts on dentistry and dental education going forward.

What do you see as some top trends in dentistry now and into the future?
While all areas of dentistry are advancing in quite a dramatic fashion right now, one area that stands out and crosses multiple disciplines is the major impact of digital technology. Digital work flow and CAD CAM are changing the way we practice now and into the future — from enhanced case planning to advanced esthetics. In similar ways, cone beam computed tomography has been an immense breakthrough in the last 10 years; it too is used across specialties and I foresee it becoming even more ubiquitous with new advances.

In terms of clinical provision, I think access to care for underserved communities will continue to be a public health challenge. We will have to devise new ways and new personnel to deliver that care, and be supportive of innovative means of care provision.

What areas do you see impacting dental education going forward?
What we teach has to support current and future dental practice, and the Penn Dental curriculum does that. I think one area that cuts across education generally is the major change in the pedagogy. What we have been able to do here at Penn Dental Medicine is flip the classrooms and create videos of most of the lectures, so students can view and review them at their own pace. I imagine that live lectures will still be important into the future, but think people will accept that in many cases students will be able to look at the recorded media rather than the live performance. Incorporating this pedagogical philosophy into our new curriculum has had tangible results, and we are already seeing even more remarkable performances for our students on national examinations.

In addition, the whole explosion of digital media means students can share and access information more readily and this won’t stop after they graduate. Whether it is expert advice on diagnosis, treatment, or prevention, the exchange of information will be in real time. What will be very important in those scenarios is the ability to recognize quality, evidence-based resources — so critical thinking and discernment will become even more important, while the extent of information committed to memory may change. I think we will gradually accept that our ways of thinking in the future will be much more about asking the right questions, finding the best source of knowledge, and discerning quality; it will be much more interactive, with the knowledge that we have this reservoir of information out there that can help us with decisions. We will still need to know the basics, the vocabulary and what the information means, but essentially the extent to which our memories will be silicon or neurobiological will be the question.

As one looks to the future of dental research, are there any areas with particular potential for advancing patient care?
As a world community in dentistry, we have made major advances in caries and periodontal disease, but much less so in oral cancer, and I think we can do a lot in this area. Historically, dentistry in the U.S. has somehow given the lead in oral cancer to otolaryngology departments, but I foresee potential growth in an approach to oral cancer that is dentally led. Dentists are uniquely skilled to advance care in this area — whether it be in reconstruction, uncovering the etiology and pathogenesis of oral cancer, or in rehabilitating patients’ oral function and relief of pain following surgery, radiotherapy, and chemotherapy, particularly when the dentition and/or salivary glands are compromised.

In regard to your tenure as Dean, what single thing has been the highlight of this role?
That is a tough question, yet our stellar students stand out as one of the very best parts of this position in the sense of seeing them develop from undergraduates to skilled dentists and being part of their career development. Sharing in the School’s rich history with the 100th anniversary of the Evans Building and seeing it transformed for the next generation of students has also been tremendously rewarding. All in all, it has been a very change-driven time for the School and the faculty, staff, and students, indeed everyone, has been incredible in supporting that process. Our success has been through allowing the excellence of the Penn Dental community to exert itself and shine through. Together, we have made changes across the board in research, teaching, clinical provision, and service and have been able to do it in a fiscally efficient manner with unprecedented support from our alumni and major donors. I thank Penn for this extraordinary experience.
HONORS PROGRAMS
Designed to cultivate a leadership outlook in exceptional students who meet the academic requirements, the honors program was launched in 2010 in the areas of research, community health, and clinical dentistry, and has grown since then to include medically complex, radiological sciences, and oral and maxillofacial surgery honors as well. At the start of this 2017 academic year, there were 161 students pursuing one or more honors with their DMD.

INTERPROFESSIONAL LEARNING
Building on its interprofessional educational opportunities with other Penn schools, Penn Dental Medicine added a MS in Bioengineering to its dual-degree options in 2011 and continued to expand the offerings with a JD in Law and an MBA in 2012, and a MS in Translational Research and a Master of Law in 2014 — bringing the total to 8 dual-degree options.

ADVANCED SIMULATION
Virtual reality advanced simulation units employing haptic technology were added to preclinical instruction in 2014.

GLOBAL ENGAGEMENT
In 2010, Dr. Syngcuk Kim was named to the newly created post of Associate Dean for Global Affairs to help advance Penn Dental Medicine’s global engagement. That year, the school was among a delegation to Beijing led by Penn President Amy Gutmann, part of another she led to Seoul in 2011, and also participated in the Penn Wharton China Center opening in 2015. Since 2010, the School has signed 30 memorandums of understanding, including 22 in Asia, 3 in South America, and 5 in Europe.

LEARNING TECHNOLOGIES
A Learning Technologies Team was created in 2014 to integrate online resources into the curriculum — from recorded lectures/tutorials and online testing to gamification and course iBooks (currently there are 52 course iBooks). Since 2015, all DMD students receive iPads and are required to bring them to class as blended learning continues to transform the way courses are taught and students learn. Also since 2015, two Massive Open Online Courses have been developed through the online platform Coursera.

EXPANDED PEDIATRICS
In 2014, the pediatric residency program doubled the number of residents accepted each year to 4 and the clinic expanded as well with a new open bay, adding 6 chairs.
NEW CURRICULUM
A new curriculum was implemented with the start of the 2015 academic year for first-year students. It reflects an emphasis on the integration of scientific information; enhanced small-group, case-based learning; and more clinical rotations throughout the first two years. Major improvements in national exams are already being realized.

REIMAGINED LIBRARY
The reimagined library, part of the $37 million Evans Building Centennial Renaissance project that transformed all four levels of this historic structure, opened in March 2016, occupying space on the 2nd and 3rd floors. With a focus on digital resources, the main reading room on the 2nd floor is in the library’s original location when the building opened in 1915.

CHEUNG AUDITORIUM
The former B-60 in the lower concourse of the Evans Building — one of the most heavily used academic spaces in the School — underwent a complete renovation, opening in January 2017. With a leadership gift by Dr. William Cheung (D’81, GD’82) to make the renovation possible, alumni can still name a seat in the space at www.dental.upenn.edu/takeaseat.

SIMULATION CLINIC
The new preclinical simulation clinic, also part of the Evans Building Centennial Renaissance project, opened in August 2016 in the lower concourse of the Evans Building. The high-tech facility features 90 workstations, each outfitted with a simulation unit and a monitor for instructional videos and streaming of live demonstrations.

STUDENT-CENTERED LOWER CONCOURSE
Eight small group study rooms, 4 seminar rooms, a student lounge, and the Offices of Student Life and Academic Affairs are among the new spaces in the renovated lower concourse of the Evans Building, completed in January 2017. Part of the Evans Building Centennial Renaissance, it created an area fully devoted to student services and support.

NEW PROSTHODONTICS PROGRAM
In July 2017, a new advanced specialty program in prosthodontics welcomed its first class of residents.
RESEARCH

Some highlights of research-related initiatives advanced over the tenure of Morton Amsterdam Dean Denis Kinane.

FACULTY RECRUITMENT

Since 2009, the depth of the School’s research enterprise has been bolstered by a focus on recruiting research faculty across the basic and clinical sciences, including:

- **Dr. Claire Mitchell**
  Dept. of Anatomy & Cell Biology (in 2009)

- **Dr. Anh Le**
  Dept. of Oral & Maxillofacial Surgery/Pharmacology (in 2012)

- **Dr. Shuying (Sheri) Yang**
  Dept. of Anatomy & Cell Biology (in 2016)

- **Dr. Dana Graves**
  Dept. of Periodontics (in 2010); he was also named to the newly created post of Vice Dean for Research and Scholarship in 2013.

- **Dr. George Hajishengallis**
  Dept. of Microbiology (in 2012)

- **Dr. Henry Daniell**
  Dept. of Biochemistry (in 2013)

- **Dr. Hyun (Michel) Koo**
  Dept. of Orthodontics, Divs. of Community Oral Health & Pediatrics (in 2013)

- **Dr. Ricardo Teles**
  Dept. of Periodontics (in 2017)

- **Dr. Betty Hajishengallis**
  Div. of Pediatric Dentistry (in 2012)

- **Dr. Rabie Shanti**
  Dept. of Oral & Maxillofacial Surgery (in 2016)

- **Dr. Songtao Shi**
  Dept. of Anatomy & Cell Biology (in 2014)

- **Dr. Flavia Teles**
  Dept. of Microbiology (in 2017)

SCHOLARSHIP

The number of fully published articles by the School’s full-time, standing faculty increased from a total of 62 articles in 2009 to a total of 160 in 2016.

DSCD PROGRAM

With the goal of preparing students for a research-focused academic career, the School launched a DScD program in 2011. Presently, there are 15 students in the program; a major success in “growing” new faculty, 3 recent DScD graduates (all women) have joined the School’s faculty.

PATENTS

Since 2012, 21 provisional patents were filed by Penn Dental Medicine faculty and 13 US patents issued.
AADR TRAVEL AWARDS
This new initiative to build opportunities for students and junior researchers to present their research on a national/international stage launched in 2014, sending students/junior researchers to the annual AADR meeting each year since.

RESEARCH SYMPOSIA
The School brought together leading researchers and clinicians, hosting 13 major research and clinical symposia at Penn since 2012, including:

• Penn Esthetics Symposium (2012 and 2015)
• 5th International Congress of Adhesive Dentistry (2013)
• Penn Periodontal Conference (2013, 2015 and 2017 [see 2017 highlights, page 38])
• ARONJ: An Update (2014)
• Endodontic Retreat: Surgical and Non-Surgical Management (2014)
• World of Oral Medicine (2015)
• TMJ A to Z (2015)
• Penn Week of Orthodontics (2016)
• Just Bond It! (2017, see highlights, page 40)
• Penn Stem Cell and Regenerative Dentistry Conference (2017, see highlights, page 44)

NEW MSOB TRACK
An evidence-based learning track for the Master of Science in Oral Biology (MSOB) was introduced in 2015, providing a non-laboratory-based research option for earning a MSOB.

PENN CHINA RESEARCH & ENGAGEMENT FUND (CREF) AWARD
Penn Dental Medicine was among the inaugural recipients of a CREF grant from Penn in 2015 to support three high-level research symposia and a conference on the delivery of dental care in China at Penn Wharton China Center in Beijing. The first symposium, on the topic of bone biology, was held in 2016, and second, on biofilm, took place in September 2017 (see page 5).

RESEARCH DAY LAUNCHED
In 2016, Research Day launched to bring together the School community annually to spotlight both faculty and student research in one event (see highlights of Research Day 2017, page 37).
PREVENTIVE CARE PROGRAM
In 2009, the Div. of Community Oral Health piloted its first dental sealant program with one West Philadelphia school, and today has expanded to provide educational and preventive care services to complement the comprehensive dental care provided on the PennSmiles bus to serve 14,000 children in 24 schools this past year.

CENTRAL PATIENT REGISTRATION
Streamlining patient management, a central patient registration area was created in 2010.

GOING DIGITAL
Digital radiography was introduced within the School’s clinics in 2010, the same year the School’s CAD/CAM Ceramic Center expanded to accommodate a growing inventory of state-of the-art equipment. Soon after, patient records became fully electronic; and now all DMD students gain experience using intraoral scanners as the School continues toward complete digital work flow.

LIFE CENTER
In collaboration with Penn’s School of Nursing, Penn Dental Medicine opened a dental clinic at the LIFE Center in 2011, serving the needs of geriatric patients and expanding students’ clinical experiences with elder, medically complex individuals. Third- and fourth-year students rotate through the clinic.

ADVANCED DENTAL CARE CLINIC
Designed to manage advanced cases in restorative and esthetic dentistry, the William W. M. Cheung Advanced Dental Care Clinic opened in 2010. This new 15-chair clinic has been the home of the DMD clinical honors program since its opening, and since July 2017, residents in the new prosthodontics program also see patients here.

SAYRE HEALTH CENTER CLINIC
The School opened a clinic within Penn Medicine’s Sayre Health Clinic in 2011, providing comprehensive dental care alongside doctors and nurses in this West Philadelphia clinic. Second-, third- and fourth-year students rotate through the clinic.
SYNGCUK KIM ENDODONTIC CLINIC
With the opening of this new clinic in 2013, the School opened the doors to one of the most high-tech clinical settings for endodontic instruction and patient care.

EDWARD & SHIRLEY SHILS CLINIC
Part of the Evans Building Centennial Renaissance project, the Edward & Shirley Shils Clinic opened in September 2016. This new 57-chair general restorative teaching clinic is situated in the southwest section of the first floor of the Evans Building.

ORTHO CLINIC EXPANSION
Completed in June 2017 with alumni support of the Penn Ortho Centennial Campaign, a reconfiguration of the clinic space added four new treatment areas. Other changes included the remodeling of the waiting area and improved digital capabilities.

MAIN CLINIC RENOVATION & SCHATTNER PAVILION
Made possible by a $15M gift from the late Dr. Robert Schattner (D’48), the School’s Main Clinic (to become the Robert I. Schattner Clinic) is undergoing a complete renovation for an improved patient and student experience; the transformed space will be completed by the close of December 2017. And with a projected completion date of June 2018, the Schattner Pavilion will enhance the connection of all three buildings that make up Penn Dental Medicine, facilitating interaction of faculty and staff as well as patients and visitors.

PENNSMILES
In 2013, the PennSmiles mobile dental vehicle marked 10 years of bringing comprehensive dental care to children in West and Southwest Philadelphia, and the program expanded with a second bus this fall (see story, page 3). Presently, the PennSmiles program works with 24 schools within approximately 24-square-miles of Penn.

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ORAL AND MAXILLOFACIAL surgeons, by the very nature of their specialty, often work with colleagues across many disciplines to achieve optimal outcomes for patients. Think about it — a patient being treated for a tumor in her jaw might require a team that includes radiation and medical oncologists, pathologists, oral medicine specialists, prosthodontists, endodontists, speech therapists, dieticians and social workers, just to name some of those who may be involved in this patient’s care.

The importance of this interdisciplinary, collaborative approach is evident in the Department of Oral & Maxillofacial Surgery/Pharmacology at Penn Dental Medicine, where many faculty members have both dental and medical degrees and hold joint appointments at Penn Dental Medicine and Penn Medicine to further facilitate a high level of interaction with other specialists. In fact, this year marks a milestone exemplary of these interprofessional ties: the 25th year of establishing a Department of Oral & Maxillofacial Surgery at the Hospital of the University of Pennsylvania (HUP) (see sidebar, p. 19).

Now, under the leadership of Chair Dr. Anh Le, Norman Vine Endowed Professor of Oral Rehabilitation, the School’s Department of Oral & Maxillofacial/Pharmacology is carrying out an ambitious plan to incorporate the latest research, technology, and integrated initiatives in academics, research, and clinical care, Dr. Le says, “expanding each component to elevate and grow the department and to provide a world-class clinical experience to our patients at Penn.”

On the clinical side, one major way Dr. Le is fostering this approach is through the development of “centers” or clusters of patient
INNOVATIVE TECHNOLOGY TO AID SURGICAL PRECISION

These clinical efforts are further supported by a departmental focus on utilizing the most advanced technology available, including state-of-the-art 3D printing and digital scanning and incorporating digital tools to exactly plan and carry out these complex surgical procedures with the greatest degree of precision and efficiency. In collaboration with several Penn Medicine departments, Dr. Le notes that they hope to bring 3D printing and digital scanning capabilities on site in 2018; presently, while these technologies are used in patient care within the department, the 3D printing and scanning are contracted with an external lab.

By using virtual surgery planning, Dr. Shanti says, “I can get on a computer with images of the patient, design the surgery, simulate it, and identify where I’m going to make the cuts, how the tumor is going to come out, and how I’m going to rebuild the jaw.” This technology allows for the fabrication of customized materials — cutting guides and plates specific to each patient. “It not only helps increase the precision and accuracy of the surgery,” he says, “but it also minimizes the time we spend in the operating room.”

One recent patient was a 59-year-old with an ameloblastoma that involved three quarters of her upper jaw and her entire hard palate, as well as the sinuses and inner nose. “Removing large tumors of the maxilla and palate requires consideration of the nose, eye socket, sinuses, and the skull base,” Dr. Shanti says. “Therefore, this technology allows me to consider every millimeter of the surgery in preparing for where I am going to make my bony cuts in order to remove the tumor safely and without compromising clearance of the tumor.”
During the same operation, the patient had her upper jaw defect reconstructed with bone, muscle, and skin tissue from her forearm. Within a week, she had left the hospital, was eating fairly normally, and moving toward having a denture fabricated with the long-term goal of having dental implants.

Although relatively rare — only one case in two million people — ameloblastomas are the most common benign tumors of the jaw and Dr. Shanti sees a significant number of cases. “We know very little about this tumor,” he says.

Thus, developing better options to treat the destruction caused by these benign tumors, which don’t respond to chemotherapy and often require major surgery to remove and rebuild the jaw, is of particular interest to him. And in the Oral and Maxillofacial Surgery lab, Dr. Shanti is working to better understand what drives ameloblastomas. His long-term goal is to develop non-surgical treatment options and to design new structures through tissue engineering that will more effectively replace the tissues his patients lose during surgery, whether due to tumors, trauma, or other medical conditions. He’s aiming to find a better option — for instance, by helping patients regrow their own tissue rather than harvesting part of a patient’s own body for reconstruction.

“I think we’re on the cusp with tissue engineering and using engineered stem cell-based constructs to reconstruct tissues of the head and neck,” he says. “I think that’s going to be a really significant advancement in reconstructive surgery that I hope to be a part of.”

Dr. Shanti, assistant professor at both Penn Dental Medicine and the Department of Otorhinolaryngology/Head and Neck Surgery at Penn Medicine, has brought deep interdisciplinary expertise to Penn. He attended dental school at Harvard University, spending two years as a Howard Hughes Medical Institute research scholar working in an orthopedics laboratory at the NIH’s National Institute for Arthritis and Musculoskeletal and Skin Diseases, where he focused on tissue engineering and designing new materials to regrow muscle and bone.

He then pursued his MD and residency in oral and maxillofacial surgery at Rutgers University, followed by a two-year fellowship at Louisiana State University, where he gained considerable experience in microvascular reconstruction surgery — taking tissues and blood vessels from one part of the body and connecting them as living tissue in another part of the body. The opportunity to work in a comprehensive and collaborative clinical and research environment that is patient-focused brought him to Penn in 2016.

“There is no area of medicine as multi-disciplinary as caring for a patient with oral cancer,” Dr. Shanti says. “In one patient, 15 specialists can be involved, and we go over each case together,” he notes. “For a patient with oral cancer, the diagnosis is already overwhelming, and we provide a patient-centered rather than practitioner-centered approach.”
Co-leading this new center is Dr. Chang, associate professor and Director of Maxillofacial Prosthodontics, who has joint appointments in both the Dept. of Oral & Maxillofacial Surgery/Pharmacology and Dept. of Preventive and Restorative Sciences at Penn Dental Medicine. He also holds an appointment at Penn Medicine.

Since coming to Penn earlier this year, Dr. Chang has been teaching in Penn Dental Medicine’s new residency program in prosthodontics and sees patients at the Clinical Practice of the University of Pennsylvania Dept. of Oral & Maxillofacial Surgery at HUP.

Spanning these roles, his responsibilities include the care of medically compromised patients who need prosthetic reconstruction due to disease or trauma, organization of the maxillofacial prosthodontic clinic, resident education, and research. He also consults as part of the head and neck cancer team and works with colleagues across a variety of medical and dental specialties.

Prior to joining Penn, Dr. Chang was head of the Section of Maxillofacial Prosthodontics at the Cleveland Clinic and director of predoctoral prosthodontics at Harvard’s School of Dental Medicine. He did a residency in prosthodontics at Northwestern University and a fellowship in maxillofacial prosthodontics at Columbia University.

His research interests include the clinical outcomes of dental implants for head and neck cancer patients and the application of novel 3D technologies for surgical and prosthetic reconstruction for patients with head or neck cancer or craniofacial anomalies. He also has a particular interest in curriculum development.

“Research of head and neck cancer and craniofacial anomalies has been rapidly growing through the interactions between clinician-oncologists, basic scientists, speech and language pathologists and engineers,” Dr. Chang says. “I have also been working on outcome assessments of quality of life and physiologic functions, such as speech, deglutition, and swallowing, for patients with head and neck cancer or craniofacial anomalies.”

This year marks a milestone exemplary of the interprofessional ties of the School’s Department of Oral & Maxillofacial Surgery/Pharmacology — the 25th anniversary of establishing a Department of Oral and Maxillofacial Surgery at the Hospital of the University of Pennsylvania (HUP).

In 1992, Dr. Peter Quinn, then Chair of Penn Dental Medicine’s Department of Oral and Maxillofacial Surgery/Pharmacology, was also named Chair of the newly created Department of Oral and Maxillofacial Surgery and Hospital Dentistry at HUP. This independent departmental status facilitated the growth and integration of the oral and maxillofacial surgery and oral medicine faculty across Penn Medicine.

It paved the way for an “ambitious renovation and expansion of the program,” Dr. Quinn says, further shoring its reputation as a “premier program for education, research, and patient care.” Dr. Quinn, who remained Chair of the department until 2008, is presently Schoenleber Professor of Oral & Maxillofacial Surgery/Pharmacology; Vice Dean for Professional Services, Perelman School of Medicine; and Senior Vice President for the University of Pennsylvania Health System.

Growth was evident with the number of full-time Department faculty increasing from four in 1994 to 15 today. The Department at HUP was located within the hospital’s White Building until 2012, when it moved to its current home within the Perelman Center for Advanced Medicine.

establishing the department at HUP reflected a general trend of addressing more complex medical cases in a hospital setting, facilitating collaboration with other specialists. “We are a very interprofessional group,” Dr. Quinn says of oral surgeons. “Most of us have medical and dental degrees; we straddle two professions and have always had a presence in both the dental school and hospital.”

A highlight during this time was Dr. Quinn’s work on the Zimmer-Biomet Temporomandibular Joint (TMJ) Replacement System, which received FDA clearance in 2005 and is still the only FDA-approved stock prosthesis in the U.S. “It took six years to develop, followed by a 10-year clinical trial,” he says. “You need to be in a place like Penn, that can draw enough patients to power the study and has the research infrastructure” to bring about such advances.

Now, with the help of computer-guided surgery and 3D-printing technology Dr. Quinn expects more opportunity to create custom TMJ prostheses for patients.

But, he predicts that future advances in the field are likely to come from the innovative research being done in the Department today under the leadership of the current Chair, Dr. Anh Le. “There has been an explosion both in basic science and on the translational side in the last 25 years,” Dr. Quinn says. Rather than looking at ways to make better prostheses, he says, leading-edge research is focused on engineering a patient’s own tissue to genetically replace what they lose. “That’s the next frontier,” he says.
NEW RESEARCH-FOCUSED RESIDENCY OPTION

In addition to establishing these clinical centers of expertise, the department also recently received approval to expand the department’s residency program, directed by Dr. Helen Giannakopoulos, Associate Professor (above, left). There are currently three residents per year in the six-year, dual-degree Oral and Maxillofacial Surgery/MD program, who receive a medical degree from Penn Medicine, a two-year certificate in general surgery and certificate in oral and maxillofacial surgery. Starting next year, a fourth resident will be added along with the option for residents to additionally pursue a Doctor of Science degree, taking about two years longer to complete this research-focused degree. The intention Dr. Le says, “is to teach future generations of surgeons who can integrate more evidence-based, innovative scientific findings into their practice.”

“The intention is to teach future generations of surgeons who can integrate more evidence-based, innovative scientific findings into their practice.” — DR. ANH LE

In the realm of research, among the areas of particular focus within the department is regenerative medicine. Since coming to Penn Dental Medicine in 2012 from the University of Southern California’s Ostrow School of Dentistry, Dr. Le has continued her research on mesenchymal stem cells from adult oral gingival tissues (also known as GMSC), and how they might aid in wound healing and regenerating of lost tissues from either trauma or pathologies. She is also studying their potential for use in nerve and tissue regeneration, which could help, for instance, a patient who has had partial tongue removal due to cancer or injury.

“The Oral and Maxillofacial Surgery lab is focused on translational/clinical research in regenerative medicine of the orofacial structure. An active project is to develop a neural construct using GMSCs, looking at nerve regeneration, nerve injury pathology, trauma, and tumor resection,” says Dr. Le. Although she says clinical human trials are at least a decade away, this research holds promise for head and neck cancer patients in need of reconstructive surgery following tumor resection with resulting nerve injury.

These promising areas of research, along with new initiatives in education and clinical care, are all intended to support the department’s overarching goal, Dr. Le says, of providing a “comprehensive and integrated approach to delivering the highest quality and personalized care to patients.”

— By Debbie Goldberg
Cone Beam Computed Tomography: A Paradigm Shift in Dental Imaging

A CURSORY GLANCE of the literature in PubMed will reveal just over 4,000 articles that are directly or indirectly connected to cone beam computed tomography (CBCT). Witnessing the birth and ascent of CBCT and its adaptation in the practice of Oral & Maxillofacial Radiology was exciting. In 1998, an article published by Mozzo and co-workers1 in the journal *European Radiology* laid the foundation for the new revolution in 3D imaging, as the authors explained how this volumetric CT machine would be useful for dental imaging. For decades, dentistry depended upon a flattened 2D image with no depth. CBCT, a low-dose, high resolution digital imaging technology provided the imaging for the other two planes. True to the article, CBCT became very relevant; a third dimension is often needed for diagnosis.

CBCT imaging can be utilized in all aspects of dental care for precise treatment planning and better prognosis for our patients. This is especially true in specialties like periodontics, endodontics, pedodontics and orthodontics. Oral and maxillofacial surgeons, prosthodontists, and oral medicine specialists traditionally used multi-detector CT (MDCT) or multi-slice CT (MSCT) as they needed technology that would show soft tissue enhancement and be covered under medical insurances. The introduction of the CBCT added significant value to their treatment planning because of its lower dose of radiation.

CBCT is a new standard for pre-implant imaging and treatment planning for implants, including the engineering of surgical stents, which aid in implant placement2. Designing can be completed digitally using the CBCT volume (dicom file format) with a proprietary software and can be saved into special file formats (.stl) that can be used for 3D printing and laboratory manufacturing of surgical stents. The same technology can be utilized for printing stereolithographic models that are used in orthognathic or tumor-related mock jaw surgeries. Large CBCT Fields of View (FOV) are acquired with resolutions ranging from 200-400 µmeters (microns). In specialties like endodontics or periodontics, small volume CBCT imaging using pixel sizes as small as 60-70 µmeters can be utilized to view PDL space, furcation defects, root anatomy, fractures, and complex pulp pathways that would otherwise be hard to assess using 2D imaging alone. Children and adolescents need a CT with lowered dose, and therefore, CBCT would be their choice of imaging modality. The FOVs can be tailored to suit the imaging needs in pedodontics, simultaneously reducing the effective doses [E] (table 1), as collectively, we have an obligation to our patients to reduce the dose as low as reasonably achievable (ALARA)3.

(continued on page 35)
ANATOMY & CELL BIOLOGY

SELECTED PUBLICATIONS
A selection of recently published work by department researchers (indicated in bold).


STEM CELL CONFERENCE
The Dept. of Anatomy & Cell Biology in collaboration with the Dept. of Endodontics organized the Penn Stem Cell & Regenerative Dentistry Conference, Oct. 20-21, 2017 (see story, page 44).

BIOCHEMISTRY

SELECTED PUBLICATIONS
A selection of recently published work by department researchers (indicated in bold).


RECENT GRANT AWARDS
Oral Tolerance for Hemophilia

The current standard of care for the X-linked bleeding disorder hemophilia is intravenous infusion of recombinant factor VIII (FVIII, for hemophilia A). FVIII is expensive, requires frequent repeated IV injections, and is often targeted by antibody responses, thereby complicating/neutralizing therapy, creating immunotoxocities, and further increasing costs. The goals of this project are to: 1) Develop the next generation of edible transplastomic plants expressing FVIII antigen, ovalbumin, or IL-10 fused to different transmucosal carriers, using cutting-edge chloroplast genetic engineering tools. 2) Continue to define the mechanism of oral tolerance induction/immune regulation, in part through use of a model antigen. 3) Suppress inhibitor formation against FVIII in hemophilia A dogs and develop combination oral immune modulatory therapies.

Funding Source: University of Florida, NIH Principal Investigator: Dr. Henry Daniell, Professor

ENDODONTICS

NEWS/ACHIEVEMENTS
Dr. Bekir Karabucak, Chair, was one of six faculty invited from the U.S., United Kingdom, and South Africa to Kuwait University Dental School in May to evaluate the dental education and administer mid-term and final exams to dental students.

The Penn Endo Global Symposium was held in Guadalajara, Mexico, Oct. 26-28, and there will be one in Jeddah, Saudi Arabia, March 25-28, 2018 and in Buenos Aires, Argentina, May 24-26, 2018.

SELECTED PUBLICATIONS
A selection of recently published work by department researchers (indicated in bold).


MICROBIOLOGY

NEWS/ACHIEVEMENTS
Dr. Flavia Teles has joined the Dept. of Microbiology as an Associate Professor; her appointment was effective August 15, coming to Penn Dental Medicine from the University of North Carolina School of Dentistry. Her research interests focus on building a better understanding of how microorganisms contribute to the pathogenesis of periodontal diseases and the effects of periodontal treatments on the local microbiome.

Tetsuhiro Kajikawa, from the lab of Dr. George Hajishengallis, won a research award in the 10th International Workshop on Complement Therapeutics, held in Greece in June, for his poster presentation “Complement and Periodontitis: The Role of the Classical Pathway.”

(continued after the survey on page 23)
Alumni Communications & Engagement Survey
Making Connections:
WE WANT TO HEAR FROM YOU
Thank You for Your Feedback

Please take a few minutes now to complete our alumni communications and engagement survey on the adjoining page. Simply tear it from the fold of the magazine and return in the postage-paid envelope enclosed. You’ll have the chance to win a set of personalized Penn Dental Medicine scrubs for taking the time to send us your feedback — be sure to include your name and full address when completing the survey to be eligible for that drawing.

We look forward to hearing from you.

TO COMPLETE THE SURVEY ONLINE, VISIT WWW.DENTAL.UPENN.EDU/SURVEY

We want to hear from you on an ongoing basis — contact us at alumni@dental.upenn.edu or 215-898-8951.

RESOURCES TO STAY & GET CONNECTED

Are you looking for a former classmate? Do you want to get your practice in front of potential patients? Do you need to hire a new associate? Want to keep up with news for the school? Remember there are a number of easy online resources to help you get connected.

| QUAKER NET | FIND A PENN DENTIST |
| QuakerNet is Penn’s secured alumni directory, where you can keep your contact information current as well as search for fellow classmates and peers. Visit www.myquakernet.com/dental. | Find a Penn Dentist, located prominently on the Penn Dental Medicine web site, allows visitors to the site to search a directory of Penn Dental Medicine alumni practices by city/ state, zip code, or specialty. Register at www.dental.upenn.edu/map. |

| CAREERS | SOCIAL MEDIA |
| Career Opportunities is an online resource for those beginning a job search and a place to submit a posting if you are seeking a new employee or looking to sell your practice. Visit www.dental.upenn.edu/careers. | Join “Penn Dental Medicine” on Facebook or follow “PennDentalMed” on Twitter and Instagram. You can also connect to “Penn Dental Medicine Alumni” on LinkedIn (a private group of alumni and current students). |
We are asking for just a few moments of your time to complete the brief survey below. Your feedback will help us communicate news and information that is of interest to you in a format that best suits your lifestyle and preferences.

If you prefer, you can also complete this survey online at www.dental.upenn.edu/survey

Responses received by January 1, 2018 will be eligible to win personalized Penn Dental Medicine scrubs. To be eligible for the drawing, please include your name, address, email, and phone number below. Responses to the survey will be kept confidential.

Name __________________________________________  Phone#__________________________

Address __________________________________________________________________________

Email ______________________________________________________________________________

1. What is your relationship to Penn Dental Medicine?  Alumni – graduation year(s)_____________________________________________________

Other (please specify) ________________________________________________________________________________________________________

2. What is your age?  □ Under 25  □ 25 to 34  □ 35 to 49  □ 50 to 64  □ 65 and over

3. How often do you read the Penn Dental Medicine Journal?  □ Every issue  □ Most issues  □ Some issues  □ Not at all

4. Would you prefer to receive the Penn Dental Medicine Journal...

□ In print  □ Digital version  □ check here to be taken off the mailing list for the print version  □ Both

Comments _________________________________________________________________________________________________________________

5. Please rate your interest in the following content topics within the Penn Dental Medicine Journal:

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<th>Not interested</th>
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What other topics are of interest to you

6. Please indicate your agreement with this statement: “The Penn Dental Medicine Journal strengthens my connection to the dental school.”

□ Strongly Agree  □ Agree  □ Disagree  □ Strongly Disagree  □ No Opinion

7. The electronic alumni newsletter, News@PennDental, was launched earlier this year as an additional means of sharing news from the School. Do you recall receiving it?  □ Yes  □ No  Comments__________________________

If you have not received the newsletter or would like to correct/confirm your preferred email, please do so here: ____________________________

Continued on reverse side >
Communications & Engagement Survey continued

8. Please comment on the frequency of Penn Dental Medicine’s communication with you:
   □ Not enough  □ Just enough  □ Too much  Comments _______________________________________________________________________

9. How else are you involved with Penn Dental Medicine (check all that apply)?
   □ Attended a recent event  □ Made a donation to the School  □ Recommended the School to a potential student or family member
   □ Volunteered for an activity/program at the School  □ Other__________________________

10. There are a variety of ways to become engaged with Penn Dental Medicine – please check those that are of most interest to you:
    □ Teaching opportunities  □ Mentoring opportunities  □ Interviewing opportunities  □ Presenting a continuing education program
    □ Serving on a volunteer committee  □ Helping organize a class reunion activity  □ Other________________________________________
    □ If you have provided your name and contact information, please check here if you would like to be contacted about the opportunities you selected.

11. What kind of CE programs from Penn Dental Medicine interest you? (check all that apply and rate interest)
    Online  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Lecture/Presentation  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Hands-on courses  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Comments ________________________________________________________________________________

12. When do you prefer to attend CE courses?  □ Weekend CE course  □ Evening CE course  □ Multi-day programs/Symposia
    Comments ________________________________________________________________________________

13. Rate your interest in the following CE program topics:
    Restorative/Prosthodontics  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    CAD/CAM  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Implants  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Periodontics  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Endodontics  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Orthodontics  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Oral & Maxillofacial Surgery  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Oral Medicine  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Oral Pathology  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Basic Sciences  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Practice management  □ Interested  □ Somewhat interested  □ Not interested  □ No opinion
    Other ___________________________________________________________________________________________

If you have any additional feedback regarding the School’s communications or alumni engagement opportunities, please share here:

______________________________________________________________________________________________________

Thank you for participating in our survey. A postage-paid envelope is included in the fold of the magazine for your convenience. We welcome your feedback on an ongoing basis; please do not hesitate to send us comments or suggestions anytime and on any topic to alumni@dental.upenn.edu.
BONE MARROW STEM CELLS

Work from the lab of Dr. George Hajishengallis found a protein that helps bone marrow stem cells spring into action to make new blood cells. The protein, Del-1, plays a role following bone marrow transplantations, making it a potential target for improving those procedures. See following publication:


SELECTED PUBLICATIONS

A selection of recently published work by department researchers (indicated in bold).


RECENT GRANT AWARDS

Advanced Design of Tumor Targeted, Neutralization Resistant oHSV Vectors

This study will focus on targeting metastatic cancer tumors with a new weapon: herpes. Viruses have been used to treat tumors before by causing the body to attack foreign invaders, but these viruses can fall short when the body creates antibodies to destroy the virus. Dr. Gary Cohen and a colleague from the University of Pittsburgh will work to create a breakthrough herpes virus that specifically targets tumors and is highly-resistant to antibodies. This would help treat patients’ tumors more effectively and safely than existing treatments.

Funding Source: Spirit Award, NIH
Principal Investigator: Dr. Gary Cohen, Professor

Development of a Novel Antiviral to Treat/Prevent Acyclovir Resistance in Human Ocular Herpes Keratitis

The goal of this Phase I STTR is to initiate the development of an antiviral drug that can be used alone or in combination with ACV in order to diminish the chances of generating viral resistant mutants in recurrent treatment of human ocular herpes keratitis. Dr. Robert Ricciardi’s lab has discovered a potent lead that blocks HSV-1 infection and his studies on FHV-1 also provide a foundation to potentially use the feline natural model for a future SBIR Phase II study.

Funding Source: Fox Chase Chemical Diversity Center, NIH
Principal Investigator: Dr. Robert Ricciardi, Professor and Chair

A NEW MODEL OF REGENERATIVE WOUND HEALING VIA INFLAMMATION-MODULATING BIOMATERIAL

The potential to regain bone and attachment via drug modulation of a regenerative response would represent an ideal advance in periodontal therapy. This study will test the hypothesis that modulating the HIF-1α environment via an injectable HIF-1α agonist drug/hydrogel construct can lead to significant bone regeneration. This will be tested in the context of bacterially-induced, immune-mediated periodontal disease in mice, a validated model of human periodontal disease.

Funding Source: Lankenau Institute for Medical Research, NIH
Principal Investigator: Dr. George Hajishengallis, Professor

ORAL MEDICINE

NEWS/ACHIEVEMENTS

Dr. Eric Stoopler (D’99, GD’02), Associate Professor of Oral Medicine, received the Basic Science Award from the Penn Dental Medicine Class of 2017 — presented for excellence in teaching within the basic sciences.

SELECTED PUBLICATIONS

A selection of recently published work by department researchers (indicated in bold).


Oral Surgery/Pharmacology

NEWS/Achievements

Dr. Brian Ford (D’09, M’12, GD’15), Instructor, received the Earle Bank Hoyt Award from the Penn Dental Medicine Class of 2017 — presented for excellence in teaching to a faculty member who is a Penn Dental Medicine graduate. He and Dr. Neeraj Panchal were also the 2017 recipients of the Dr. Joseph W. Foote Mentoring Award for their work in mentoring residents.

Dr. Rabie Shanti and Dr. Steven Wang (D’09, M’12, GD’15) were recipients of the 2017 Dr. John W. Mooney Teaching Award.

As part of the resident graduation dinner in June, the Department marked the 25th anniversary of its Department at the Hospital of the University of Pennsylvania (see related story, page 19)

Selected Publications

A selection of recently published work by department researchers (indicated in bold).


Dr. Chun-Hsi Chung (D’86, GD’92), Chauncey M. F. Egel Endowed Chair, is now President of the American Board of Orthodontics. His installation was held in conjunction with the 2017 Annual Session of the AAO.

The renovations and additions to the Brainerd F. Swain Orthodontic Clinic were completed in June; the changes include four new treatment operatories, a remodeled waiting area, and improved digital capabilities.

Dr. Nipul K. Tanna (D’90, GD’10, MS’11), was named Director of the Postdoctoral Periodontics/Orthodontics Program. Dr. Tanna has been a member of the faculty since 1992 and a Clinical Assistant Professor of Orthodontics since 2013. He received his postdoctoral training at Penn Dental Medicine in the Orthodontics/Periodontics program in 2010 and is Board Certified in both specialties.

Recent Grant Awards

A double-blind, cross-over, incomplete factorial study to assess the local anesthetic efficacy and safety of CTT-5339 Anesthetic Spray (CTT-5339A), Stage 2: Double-blind Active Comparator Phase

The purpose of this study is to see if one spray of CTT5339-A to the gums above the top front teeth produces longer numbness or better numbness than one spray of benzocaine alone.

Funding Source: Cetlyte Principal Investigator: Dr. Elliot Hersh, Professor

Selected Publications

A selection of recently published work by department researchers (indicated in bold).


News/Achievements

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Funding Source: Cetlyte

Principal Investigator: Dr. Elliot Hersh, Professor

Selected Publications

A selection of recently published work by department researchers (indicated in bold).


Note: K Hoo has joint appointments in Div. of Pediatric Dentistry and Div. of Community Oral Health

YEAST-BACTERIA INTERACTION

A recent study from the lab of Dr. Hyun Koo has shown that blocking yeast-bacteria interaction may point to a therapeutic strategy for early childhood caries. See following publication:


PERIODONTOLOGY

SELECTED PUBLICATIONS

A selection of recently published work by department researchers (indicated in bold).


RECENT GRANT AWARDS

Bacteria and Lymphocyte Suppression in Periodontitis

The goal of the study is to determine the underlying mechanism by which a bacterial derived toxin, the cytolethal distending toxin (Cdt), acts to inhibit cell growth and induce cell death and thereby perturb host defenses. These studies will lead to a more detailed understanding of the toxin and provide: (1) important insight into the pathogenesis of disease caused by Cdt-producing bacteria and (2) a rationale on which therapeutic intervention may be developed to prevent or limit disease.

Funding Source: NIH
Principal Investigator: Dr. Bruce Shenker, Professor

PATHOLOGY

SELECTED PUBLICATIONS

A selection of recently published work by department researchers (indicated in bold).

Diabetes & Oral Microbiome

A study from the lab of Dr. Dana Graves has shown that the oral microbiome is affected by diabetes, and the change was associated with increased inflammation and bone loss. See the following publication:


**RECENT GRANT AWARDS**

**The role of NF-kB in Mesenchymal Stem Cells during Diabetic Wound Healing**
This study will investigate how diabetes affects mesenchymal stem cells that are important for hard and soft tissue healing. It will test if diabetes activates an inflammatory protein, NF-kB, and mediates the negative effects in these stem cells. The studies may provide a novel therapeutic approach to target this protein to improve the function of the stem cells in the treatment of non-healing diabetic wounds.

**Funding Source:** NIH

**Principal Investigator:** Dr. Kang Ko, DScD candidate

**SELECTED PUBLICATIONS**

**Blatz MB. AAD Honorary Members.**


**Division of Community Oral Health**

**RECENT NEW GRANT AWARDS**

**Expanding Pediatric Training in Predoctoral Dental Education**
This project builds on existing efforts at Penn Dental Medicine to expand predoctoral education in both pediatric dentistry and community health to address persistent health disparities and difficulties in accessing oral health care in the medically underserved communities in West Philadelphia. The overall goal is to expand the knowledge, skills, and experiences of students in providing dental care with children birth to age 5.

**Funding Source:** Health Resources and Services Administration, NIH

**Principal Investigator:** Dr. Joan Gluch, Professor and Div. Chief

**NEWS/ACHIEVEMENTS**

**Dr. Markus Blatz,** Professor and Chair, Dept.of Preventive & Restorative Sciences, has been recognized for his leadership in esthetic dentistry by both the American Academy of Esthetic Dentistry (AAED) and the European Academy of Esthetic Dentistry (EAED). Dr. Blatz was among those clinicians and educators inducted as a 2017 associate member of the AAED. And, he was honored by the EAED as the John McLean Honorary Speaker for 2017. The EAED awards this honor once a year to an internationally acclaimed leader in memory of Dr. John McLean, considered the father of modern ceramics and glass-ionomer cement.

**Dr. Joy Bockstein Abt (D’94),** Clinical Assistant Professor of Restorative Dentistry, received The Robert E. DeRevere Award from the Penn Dental Medicine Class of 2017 — presented for excellence in preclinical teaching by a part-time faculty member.

**Marianne Contino,** a dental hygienist instructor in the predoctoral clinic, received the Joseph L. T. Appleton Award from the Penn Dental Medicine Class of 2017 — presented to a part-time faculty/staff member for excellence in clinical teaching.

**Art Kofman,** C.D.T. Quality Control Coordinator and the Office of Laboratory Affairs Supervisor, received the Senior Outstanding Teaching Award from the Penn Dental Medicine Class of 2017 — presented to a faculty/staff member who has gone beyond the scope of his/her responsibilities to significantly impact the class’s education.

**PREVENTIVE & RESTORATIVE SCIENCES**

**LIBRARY**

**Librarian Pat Heller Retires**
After nearly 28 years of services as the Penn Dental School Librarian, Pat Heller retired in August 2017. Throughout her time with the School, students, staff, faculty, and alumni benefited greatly from her research skills and knowledge and the Penn Dental Medicine community wishes her all the best in her well-deserved retirement.

**CORRECTION:**
In the Spring 2017 issue of the Penn Dental Medicine Journal, a listing of the Top 2016 New Grant Awards in the Basic Science Departments omitted the following grant; it was the third-highest new grant award for 2016.

**Neutrophil Homeostasis And Periodontitis: Novel Concepts And Treatments**
Principal Investigator: Dr. George Hajishengallis, Dept. of Microbiology (NIDCR/NIH/ DHHS-LAD, $2,012,500)
FOR ALUMNUS DR. SCOTT De Rossi, D’95, GD’97, a former Penn Dental Medicine faculty member and administrator, lessons about oral medicine and interpersonal relationships learned while a student here have been key to an illustrious career path leading to the Deanship at the University of North Carolina at Chapel Hill School of Dentistry.

Dr. De Rossi was born and raised in Acushnet, Mass., the son of public educators who exemplified the value and rewards of a career in teaching. As a student at Providence College in Rhode Island, he met a retired oral surgeon who introduced him to the concepts of oral medicine. Recognizing both education and oral medicine as disciplines he wanted to pursue, he applied to the School of Dental Medicine, where he earned a DMD in 1995 and completed his oral medicine residency in 1997.

“I chose Penn because it is the preeminent oral medicine program in the world,” he says. “I knew a degree from Penn Dental Medicine would provide me with the skills and knowledge to be successful.”

While a student here, Dr. De Rossi was one of four in his class selected for the hospital track program, through which he interacted with students and faculty at the Medical College of Pennsylvania (now Drexel University School of Medicine), gaining medical perspectives that helped to shape his philosophy on the role of oral medicine in health.

“The word ‘dentist,’ when translated from French, essentially means ‘toothist,’” he says. “But dentists are so much more than that. Oral health professionals feel an obligation to focus far beyond the mouth and teeth alone—we are physicians of the entire oral and maxillofacial region. In oral medicine, we explore the interface between medicine and dentistry and its crucial role in overall health.”

“For a student and a resident, Dr. De Rossi was particularly influenced by faculty members Dr. Michael Glick, GD’88, (now, Professor of Oral Diagnostic Sciences at University of Buffalo School of Dental Medicine), Dr. Thomas Sollecito, D’89, GD’91, (presently, Professor and Chair of Oral Medicine at Penn Dental Medicine), and Dr. Martin Greenberg, D’68, (now, Professor Emeritus of Oral Medicine).”

“These men were instrumental in shaping my career,” he says. “They were role models in the importance of lifelong learning and continual improvement to a successful career in dentistry.”

After completing his residency, Dr. De Rossi spent a year at the School’s faculty practice as a staff dentist, then joined the faculty of the Department of Oral Medicine, where he was Assistant Professor of Oral Medicine until 2007. During his years at Penn Dental Medicine, he also held important administrative roles, including Director of the Oral Medicine Residency Program, Director of the Division of Graduate Dental Education, Assistant Dean of Admissions, and Chair of the Faculty Senate.

“I knew a degree from Penn Dental Medicine would provide me with the skills and knowledge to be successful.”

— SCOTT DE ROSSI (D’95, GD’97)
In 2007, Dr. De Rossi left Penn for a position at Augusta University in Georgia, where he chaired a new department at the dental school — Oral Health and Diagnostic Sciences. “It was an opportunity to build a department from the ground up, shaping the programs and curriculum with the knowledge I had gained at Penn,” he says. While at Augusta University, he became Director of the Section of Oral Medicine and the Clinical Center for Oral Medicine, as well as Vice-chair elect of the Faculty Senate.

**AT UNC, A RICH TRADITION OF EXCELLENCE**

In October of 2016, Dr. De Rossi was offered the position of Dean at the University of North Carolina (UNC) School of Dentistry, a public institution that draws more than 80 percent of its students from in state. He began his post as Dean in January 2017. Since relocating to Chapel Hill, Dr. De Rossi’s family, including his wife, Katharine, D’96, GD’98, GED’98 (whom he met at Penn Dental Medicine and who now specializes in oral medicine and geriatric dentistry in UNC’s faculty practice), and their daughters (Sofía, 15, and Evie, 13) have fallen in love with the area — and the school.

“UNC has a rich tradition of excellence,” he says, “The School of Dentistry is integrated into a top-tier university, and draws hard-working students and forward-thinking faculty. It’s a very diverse learning environment with an amazing network of influential, engaged, and generous alumni.”

His favorite aspect of being Dean, he says, is interacting with the warm and talented people he encounters each day, from staff to students to faculty, all of whom help make the school a special place.

**A MODEL FOR A SUCCESSFUL DEANSHIP**

“Part of who I am and how I see my role as Dean was shaped by Raymond Fonseca, the Dean of Penn Dental throughout my years as a student and a faculty member there,” he says. “Dean Fonseca created an open and friendly culture in which he had a personal relationship with his students as well as his faculty.”

Using his former dean as a model, Dr. De Rossi is already working toward his goals: to build an atmosphere of transparency, collaboration, and trust; to increase faculty development and recruiting of excellent faculty; to revolutionize the curriculum; and to create new high-impact programs. In achieving these goals, he aims to make UNC School of Dentistry one of the preeminent dental schools in the world.

“I am here to make a difference in the way dentistry is practiced, and to transform dentistry for better health,” he says. ■

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**WILL POWER.**

Gifts from alumni and friends have supported the mission of Penn Dental Medicine since it was founded. You can continue the tradition by considering a gift to the School through your estate. Planning a bequest can be an easy yet powerful way to provide resources for Penn Dental’s highest priorities: faculty and student support, research, and service.

**JUST A FEW SENTENCES ARE ALL THAT IS NEEDED.**

You can make a bequest by including Penn Dental Medicine as the beneficiary of your estate. It’s that easy. A bequest can be made in the form of a specific gift of cash or property, or a percentage of the remainder of your estate. Contact us for suggested language.

To learn more, contact:
Elizabeth Ketterlinus | Penn Dental Medicine
240 S. 40th Street | Philadelphia, PA 19104
215.898.3328 | ekett@upenn.edu | www.giving.upenn.edu/giftplanning
Q&A with Dr. Eric Spieler (D’84)
New Penn Dental Medicine Alumni Society Executive Board President

“We are at a unique place and time at Penn Dental Medicine,” says Dr. Eric Spieler (D’84), the recently elected President of the Alumni Society Executive Board. “So much has changed at the School. In addition to all the renovations, there’s been a tremendous improvement in the culture. There is a strong sense of community and support among students, faculty, and alumni, and I look forward to helping that continue to grow.”

As he takes on this alumni leadership post, Dr. Spieler succeeds Dr. Lee Durst-Roisman (D’83), who served as President since 2013. He credits Dr. Durst-Roisman and the School’s current alumni relations staff for making great strides in alumni engagement over the past four years. Dr. Durst-Roisman recruited both Dr. Spieler and his wife, Dr. Hope Berman (C’77, D’83), to the Executive Board in 2014 and 2013, respectively, and they have been actively involved since.

“Lee reconnected us to the School. It’s been exciting and rewarding to be part of the Alumni Board. I want to help get the word out to even more alumni that they need to come back to the School and see for themselves all the positive things going on here. It is markedly different from when we were students,” notes Dr. Spieler, who presently runs a multispecialty practice with his wife in Bala Cynwyd, Pa.

Dr. Spieler entered private practice with Dr. Berman when he graduated in 1984, and they have been in practice together in the Philadelphia region ever since. While also maintaining their private practice, Spieler founded the company Bioware, Inc. in 1992, inventing, patenting, and marketing a unique toothbrush. Their Alert Toothbrush, which would light up when users applied too much pressure while brushing, sold nationally via home-shopping network QVC. Dr. Spieler later channeled his entrepreneurial background to create and teach a course titled “The Inventive Dentist” through Penn Dental Medicine’s Selectives Program, which focused on how to take an idea and develop and market the invention.

We talked with Dr. Spieler shortly after he began his term as Alumni Society Executive Board President in July to ask him about his new role.

What are your key goals for the Alumni Executive Committee?
I want to build on the momentum Lee started as President. Her efforts helped inspire more and more alumni to re-engage with the School community and each other. The Executive Board is now extremely excited about the bright future of Penn Dental Medicine. There are many can-do people on our Board, and I think their passion has motivated more alumni to get involved. In fact, last year’s alumni reunion was our most successful yet in terms of attendance. I want to continue to develop the Alumni Board to make the connections with alumni even stronger. For example, we have surveyed the attitude of students during their time at Penn Dental Medicine, and we are responding proactively to improve the dental school experience. We want to make sure that our students have a positive experience during their time at Penn Dental.

Why do you feel it is important for alumni to stay connected to the School and each other?
We love dentistry and we know we received a stellar education here — so what better place than at Penn Dental to reunite? Plus, I think once you get involved you see the many benefits
and rewards of connecting with other alumni, faculty, and the current students. The students are so smart and charming; they have been handpicked to be our future leaders in dentistry.

What are some of the rewards of alumni involvement?
The School now offers several cutting-edge continuing education classes throughout the year that are completely free for alumni. These classes are not only a valuable resource, they’re also a great way to reconnect with friends and meet new colleagues. The School supplies food and drink and time before and after the CE to reconnect. I also encourage alums to give back through teaching and mentorship. I hope to be teaching CAD CAM dentistry at the School this year. I’ve learned so much through my teaching here, both from students and peers. Nurturing our junior colleagues and building a supportive community creates opportunities and a feeling of great satisfaction for us all.

How is Penn Dental Medicine growing today?
Being more involved with the Alumni Society has given me a front row seat for many of the amazing changes happening. We have had a substantial renovation and upgrade of the Evans Building over that past two years, and currently, the Main Clinic is under renovation. You can feel a strong sense of community throughout the building. This is a very special time because our facilities are top notch, our faculty is stellar, and Penn Dental Medicine’s reputation around the world is among the elite. I think people will look back 25 years from now and say, “Wow, look at what happened then; it was truly a renaissance.” We have to thank Dean Denis Kinane for his vision and leadership in elevating Penn Dental Medicine.

On a personal note, what are some of your interests outside of dentistry?
I enjoy oil painting, which I’ve done for the last eight or nine years, and I’ve shared my work in several shows. Right now, with a close friend, we’re in the midst of building a wooden sailboat from scratch.

FY17 Giving & Engagement
By the Numbers

TOTAL GIVING
$9.22M
$11% of alumni made a gift in FY17
$47% of all FY17 donors have been consecutive donors for 3 or more years

TOTAL GIFT COMMITMENTS TO PENN DENTAL MEDICINE IN FY17
$8.81M
$1115 annual giving donors (14% were young alumni, classes 2002-2016)
102 Benjamin Franklin Society members

ENGGAGEMENT
1,277 attended a Penn Dental Medicine event in FY17
842 alumni have added their practices to Find a Penn Dentist
250 downloads of the Evans360 virtual reality app

ANNUAL GIVING (UNRESTRICTED)
$460K
11% of all FY17 donors have been consecutive donors for 3 or more years

ATTENDED A PENN DENTAL MEDICINE EVENT IN FY17
RAISED TOWARD CAPITAL & ENDOVED INITIATIVES IN FY17
GIFTS RAISED TOWARD UNRESTRICTED ANNUAL FUNDS IN FY17

Making Connections:
We Want to Hear From You
Alumni Communications & Engagement Survey

Please take a minute to complete the enclosed survey (bound in the center of this issue) to help us plan alumni programs and communications that meet your interests.
A postage-paid envelope is also enclosed.

Complete the survey online at www.dental.upenn.edu/survey
ALUMNI WEEKEND 2017
Penn Dental Medicine welcomed back alumni May 12–13 for Alumni Weekend 2017 — the reunion years for classes ending in “2” or “7”. Save the date for Alumni Weekend 2018, May 11-12!

PENN ENDO, LEADING THE WAY FOR 70 YEARS
In April, Penn Dental Medicine headed to New Orleans for the Annual Meeting of the American Association of Endodontists (AAE). Alumni from around the world gathered for a special reception celebrating 70 years since the first class graduated under Dr. Louis I. Grossman. Almost 200 alumni attended.

AAOM ALUMNI RECEPTION
Penn Dental Medicine enjoyed making new, and strengthening existing connections with alumni at the American Academy of Oral Medicine (AAOM) Annual Conference in Orlando this past April.
AAP ALUMNI RECEPTION
A Boston alumni reception was held in conjunction with this year’s American Academy of Periodontology (AAP) Meeting in September. Over 80 alumni joined Penn Dental Medicine in welcoming Dr. Ricardo Teles as the new Chair of the Department of Periodontics.

SENIOR FAREWELL 2017
The School held its annual Senior Farewell dinner for the Class of 2017 on May 9. We enjoyed celebrating the Class’s accomplishments, and welcoming them into the Penn Dental Medicine Alumni Society.

SAN FRANCISCO ALUMNI RECEPTION
Penn Dental Medicine alumni in the San Francisco area gathered at Wharton San Francisco for a night of networking and fun.

The recipients of the annual faculty awards.

The 2017 Omicron Kappa Upsilon (OKU) inductees with fellow members.
1960s

Robert B. Summers (C’61, D’65, GD’67) was presented with an Alumni Award of Merit at this year’s Evans Centennial Renaissance Celebration during Alumni Weekend 2017.

Joseph ‘Buz’ Hanley (D’67, GD’69) and his wife Pat had two children while at Penn Dental Medicine, Chip and Michael. Dr. Hanley completed an oral surgery residency, and then served in the U.S. Army Dental Corps. Private practice in Hyattsville, MD, and Bristol, CT, followed, and as an active reservist, he was recalled to active duty in 1991. After the military, he and Pat moved to the Berkshires. Dr. Hanley was on the teaching staff of the Berkshire Medical Center dental residency program for several years. He then took a part-time position as the oral surgeon with the Veterans Administration in Northampton, MA, but retired in 2011. Now, he and his wife enjoy traveling, spending time with family, and seeing old friends.

1970s

Debra More Williams (DH’72) is finally returning to the U.S., after 15 years in Prince Edward Island, Canada. She has spent most of her time there in the hospitality business, owning and operating resorts in the area. Soon, she will be joining her daughter in Silver Spring, MD.

Elliott K. Gutman (D’73) recently celebrated the marriage of his last child, Caryn, a CPA, who wed Jonathan Cohen, a lawyer from Montreal. Joining in the celebration was his wife Breinnie of 41 years, his three other children, their spouses, and numerous grandchildren. Dr. Gutman is still practicing dentistry full time. Listening to the advice of his office manager, Maria Pimentel, who has been with him for 32 years, he acquired an additional practice. Dr. Gutman feels his Penn Dental Medicine education instilled him with values that prepared him for a life of service to family, staff, patients, and community.

Harold Baumgarten (D’77, GD’82) was presented with an Alumni Award of Merit at this year’s Evans Centennial Renaissance Celebration during Alumni Weekend 2017.

After dental school, Arlene Dannenberg Bowes (D’77) joined USPHS and rose to the rank of Captain by the time President Obama disbanded the Inactive Reserves. After active duty, she worked in several private offices, and did short tours of duty on Indian reservations and in the aftermath of Hurricane Katrina. She has been teaching part-time at Penn Dental Medicine for over 20 years. She is married to a marine engineer turned industrial hygienist. Together, they have two grown children. Now, she is swimming almost as often as she did in dental school, and enjoys hiking, kayaking, and racing sailboats on the Chesapeake Bay.

1980s

Debra More Williams (DH’72) has spent most of her time in Prince Edward Island, Canada. She has spent most of her time there in the hospitality business, owning and operating resorts in the area. Soon, she will be joining her daughter in Silver Spring, MD.

Ann E. Eshenaur Spolarich (DH’82, GED’99) is the recent co-editor of a new textbook, Prevention Across the Lifespan: A Review of Evidence-Based Interventions for Common Oral Conditions. Many schools are already adopting the text for their curriculum.

Lisa Rife Guenst (DH’83) and his company ToothShower launched on KickStarter.com with an oral home care suite for your shower. Find out more at www.toothshower.com.

Penn Dental Medicine joins Robert Brody (C’80, D’84) in celebrating the news that Great Expressions Dental Centers was named the “Fastest Growing Company of the Year” by the American Business Awards. Dr. Brody is affiliated with the Miami branch of this booming organization.

Donna Galante (D’84, GD’86) was named “Invisalign’s Educator of the Year” for 2016. In addition to traveling the world training doctors to use Invisalign, she also maintains a private practice in Carmichael, CA.

Members of the Class of 1978 had an unofficial reunion in June 2016 to spend an evening together and to pay tribute to their classmate, Gail Yarnell, who had, sadly, passed away two months earlier. Attending the dinner were (left to right) Andrew Greenstein, Ken Weiss, Larry Amsterdam, Neal Slutsky, Harvey Nash, Dan Fried, Dennis Warshawsky, Allan Horowitz, Sid Chonowski, Larry Erich, and Artie Dean.

On June 9, Saul Pressner (D’79) was a featured speaker on WBAI/NYC radio’s “Take Charge of Your Health” show, speaking on the topic of Biomimetic Dentistry. Dr. Pressner is currently the President of the Academy of Biomimetic Dentistry (www.aobmd.org) and a member of the Penn Dental Medicine Dean’s Council.

As a Fellow of the International Team for Implantology (ITI), Robert A. Levine (GD’84) was invited to present his paper “Keys for Successful Esthetic-Zone Single Immediate Implants” at the ITI World Symposium in Basel, Switzerland. Over 5,000 professionals were in attendance, making this conference one of the “largest dental implant meetings ever held.” Dr. Levine and his family of dentists also maintain a non-profit called the Growing Smiles Foundation, where they focus on providing dental care to orphans in Peru.
Alisa Kauffman (D’85) was featured on the cover of the May/June 2017 issue of the Pennsylvania Gazette for her unique dental practice. Dr. Kauffman travels to the homes of elderly patients who are incapable of traveling to the dentist. Her mobile practice, Geriatric House Call Dentistry, was also recently featured in The Washington Post.

Jean Dragani Spitofsky (D’87) is a proud Penn parent to Nina Spitofsky, a junior in the College of Arts and Sciences.

1990s

Luis J. Fujimoto (D’90, GD’93) was elected Chairman of the Board of Trustees of the American Association of Dental Boards Foundation, Chicago, IL. He is in the private practice of Comprehensive Dentistry with Advanced Services in Implants and Oral Rehabilitation in New York, NY.

Bernard Costello (D’94, M’97, GD’00, RES’00) has been named Interim Dean of the University of Pittsburgh School of Dental Medicine, effective February 1, 2018. At the present time, Dr. Costello is a Professor of Oral and Maxillofacial Surgery and Associate Dean for Faculty Affairs at the University.

2010s

Steven Lin (D’15) was featured in the May/June 2017 issue of the Pennsylvania Gazette for his unique dental practice working with the federal Indian Health Service to provide dental care and education to indigenous Alaskans in extremely remote areas. In January, he plans to bring his mobile dentistry expertise to New York City, where he will join Alisa Kauffman (D’83) as a partner in her mobile practice, Geriatric House Call Dentistry.

The Dean’s Council welcomes Tony Saito (D’95) as a new member, representing the New England region and pediatric dentistry. Dr. Saito is a past president and current member of the Massachusetts Academy of Pediatric Dentistry, and is also a member of the Massachusetts Dental Society, the American Academy of Pediatric Dentistry, and the American Dental Association. He has frequently shared his knowledge of pediatric dentistry with PDM residents and DMD students interested in the specialty as a possible career. This past June, he held a Q&A session with current pediatric residents and predoctoral students in the Penn Pediatric Society to give his insight on “life after residency.”

Rose Wadenya (D’97) runs a busy pediatric dentistry practice in Havertown, PA. She is also the author of a variety of children’s books about teeth. They can be found at www.rosewadenyabooks.com.
IN MEMORIAM

REMEMBERING MEMBERS OF THE
PENN DENTAL MEDICINE COMMUNITY

Ann Miller Jaggard (DH’41)
Houston, TX; June 19, 2017

Robert Litowitz (D’43)
Miami, FL; January 14, 2017

Edward H. Ziegler, Jr. (D’43)
Providence, RI; July 10, 2017

Jane Dickson McKee (DH’45)
Frederick, MD; November 29, 2016

Eleanor L. Nystrom (DH’46)
Indiana, PA; August 16, 2017

Irene Lesko Sinanis (DH’47)
Trumbull, CT; May 17, 2017

Bernard Evans (GD’48)
Merion Station, PA; December 6, 2016

Gladys S. Cavanaugh (DH’49)
Phoenix, AZ; April 12, 2016

Franklyn D. Church (D’49)
Chapel Hill, NC; August 29, 2016

Edward R. Esposito (D’50)
Sarasota, FL; January 22, 2017

Kenneth K. Kline (GD’51)
Wheeling, WV; February 10, 2017

Marjorie Naame Cook (DH’51)
Longport, NJ; August 20, 2017

Nancy Coles Conover (DH’52)
Morristown, NJ; March 22, 2017

C. Peter Chaconas (D’53)
Silver Spring, MD; February 13, 2017

Helen Lucas Price (DH’53)
Portland, OR; January 1, 2017

Sally H. Dupler (DH’57)
Naples, FL; October 14, 2016

William Moore (D’57)
West Chester, PA; January 1, 2017

John S. Parianos (D’59)
Peabody, MA; February 2, 2017

Judith Satin Hollm (DH’55)
Bloomfield, CT; April 14, 2017

Naples, FL; March 7, 2017

Thomas J. Garrett (D’58)
Naples, FL; March 7, 2017

Austra J. Miezis (D’58)
Philadelphia, PA; January 6, 2017

Edgar F. Geigel (D’60)
Austin, TX; April 9, 2017

E. A. Kolbjornsen (D’67)
Minneapolis, MN; January 19, 2017

Richard A. Gordon (D’61)
The Villages, FL; April 18, 2017

Charles Paul Mirabile (D’61)
Delray Beach, FL; February 9, 2017

John Cuozzo (D’62)
Norfolk, VA; March 23, 2017

George D. Harff (D’58, GD’62)
Albany, NY; June 21, 2017

William B. Humphrey (D’62)
Bluffton, SC; May 14, 2017

Allen R. Savage (D’63)
North Brunswick, NJ; June 12, 2016

Maury L. Glickman (D’75)
Bridgeport, NJ; April 27, 2017

Anthony J. Ciotti (D’77)
Virginia Beach, VA; July 1, 2016

Stewart V. Haggerty (C’54, D’65)
Devon, PA; June 20, 2015

Alan R. Meyer (D’66)
Glenmont, NY; August 19, 2017

Michael J. Collins (D’67)
Fort Myers, FL; November 26, 2014

Nelson Wood (D’82)
Hyannis, MA; May 6, 2017

Jeffrey P. Ruff (D’83)
New City, NY; April 11, 2017

Yi Zuo (D’00, GD’01)
Philadelphia, PA; September 1, 2017

Gayathri S. Konchady (D’14)
Acworth, GA; March 10, 2017

Carl W. Gardiner, Jr. (D’68)
Jupiter, FL; March 17, 2017

Jeffrey J. Brown (D’70)
Georgetown, DE; December 4, 2016

Berkey S. Clark (D’71)
Ocean City, NJ; February 25, 2017

Edwina Summerfield (DH’72)
Phoenixville, PA; May 25, 2017

Ira D. Rappaport (D’74)
Lancaster, PA; April 10, 2017

REFERENCES


(continued from page 21)
Switching to CBCT technology from MDCT /MSCT resulted in shorter scan time, selective beam limitation, greater image accuracy, reduced patient dose, user-friendly interactive display models, multiplanar reformation (including panoramic reconstructions), 3D volume rendering, and simulated cephalometric and skull views (via “Ray Sum” or “Ray Casting”) to name a few.4 The most fascinating part of CBCT technology is its ability to procure datasets that are isotropic in nature, as the acquisition of basis images in this technology depend on the pixel size of the detector rather than the acquisition of groups of rows with sequential translational motion leading to columnar images where heights differ from the width and depth dimensions (Anisotropic).4 In other words, CBCT images are less prone to distortions and remain anatomically accurate in all viewing planes.

CBCT volumes also have their share of artifacts, but these can be minimized if the acquisition protocols are properly followed and patient motion is minimized. Metallic restorations that lead to beam-hardening artifacts are a common issue, so researchers are developing algorithms to reduce them to an acceptable level for interpretation. Overall, CBCT imaging is a technology that is here to stay.
UPCOMING EVENTS & PROGRAMS

2017/2018 CALENDAR

NOVEMBER

NOVEMBER 4, 2017
Penn Museum, Philadelphia, PA

Tours of the Evans Collection
Penn Dental Medicine

NOVEMBER 17–18, 2017
CDE: Nitrous Oxide/Oxygen Analgesia Certification
Penn Dental Medicine

NOVEMBER 27, 2017
Greater NY Dental Meeting Alumni Reception
The Penn Club NYC, New York, NY

Greater NY Young Alumni After-Party
Stout Midtown, New York, NY

FEBRUARY

FEBRUARY 12, 2018
Miami Alumni Reception
Il Gabbiano
Miami, FL

FEBRUARY 13, 2018
Naples Alumni Reception
Quail Creek Country Club, Naples, FL

FEBRUARY 27, 2018
Alumni Lecture Series CDE: Update on Diagnosis and Management of Oral and Oropharyngeal Cancer
Penn Dental Medicine

FEBRUARY 28, 2018
Academy of Osseointegration Conference Reception
Los Angeles, CA

MARCH

MARCH 7, 2018
Valley Forge Dental Conference Alumni Reception
King of Prussia, PA

MARCH 8-11, 2018
CDE: Penn Dental Alumni Ski Trip
Breckenridge, Colorado
Contact Maren Gaughan, gaughan@upenn.edu for information

MARCH 21, 2018
American Association for Dental Research (AADR) Reception
Fort Lauderdale, FL

APRIL

APRIL 1-4, 2018
CDE: Penn Endo Global Symposium
Jeddah, Saudi Arabia

APRIL 7, 2018
Oral Cancer Walk
Penn Dental Medicine

APRIL 10-14, 2018
American Academy of Oral Medicine (AAOM) Alumni Reception
San Antonio, TX

APRIL 25-28, 2018
American Association of Endodontics (AAE) Alumni Reception
Denver, CO

MAY

MAY 4-8, 2018
American Association of Orthodontics (AAO) Alumni Reception
Washington, DC

MAY 8, 2018
Senior Farewell
The Bellevue, Philadelphia, PA

MAY 10, 2018
Research Day 2018
Penn Dental Medicine

MAY 11-12, 2018
Alumni Weekend 2018
Penn Dental Medicine

MAY 14, 2018
Commencement
Penn Dental Medicine

MAY 24-26, 2018
American Association of Endodontists (AAE) Alumni Reception
Denver, CO

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Visit www.dental.upenn.edu/events or call 215-898-8951 for information on alumni events.

Visit www.dental.upenn.edu/cde or call 215-573-6841 for information on continuing dental education programs.
ONCE AGAIN, we are pleased to present this special research supplement to the Penn Dental Medicine Journal. In it are highlights from four research meetings held by Penn Dental Medicine since the start of 2017, events that brought together leading researchers and clinicians from across the country and around the world. In June of this year, Penn Dental Medicine hosted two conferences — the Penn Periodontal Conference 2017 and the 2nd Biennial Meeting of the International Academy for Adhesive Dentistry. The inaugural Penn Stem Cell and Regenerative Dentistry Conference just recently took place this October; and this past May, our faculty and students gathered to share their work through the School’s annual Research Day — a program that demonstrated the great depth of research activities within the Penn Dental Medicine community.

Creating such forums that facilitate the exchange of ideas among investigators and help build new collaborations is a vital part of the School’s mission and important to our ongoing research growth and leadership. Whether building multidisciplinary collaborations between our own basic and clinical science departments, among colleagues from the other Penn schools, or with other universities and institutions here and abroad, it is this integration of knowledge that advances the science and practice of dental medicine and other fields as well.

The impact of the School’s research and scholarship is far reaching with diverse applications. Within 2016, 160 research articles were published by Penn Dental Medicine’s standing faculty members, while the depth the School’s research continued to grow through faculty recruitment. New standing faculty members joined the departments of Anatomy & Cell Biology and Oral & Maxillofacial Surgery in 2016 and the departments of Periodontics and Microbiology to date in 2017. The new recruits considerably expand Penn Dental Medicine research in the bone field as well as research in clinical microbiology related to periodontal disease and cancer. The latter is an emerging research area that links microbial infection with the behavior of cancers.

We are also building upon the academic programs that promote research — from our DScD and MSOB degree programs for postdoctoral students to our research honors, summer research program, and dual-degree opportunity in translational research for our DMD students. In addition, this year we continued to enable students and young investigators to present their work on an international stage through the School’s AADR/IADR Travel Grant Award program, with 10 DMD students and six postdoctoral and junior investigators attending the 2017 IADR/AADR/CADR General Session & Exhibition.

Indeed, Penn Dental Medicine is continuing to build on its position as an international leader in the generation of new knowledge and treatment modalities in oral health and beyond.

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Dana Graves, DDS, DMSc
Vice Dean for Research and Scholarship; Professor, Department of Periodontics; Director, DScD Program

Since the start of 2017, four research meetings have been held at Penn Dental Medicine, bringing together researchers and clinicians from across the country & around the world.
Penn Periodontal Conference 2017

The program speakers represented 28 universities within the United States, Europe, Asia, and South America. The conference launched with an evening of presentations by junior researchers and the three-day scientific program featured a series of speakers each day addressing topics within the areas of regeneration and 3D printing, bone formation, microbiology, and host response. There was also a session on research updates and a day focusing on special topics in periodontics.

Highlights also included two keynote addresses — “Genetic and Translational Approaches to Cardiovascular Risk,” presented by Dr. Daniel J. Rader of the University of Pennsylvania School of Medicine; and “Novel Topical Drug Delivery Approach to Enhance Oral Health,” presented by Dr. Henry Daniel, Professor, Department of Biochemistry, from Penn Dental Medicine.

The program was structured to encourage interaction among participants, and a poster presentation session was an integral part of the conference, providing the opportunity for participating researchers to share their work and talk one-on-one with each other.

“I was very impressed by the lively discussions and the exchange of information. Several new and established concepts were examined that led to interesting conversations” notes Dr. Dana Graves, Vice Dean for Research and Scholarship and Professor, Department of Periodontics, who organized and hosted the event with Dean Kinane. “We welcomed postdoctoral researchers and PhD students along with highly accomplished researchers; such a forum is of critical importance to advances in our discipline and to career development.”

The next Penn Periodontal Conference is anticipated to be held in 2019.
Luiz Bertassoni, DDS, PhD, Division of Biomaterials and Biomechanics, School of Dentistry Center for Regenerative Medicine, School of Medicine Department of Biomedical Engineering, School of Medicine Oregon Health and Science University

Your topic?
My presentation addressed recent developments on the engineering of bone scaffolds that are 3D printed with long blood vessels homogeneously distributed inside them. We hope this will allow for reconstruction of large craniofacial defects.

Your major finding?
The major finding was that although calcium phosphate (CaP) scaffolds are great for new bone formation, they may slow down formation of blood vessels. Still, long, hollow, and functional blood capillaries can be 3D printed together with osteogenic CaP scaffolds for efficient vascularized bone regeneration.

The clinical importance?
Large bone defects in craniofacial reconstruction or implant therapy are difficult to heal and regenerate, primarily due to lack of vascular supply in the existing scaffold materials. With the technologies that we have been developing, we hope to overcome these barriers by 3D printing patient-specific osteogenic scaffolds together with the vasculature, thereby eliminating many of the existing problems in bone regeneration.

David Scott, PhD, University of Louisville School of Dentistry

Your topic?
Marijuana, oral bacteria, and periodontal disease

Your major finding?
Cannabis use predisposes individuals to destructive periodontal diseases. The underlying mechanisms may include phytocannabinoid-related microbial toxicity that could promote dysbiosis (a microbial imbalance) and a suppressed innate response to periodontal pathogens.

The clinical importance?
Oral health care professionals should contemplate the implications of marijuana consumption when considering patient education, prevention, and treatment.

Jerry (Jian Q.) Feng, MD, PhD
Assistant Dean for Research, Professor and Vice Chair Biomedical Sciences, Texas A&M College of Dentistry

Your topic?
Critical roles of periodontal ligament (PDL) cells in alveolar bone formation

Your major finding?
Our major findings are three-fold. First, PDL is the major bone cell resource for alveolar bone formation, which has much higher bone mineralization rates than from other bone cell sources, such as periosteum and bone marrow cells. Second, osteocytes, instead of osteoblasts, are the key cells in bone mineralization and there are severe defects in osteocytes obtained from periodontitis patients. And third, blocking sost, a potent inhibitor molecule released from osteocytes, restores the bone loss and PDL damages in periodontitis animal models in vivo.

The clinical importance?
In the future, anti-sost monoclonal antibodies can be used in restorations of bone losses and PDL defects in patients with severe periodontitis.
2nd Biennial Meeting of the IAAD

PENN DENTAL MEDICINE brought together leading international researchers and clinicians in the field of adhesive dentistry as hosts of the 2nd Biennial Meeting of the International Academy for Adhesive Dentistry (IAAD), held June 16–17. This two-day event, titled “Just bond it!,” was developed under the leadership of Dr. Markus Blatz, Professor and Chair of Preventive & Restorative Sciences at Penn Dental Medicine, and the current IAAD President.

“Dental adhesion, in simplified terms, “bonding”, along with new digital and CAD/CAM technologies, has literally transformed restorative dentistry. It allows us to be less invasive and apply the most esthetic materials, many of which rely on proper bonding techniques to function in the oral cavity,” says Dr. Blatz. “The IAAD is an international platform for connecting relevant research with excellent clinical care in adhesive dentistry. This philosophy was the main driver for the meeting.”

The “Just bond it!” program featured a roster of international speakers on a variety of topics within adhesive dentistry, poster sessions on current research, and a corporate scientific forum. In addition, there was an IAAD-sponsored consensus conference on the topic of restoration of endodontically treated teeth. Concurrently, a pre-conference hands-on course was presented by Dr. Simone Deliperi (Sardinia, Italy) on anterior and posterior composite-resin restorations.

“This hands-on course gave participants an opportunity to learn sophisticated techniques directly from one of the great masters,” notes Dr. Blatz. It was held in the School’s new state-of-the-art preclinical simulation laboratory.

The main program, which stretched over two days, was structured to showcase the wide field of adhesive dentistry from micro-invasive bonding techniques to dental laboratory protocols for indirect bonded restorations.

The poster sessions were an integral part of the meeting, with 29 poster presentations in the categories of students, junior researchers, and clinician faculty. First through third place awards were presented in each category (see page 41 for highlights of top awardees in each).

Abstracts of all the posters presented are available at the IAAD web site, www.adhesivedentistry.org. Abstracts and outcomes of the consensus conference on the restoration of endodontically treated teeth will also be featured in an upcoming special issue of the Journal of Adhesive Dentistry.

The next IAAD meeting will be held in 2019 in Bologna, Italy. “Penn Dental Medicine faculty will again play a lead role in the organization of this event, and in turn, in the progression of modern-day dental concepts and techniques around the world,” says Dr. Blatz.
IAAD RESEARCH AWARD HIGHLIGHTS

The research poster presentations at the IAAD meeting were judged in three award categories; following are highlights of the studies that took first place in each.

Presidential IAAD Student Scientist Award 1st Place
Influence of a Novel Self-Priming Etchant on Bond-Strength to Glass-Ceramics
Haifa Alsobiyl, Abdulrahman Alshabib, Neimar Sartori, Sillas Duarte, Jin-Ho Phark
Ostrow School of Dentistry of University of Southern California

This presentation reported on a laboratory study that evaluated the influence of a novel self-priming ceramic etchant on micro-tensile bond strength (µTBS) to leucite reinforced glass-ceramic and lithium-disilicate reinforced glass-ceramic. CAD/CAM samples were fabricated from lithium disilicate reinforced glass-ceramic (IPS e.max CAD, Ivoclar Vivadent) and leucite reinforced glass-ceramic (IPS Empress CAD, Ivoclar Vivadent). Different surface treatment methods and materials were employed to test bond strength of dual cure resin cement (RelyX Ultimate, 3M ESPE) after treatment with a novel self-priming etchant to these materials before and after 6 months of water storage. Bond strength values varied from 0 to almost 50 MPs based on the type of pretreatment applied. The major finding was that long-term efficacy of a novel self-priming ceramic primer is highly variable among the two ceramic materials tested and dependent on the ceramics’ composition and structural arrangement. Since these materials are used in private practice, understanding the performance of different ceramic primers and bonding agents is of fundamental importance.

Fusayama IAAD Junior Scientist Award 1st Place
Bioactive Rechargeable Dental Adhesive Based on Calcium Phosphate Nanoparticles to Inhibit Demineralization
Mary Anne Sampaio De Meloa, Xianju Xie, Dan Xing, Michael D. Weir, Mark Reynolds, Yuxing Bai, Hockin Xu

University of Maryland School of Dentistry
Capital Medical University School of Stomatology, Beijing
China Rehabilitation Research Center, Beijing, China

Bioactive dental adhesives are attractive biomaterials for various applications in dentistry, for example, in orthodontics to inhibit white-spot lesions (WSL) in enamel. This presentation reported on a study of a novel rechargeable dental adhesive containing nanoparticles of amorphous calcium phosphate that allow calcium and phosphate ion release, recharge, and durable re-release capabilities to enhance tooth structure remineralization and inhibit demineralization. The novel adhesive had substantial Ca and P ion release, recharge and long-term re-release, while possessing good bond strength to enamel, suitable for orthodontic use to inhibit enamel demineralization and WSL. These findings are quite important and with high clinical relevance as the novel rechargeable adhesives are promising for orthodontics, crown cements, cavity liners, varnishes and composites, and other preventive and restorative applications.

IAAD Clinician Award 1st Place
Direct Flowable Restorations Utilizing Injection Technique: The Digital Approach
Saro Atam, Markus B. Blatz, Eva Anadioti, Julian Conejo
University of Pennsylvania School of Dental Medicine

This presentation described the clinical application of a composite injection to create direct composite veneers as definitive restorations. An innovative approach of combining digital technology and injection technique was used to treat malpositioned lateral incisors. After obtaining medical and dental history, clinical examination, diagnostic intraoral scanning with Cerec (Sirona) and photographs were obtained to provide data for diagnosis and treatment planning, which included four anterior composite veneers on teeth #7,8,9, and 10. A 3D printed model was fabricated after digital smile design analysis and digital wax-up. A clear vinyl polysiloxane material was used to create the transparent injection matrix. After minimal tooth preparation, etching, and bonding, flowable resin composite was injected through the transparent matrix and light-cured with the matrix in place. Each tooth was bonded separately and, after excess removal, refined and polished. The direct flowable composite technique is minimally invasive, time-efficient, and cost-effective. When combined with digital technology, the results are predictable and the process is more efficient than when combined with conventional techniques.

TOP, RIGHT: (left to right) Incoming IAAD president Dr. Lorenzo Breschi, current president Dr. Markus Blatz, and past president Dr. Jean-Francois Roulet.
Research Day 2017 Celebrates Faculty, Student Research

PENN DENTAL MEDICINE brought faculty and students together to share their research activities with one another and spotlight the depth of the School’s research enterprise at Research Day 2017, held May 11 at the School. This was the second year for a combined student and faculty research event, designed to showcase the research being conducted throughout the Penn Dental Medicine community.

“Penn Dental Medicine Research Day now embraces all aspects and levels of research activities in the School, highlighting the great work of our faculty, junior researchers, and students,” says Dr. Hyun (Michel) Koo, Chair of Penn Dental Medicine Research Day 2017. “It provides a forum for us all to learn more about each other’s work.”

The day’s program included seven faculty presentations and two invited keynote speakers, along with a poster session what include 122 posters representing student as well as faculty/junior investigator projects.

Presenting faculty highlighted recently published research in both the basic and clinical sciences. Topics ranged from findings on the impact of diabetes on the oral microbiome (by Dr. Dana Graves, Dept. of Periodontics) and the role of the yeast-bacteria interaction in early childhood caries biofilm (by Dr. Geelsu Hwang, Dept. of Orthodontics) to a study on a receptor protein that may provide new approaches to inflammatory diseases (by Dr. Hydar Ali, Dept. of Pathology) and another on linking mechanical strain to neuroinflammation (by Dr. Claire Mitchell, Dept. of Anatomy & Cell Biology).

In other faculty presentations, Dr. Henry Daniell, Dept. of Biochemistry, talked on his work using a novel drug delivery approach, sharing that biopharmaceuticals can be delivered topically in chewing gum. The chewing gum, he explained, is impregnated with enzymes and antimicrobial peptides that are produced in plant cells to disrupt biofilms that form on teeth. In addition, Dr. Shuying (Sheri) Yang, Dept. of Anatomy & Cell Biology, discussed the discovery in her lab of a new bone protein (regulator of G protein signaling protein 12) that plays a key role in osteoporosis and inflammation-caused bone loss; and Dr. Chider Chen, also in the Dept. of Anatomy & Cell Biology, reported on findings that mesenchymal stem cell therapy can effectively rescue osteopenia and skin fibrosis in systemic sclerosis.

The day’s keynote lecturers included Dr. Kam W. Leong, Samuel Y. Sheng Professor of Biomedical Engineering at Columbia University, speaking on the topic of “Bioengineering of Direct Cellular Reprogramming,” and Dr. Martha Somerman, Director of the NIH’s National Institute of Dental and Craniofacial Research, presenting the Joseph L. Rabinowitz Memorial Lecture on “NIDCR: Leading Advances in Oral Health Research and Innovation.”

“I thoroughly enjoyed my visit to Penn Dental Medicine Research Day, which provided an opportunity for me to engage with faculty at the school and the broader campus,” says Dr. Somerman. “The quality of research presented by the students was impressive, as is the vision set forth for the school by the leadership team.”

A strong representation of the current research throughout the School was featured in the poster presentations, which along with 44 faculty/junior researcher posters, included 78 student projects from the Summer Research Program, the School’s honors programs, the Bridging the Gaps community-internship program, and other independent student research. A faculty panel judged the student posters, presenting the Vernon Brightman Research Society Awards in first through third-place (see page 43). In addition, student and postdoctoral/young investigator research was also recognized with the awarding of the 2017 AADR Travel Grants; this year 10 DMD students and 12 individuals representing Master of Science in Oral Biology and Doctor of Science in Dentistry residents and junior investigators received Travel Grant awards. The AADR Travel Grant program was launched by Penn Dental Medicine in 2014 to build opportunities to advance ongoing research and leadership among students and junior researchers; this year’s recipients will attend and be encouraged to present their work at the 2108 AADR/CADR Annual Meeting to be held in Fort Lauderdale, Fla., in March 21-24, 2018. The 2017 Joseph and Josephonide Rabinowitz Award for Excellence in Research was also presented to faculty (see page 43).

An event like Research Day can help advance research within the School in a number of ways, notes Dr. Dana Graves, Vice Dean for Research and Scholarship. “Research Day is a wonderful opportunity for researchers from different disciplines to share what they are doing and learn from each other,” says Dr. Graves. “It allows students, basic research faculty, and clinical faculty to appreciate the accomplishments of each. It’s a great day of exchange.”
The Joseph and Josephine Rabinowitz Award for Excellence in Research is presented annually to Penn Dental Medicine investigators. The endowed award was established by the Rabinowitz family in 2002 to support and encourage independent research. This year’s award recipients, presented at Research Day 2017 include:

Dr. Sunday Akintoye, Associate Professor, Dept. of Oral Medicine

Radiation therapy for head and neck cancers can lead to the complication of jaw osteoradionecrosis. Dr. Akintoye’s lab will explore the application of mesenchymal stem cells and osteoanabolic therapy for prevention and remediation of osteoradionecrosis.

Dr. Bei Zhang, Postdoctoral Fellow, Dept. of Biochemistry

Dr. Zhang will work on a project that focuses on the expression of human coagulation factors in edible plant chloroplasts for treatment of life-threatening bleeding disorders and evaluation of post-translational modifications. This approach offers noninvasive drug delivery and eliminates the immunogenic side effects of clotting actors currently used in the clinic.

Research Day 2018 will be held Thursday, May 10, leading into Alumni Weekend 2018, May 11-12. “We encourage alumni to join us,” adds Dr. Koo. “It is a unique opportunity to interact with faculty and students and hear about the research at Penn Dental.”

VERNON BRIGHTMAN SOCIETY RESEARCH AWARDS

Following are highlights of the student research projects that received the Vernon Brightman Society Research Awards at Research Day 2017.

CBCT Assessment of Pubertal Growth Using Staging Methods in Orthodontics
Hassan M. Khan (D’18) was awarded first place for this study, conducted with preceptor Dr. Mel Mupparapu, Dept. of Oral Medicine

Assessment of pubertal and skeletal growth can play a pivotal role in assisting in timely orthodontic treatment. In his study, Hassan looked at three potential growth/development biomarkers to compare their reliability and validity. The study examined the sphen-occipital synchondrosis, mandibular third molars, and cervical vertebrae using the 5-stage method, Demirjian method, and Cervical Vertebral Maturation Staging (CVMS) methods for prediction of pubertal growth using CBCT data sets. They found that the CVMS correlated most closely with pubertal growth and appears to be the best way to determine skeletal growth.

Changes in RPE Peroxisome Lipid Metabolism in Response to Light Onset
Jennifer A. Caughey (D’19) was awarded second place for this study, conducted with preceptors Dr. Kathleen Boesze-Battaglia and Lauren Daniel, Dept. of Biochemistry

Jennifer’s research project was focused on evaluating the peroxisomal metabolism of cells found within the Retinal Pigment Epithelium (RPE) — a supportive layer of epithelium that faces the retina within the eye. It was found that there is a diurnal regulation of this metabolic pathway based on an increase in peroxisome function in the morning when compared to the afternoon. RPE cells are vital for healthy eye function, and a better understanding of this metabolic pathway can help assist in the treatment of degenerative eye diseases.

A Content Analytic Approach to Assessing Triggers of Dental Anxiety
Hallie Klein (D’19) was awarded third place for this study, conducted with preceptor Dr. Joan Gluch, Div. of Community Oral Health

In her research project, Hallie developed the Dental Anxiety Triggers Scale (DATS) based on reports from Penn Dental Medicine patients and found it to be an equally good measure of dental anxiety as the most widely used dental anxiety scale, the Modified Dental Anxiety Scale. However, the DATS has the advantage of being rooted in real patient experiences, not researcher intuitions. Because the DATS provides more concrete examples of triggers, it may be useful for dental practitioners who want to be sensitive to their patients’ anxiety.

OTHER STUDENT AWARDS

2018 AADR Dentsply Sirona SCADA: Selected on Research Day to represent Penn Dental Medicine in the 2018 AADR Dentsply Sirona Student Competition for Advancing Dental Research (SCADA) program was Abby Syverson (D’19) for her research honors project titled “Lineage Specific NF-KB Inhibition in MSCs Resolves Lymphocyte Trafficking in Diabetic Fractures,” conducted with preceptor Dr. Dana Graves, Dept. of Periodontics. She will present her research at the 2018 AADR/CADR Annual Meeting in Fort Lauderdale, Fla, March 21-24, 2018

Radiology Honors: Students in the radiological sciences honors program also were recognized with awards for their joint projects — 1st place: Thomas Yoo (D’18) and Minou Luo (D’18); 2nd place: Heliya Ziai (D’17), Aaron Ivanhoe (D’17), Jon Shue (C’17) and Corey Toscano (D’17); and 3rd place: Sara Gholam (D’17) and JV Cracke (D’17).
Penn Stem Cell and Regenerative Dentistry Conference

AT PRESS TIME for this issue of the Penn Dental Medicine Journal, Penn Dental Medicine was about to host the inaugural Penn Stem Cell and Regenerative Dentistry Conference. Held October 20 – 21, the event brought together researchers and clinicians at the forefront of investigating dental stem cells and stem cell-based therapies.

The two-day program featured the state-of-the-art in dental stem cell research and the potential translational clinical applications. Along with Penn Dental Medicine faculty who are actively engaged in stem cell research, the program of speakers represented 10 other universities from across the country as well the United Kingdom and China. A poster session and junior investigator presentations supplemented the program.

Topics addressed by Penn Dental Medicine faculty highlighted key aspects of their ongoing research, including the following:

- peripheral nerve regeneration with orofacial stem cells by Dr. Anh Le (Dept. of Oral & Maxillofacial Surgery),
- bone regeneration by Dr. Shuying (Sheri) Yang (Dept. of Anatomy & Cell Biology),
- regenerative endodontic procedures by Dr. Su-min Lee (Dept. of Endodontics)
- dental stem cells in tissue regeneration by Dr. Songtao Shi (Dept. of Anatomy & Cell Biology).

Dr. Songtao Shi, Chair and Professor, Department of Anatomy & Cell Biology and one of the conference organizers, noted that dental stem cell-based therapies have been initiated in clinical trials, including for dental pulp and periodontal tissue regeneration. “Dental stem cell application represents the future of bio-dental therapies,” he says.

Other presentations and discussions ranged from stem cell therapies for autoimmune diseases, to the use of stem cells to make dentin.

The keynote address, titled “Overcoming Chromatin Barriers to Change Cell Fate,” was presented by Dr. Kenneth S. Zaret, Director of Penn’s Institute for Regenerative Medicine (IRM), which engages scientists, clinicians, and ethicists from medicine, engineering, veterinary sciences, dental medicine, and the arts and sciences.

“We are using the principles learned from the natural processes to generate new cells and tissue fragments in the laboratory and to control tissue regeneration in the body,” he says of IRM’s goal overall. “Our work is aimed to model and study human diseases, to develop new diagnostics and medicines, and, ultimately, to replace damaged, aged, or diseased body parts.”

Organizing the conference from Penn Dental Medicine were Dr. Bekir Karabucak, Chair and Associate Professor of Endodontics; Dr. Syngcuk Kim, Louis I. Grossman Professor, Department of Endodontics; and Dr. Songtao Shi, Chair and Professor, Department of Anatomy & Cell Biology.
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