

RECALL

Navigating COVID-19
while maintaining quality
student education



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College of Dentistry
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RECALL

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The University of Saskatchewan is situated on Treaty 6 Territory and the Homeland of the Métis. We pay our respect to the First Nations and Métis ancestors of this place and reaffirm our relationship with one another.



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MESSAGE FROM THE DEAN



*Dr. Doug Brothwell, Dean, College of Dentistry.
(Photo: David Stobbe)*

This past year has been full of challenges and changes for everyone across the globe.

The COVID-19 pandemic has affected every single one of us as we continue to adapt to the new normal that we are living in. The College of Dentistry has had to navigate these changing circumstances while continuing to provide the exceptional dental education to our students that we have become known for. The college is under stress both functionally and financially as a result of the ongoing pandemic, but the cost of COVID-19 doesn't affect how bright the future is for the college.

In March, the University of Saskatchewan (USask) made the decision to move to a remote educational and work environment in response to COVID-19. This was a substantial shift for the college as we had to adapt to providing

remote lectures for our students, as well as adapt to working remotely for all of our faculty and staff. USask has since made the decision that the 2020-2021 academic year would also be delivered remotely. The adaptation to providing remote educational programming and working remotely has been a learning process for the college, but one that I am proud to say we have navigated quite successfully.

We have been successful in implementing numerous new protocols and initiatives in response to COVID-19 including: increased infection control protocols, changes to our educational programming to adapt to a primarily virtual environment, and a digital approach to student supervision. The college continues to be flexible and implement and adapt these changes as more information about COVID-19 becomes available and are confident that COVID-19 has not had a negative impact on the education that we provide to our students and their experience.

Despite the financial pressures the college is facing, we are continuing full speed ahead with our renovation and reequipping plan for the college. In May 2020, we released a Request for Proposal to architectural firms, and we have now selected the successful firm. Barring any further COVID-19 related problems, final plans should be completed by September 2021 and construction will begin in 2022. If you'd like to learn more about the project or how you can support it, we encourage you to reach out to our Donor Relations Officer, Stacey Schewaga.

Over the past year, the college has seen significant success with our research program. Our faculty members received numerous grants for their research projects that consist of both COVID-19 related research and other important research topics such as periodontal disease, the effects of circadian clock disruption

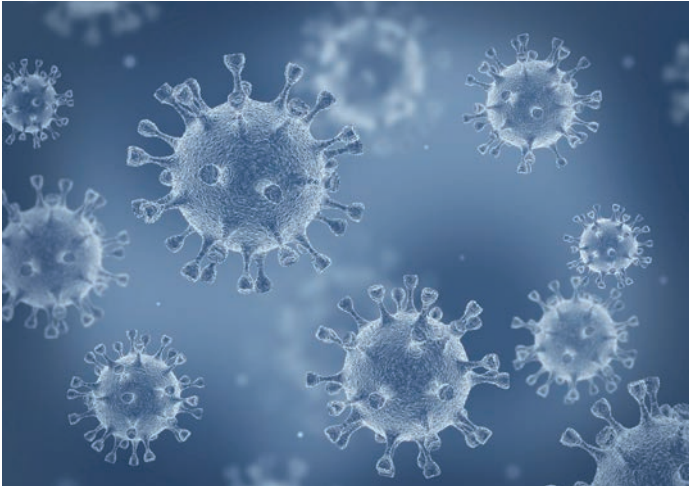
and the biochemical characteristics of canine saliva. Additionally, our Associate Dean of Research, Dr. Petros Papagerakis was recently awarded a Centennial Enhancement Chair at USask. This is the first research chair position in the history of the college and a significant accomplishment for both Dr. Papagerakis and the College of Dentistry.

As many of you are aware, one of our priorities in our seven-year Strategic Plan: Building on Strength – Improving Tomorrow is to become Canada's leader in Inclusive Community Care, and we have recently seen some exciting progress in this endeavor. The first step of our Inclusive Community Care strategy is highly focused on Indigenization and improving access to care for priority populations in Saskatchewan. To help reach this goal, at the end of September, the college opened a new outreach clinic in partnership with the Big River First Nation, and at the beginning of October the Prince Albert Campus Dental Clinic opened on the new USask Prince Albert Campus. The Prince Albert Campus Dental Clinic is another of the college's outreach clinics, but will also operate as an educational clinic as students will complete clinical rotations throughout the academic year.

This has been a year of turbulence and significant change for the college. We have faced many challenges, but also seen numerous successes. As we continue to navigate the constantly changing situation surrounding COVID-19 our priority remains to ensure the health and safety of our students, patients, faculty and staff. I thank you for your continued support of the college and its initiatives and I am hopeful and looking forward to what 2021 will bring for the college.

COLLEGE UPDATES

COVID-19 Update



The ongoing COVID-19 pandemic has caused numerous changes for everyone, and the College of Dentistry is no exception.

In a very short time frame, the entirety of USask had to reinvent the way it provided education to students across campus. For the College of Dentistry, in March this meant the closure of the on-campus clinic and completing lectures for the 2019-2020 academic year online. The college had to find a way to effectively deliver educational programming to students in a primarily virtual environment especially when the decision was made by USask that the 2020-2021 academic year would also be delivered remotely.

The college was able to gain considerable knowledge from the initial weeks of virtual course delivery in March 2020, and the Academic Office conducted a survey of students in an effort to get further insight into what worked best for students. As a result of this, the College of Dentistry is using a multi-pronged approach to virtual lectures for students. Methods currently being used include: live-stream lectures, pre-recorded lectures that allow students to view the lectures at a time of their choosing, and PowerPoint slides posted online. In addition to using a variety of methods to deliver content, all faculty in the college received online teaching skills training in the spring and summer of 2020 to prepare them for the shift to teaching remotely.

In addition to the redesign of lectures, the college has also implemented something called “Chat & Learn” sessions, which provide students the

opportunity to have conversations with the professors in a more casual environment to discuss concepts they may be having difficulty with and other lecture materials. These essentially function as online office hours. The college has also had to implement different methods for student examinations, and again are using multiple different methods, including: online exams using ExamSoft, open book examinations and assignments in lieu of exams.

The next challenge COVID-19 presented to the college was how to reopen the clinic to allow students to complete the clinical component of their education. Following guidelines and recommendations from the CDSS and the Saskatchewan Health Authority, a team at the College of Dentistry created a comprehensive COVID-19 Management Strategy, that can be viewed on the college’s website, to act as a guide for staff, faculty and students working in the clinic. The Management Strategy was created first and foremost to ensure the safety of all patients, faculty, students and staff who work in the clinic on campus and includes strict procedures to follow for aerosol-generating procedures, increased personal protective equipment protocols and guidelines and remediation processes for students.

The CDSS has stated that aerosol-generating procedures need to be completed in an enclosed operator. As a result, the college had to reinvent and make some architectural changes to the clinic to allow for enclosed operatories where students can complete this type of dental treatment. In addition to our existing 10 fully enclosed operatories, the college converted six faculty academic offices into fully enclosed operatories, and temporarily enclosed three operatories in the Oral Surgery area to meet this CDSS criteria in various locations within the dental school.

In addition to the Management Strategy, the college has changed the timing of clinics and pre-clinics to run back-to-back with just a short break in between. This prevents students and faculty from spending more time on campus than needed and eliminates the hassle of driving to and from campus multiple times in one day.

These have all been significant changes, but the college remains focused on maintaining the excellent quality of education students receive. The college continues to be flexible and is adapting to the rapidly changing environment to ensure the safety of patients, students, faculty and staff.

Clinical Supervision During COVID-19

Under current CDSS guidelines, “high-risk” aerosol-generating procedures need to be completed in an enclosed operator, which has presented unique challenges for the college as students need to be supervised while doing these procedures.

It is impractical for the college to have one clinical supervisor in each of the enclosed operatories for the entire procedure, as well as to have the supervisor repeatedly donning and doffing personal protective equipment to move between enclosed operatories. Additionally, having a supervisor enter an enclosed operator during a procedure defeats the purpose of using an enclosed space, as the door would be continually opening and closing.

In response to these challenges, the College of Dentistry has decided to pilot a remote audio-visual supervision strategy. This strategy will see two enclosed operatories equipped with a microphone and speaker for audio communication, and two cameras; a webcam mounted in such a way as to provide an overall view of the patients and students, and an intra-oral camera with which the student-operator can provide high resolution, close-up views of the tooth being restored. With this equipment in place, a clinical supervisor will be able to provide remote instruction and evaluate the progress and quality of care being provided by students, as well as be aware if a situation arises that requires them to enter the operator.

The end goal for this remote audio-visual supervision strategy is that the clinical supervisor will only need to enter the enclosed operator once, and that this will preferably take place at the end of the procedure to evaluate the final result.

While the college is still at the beginning of this pilot project, it promises to be an innovative and novel way to effectively, efficiently and most importantly, safely provide students with the supervision and support required for conducting aerosol-generating procedures during COVID-19.



Dental Assisting Program Update



KELLIE GLASS (MBA, RDH) ASSISTANT DEAN, DENTAL ASSISTING PROGRAM

What an exceptional time it has been within the Dental Assisting Program at the University of Saskatchewan.

COVID-19 has definitely changed our world, but I am so thrilled that we continue to provide high quality education and experiences to our dental assisting students at the College of Dentistry.

Our 2019-20 cohort had their program interrupted in March, with preclinical and clinical experience put on hold with the university campus closed. Our faculty quickly responded to provide didactic coursework remotely, and offered “Chat & Learn” sessions until June, to allow students to continue learning and keeping their knowledge fresh. In August, we were thankfully able to welcome these students back to the College to complete their preclinical and clinical requirements, with their practicum experiences taking place in September. These 30 students wrote the National Dental Assisting Examination at the beginning of October and will be convocating in November with other USask graduates. We are so proud of this cohort and our DA program. We are confident that these graduates will be joining your dental teams as safe, competent oral health professionals.

In August, we were also thrilled to welcome a new cohort of 40 dental assisting students in to the College of Dentistry. We continue to evaluate the DA program and make improvements where possible. An increase from 30 to 40 students was made to continue to address the chronic shortage of dental assistants in Saskatchewan. As well, increased integration between the DA and DMD programs remains a significant priority. An earlier start to the DA program as well as revisions to front-load core dental assisting knowledge and skills occurred this year. The College of Dentistry provides a unique and exceptionally valuable experience for both DA and DMD students, in that these students have an opportunity to work alongside each other providing dental services together in the patient care clinics. The 2020-21 cohort have been in these clinics earlier and for significantly more hours per week than in past years. This produces more experienced and knowledgeable practitioners – both dental assistants and dentists joining your practice.

A strong relationship between the DA Program, College of Dentistry and dental practices is extremely important to us. Please don't hesitate to reach out to me anytime, and consider being a practicum office for our dental assisting students this coming year. I can be contacted at kellie.glass@usask.ca.

Bachelor of Science in Dentistry

 DR. KEITH DA SILVA (DDS, MSC, FRCD(C)), ASSISTANT PROFESSOR



From L to R: Rhys Herman, Serena Liu, Ashlyn Schwab, Katie Hu
Photo was taken prior to COVID-19

The Bachelor of Science (B.Sc.) in Dentistry program was established in 2019 to motivate and encourage students enrolled in the DMD program to become involved in oral health related research.

In this intensive and immersive two-year program, students spend consecutive summer terms developing skills in research design and methodology, including experimental design, hypothesis testing, critical evaluation of data, and effective communication. The curriculum is designed to be flexible to accommodate the diversity of projects, while fostering interest in research career paths and providing a competitive advantage to students applying to specialty graduate programs.

With the expansion of the College of Dentistry's research capacity, B.Sc. students have the opportunity to work with faculty supervisors from a variety of disciplines covering the basic sciences, biomaterials, clinical dentistry, and population health. Currently, there are nine students enrolled in the program, with the first cohort on pace to complete their

core requirements, including the submission of an original manuscript to a peer-reviewed journal, this fall. These novel projects include investigations into:

- Mouth guard use during resistance training - Rhys Herman (Drs. Amrinderbir Singh/Doug Brothwell)
- Sugar sweetened beverage reduction strategies for Northern communities - Serena Liu (Dr. Keith Da Silva)
- The experiences of the 2SLGBTQ+ population while accessing healthcare services - Ashlyn Schwab (Drs. Abbas Jessani/Keith Da Silva)
- The barriers to accessing oral health care for children with fetal alcohol spectrum disorder - Katie Hu (Dr. Keith Da Silva)

As we reflect on the first two years of the program, we are proud of our students for their enthusiasm, engagement, and the hard work they have put into their research, particularly considering the significant changes to research activity and campus access in response to COVID-19. While local and National research competitions will look very different over the next year, we look forward to our students representing the College of Dentistry as they showcase their work.

Digital Dentistry at the College of Dentistry

 **DR. AHMED HUSSAIN (DDS, PHD), ASSISTANT PROFESSOR**

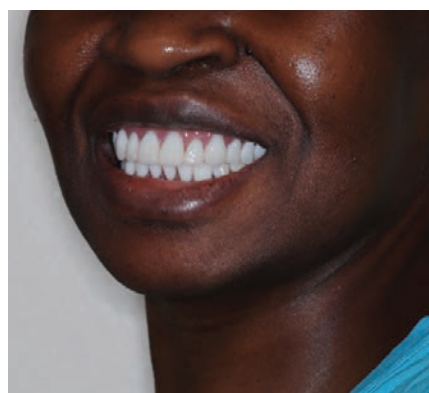
Dr. Ahmed Hussain (DDS, PhD) is an assistant professor and a prosthodontic course coordinator at the College of Dentistry. He has been an integral part of introducing digital technology into the dental curriculum at the college.

In the last few years, the College of Dentistry has accelerated its initiatives to modernize the student clinical and didactic experience. One of these initiatives is the development of a digital curriculum in Prosthodontics (Fixed and Removable).

Our aim is to ensure our students are ready for the future. We want them to be able to use currently available and emerging technologies with ease. In other words, the College needs to be active in the frontiers of medical/ dental development. For example, intra oral scanners are getting more popular in dental practices. I believe in 5-10 years we will see that most, if not all, dental practices in Canada will engage in some shape or form with digital dentistry.

Last year (2019) the college started to implement the use of digital dentistry in Removable Prosthodontics, and our students were excited to deliver their first digital complete denture. In addition, digital technology helped us treat some challenging clinical cases that would have been difficult to treat using conventional techniques. Consistent with our new emphasis on research, one of the cases is in the writing process for publication in the near future. For this coming academic year, digital technology will play a large part in the Year-4 Fixed Prosthodontic course. The revamping of the Year-4 course has helped us to introduce digital technology in a structured way to better help our students understand basic digital dentistry principles related to intra oral scanners, bite registration techniques, and different CAD/CAM techniques.

These changes would not have been possible without the help, support and understanding of the Dean of the College of Dentistry, Dr. Doug Brothwell. His vision of placing the College of Dentistry amongst the top dental colleges in Canada has inspired us to do our best to be part of that vision.



New Faculty at the College of Dentistry

The College of Dentistry is pleased to welcome the following new faculty members.



Dr. Zuzanna Apel, DMD
Assistant Professor, Group Practice Leader

Dr. Apel is an assistant professor and coordinator for Operative Dentistry. She is also teaching year-four students in comprehensive care clinics. After obtaining her bachelor degree in dentistry at Jagiellonian University, Krakow Poland, Dr. Apel earned her DMD degree with Great Distinction in 2002 from University of Saskatchewan and received numerous scholastic awards during her studies. That year she also completed her externship at the Saint Louis University in Periodontics and Implantology. She holds dental licenses in both Canada and the US. For the last 18 years she has worked in private dental offices as an associate dentist and owner of a dental practice. Dr. Apel also worked as a part time clinical instructor at University of Alberta where she is currently pursuing her Master degree in Education in Health Sciences. Her research interests are in simulation methods and teaching methodologies in dental education. Dr. Apel has joined the College of Dentistry to further pursue her academic career.



Dr. Diego Ardenghi, DDS, MA (Educ), MSc, DIP. Pros, FRCD (C)
Assistant Professor, Prosthodontics

Dr. Ardenghi is an Assistant Professor in Prosthodontics in the College of Dentistry, University of Saskatchewan. He joined USask after working as the Director of Prosthodontics at the University of Florida, Acting Associate Dean Academic at USask, and Clinical Assistant Professor at the University California San Francisco. In addition, Dr. Ardenghi had worked as the Assistant Secretary of the International Dental Ethics and Law Society, a society that was established to foster an international dialogue on the values guiding the practice of oral health care.

Dr. Ardenghi earned his Dental degree from the Federal University of Santa Maria, RS, Brazil. His Master of Arts in Education in Curriculum Studies is from the University of Victoria, British Columbia, Canada and his Master of Craniofacial Sciences and Clinical Specialization in Prosthodontics from the University of British Columbia, Vancouver, Canada. Diego is a Board-Certified Prosthodontist and Fellow of the Royal College of Dentists of Canada. He has several publications and has spoken nationally and internationally in several dental meetings, congress, conferences and CE courses. He also works as an invited consultant (reviewer) for several respectable international journals.

Dr. Ardenghi is one of the few clinician dentist educators who have a formal graduate training (Master of Arts) in curriculum studies where he became intimately familiar with curriculum design for dental education. His main research areas are in the field of Teaching Methodologies, Student Learning, Qualitative Research, Dental materials and Synchrotron imaging including veneers and CAD/CAM dentistry, Access to Dental Care Services, and Prosthodontics 3D Printing.



Theresa Donald, RDA
Instructor, Dental Assisting Program

Terrie graduated from the Kelsey Institute Dental Assisting Program in 1985. She served as a board member for The Saskatchewan Dental Assistants Association from 1986 through 1990. Over the course of her career, she has been employed in a variety of roles in dentistry including sales, automation of offices and extensive chairside experience. Theresa is also an instructor with the Red Cross teaching First Aid, CPR, Babysitting and Psychological First Aid. During her 35 years assisting career she has mentored many dental assisting students.



Dr. Renata Grazziotin, DDS, MSc, PhD
Assistant Professor, Endodontics

Dr. Grazziotin is Assistant Professor at the College of Dentistry. She joined USask in 2017 to work in the discipline of endodontics. In 2019 she moved to the US to join University of Florida operative dentistry as a resident. Her passion for USask made her come back to the college in 2020 to coordinate an endodontics course and to share knowledge in operative dentistry. Dr. Grazziotin is also proud to have worked as a post-doctoral fellow (dental education) at the University of California San Francisco-UCSF in 2015-2016; and as a research fellow (dental materials) at Cardiff University U.K. in 2011-2012. Dr. Grazziotin is originally from Brazil where she worked in the academic field for more than 10 years (including being a tenured-professor at the Federal University of Rio Grande do Sul UFRGS). She earned her degrees in Brazil: DDS (Federal University of Santa Maria- UFSM, 2001); Diploma in Endodontics (Brazilian Society of Dental Surgeons- Sobradid, 2006); MSc Endodontics (Lutheran University of Brazil-ULBRA, 2008); and PhD Endodontics (Lutheran University of Brazil-ULBRA, 2012). Dr. Grazziotin's teaching responsibilities and research interests include synchrotron images for dentistry, dental materials, inter-relation endodontics-restorative dentistry and dental education – working mainly with confidence and visual methods.



Dr. Sheri McKinstry, BSc, DMD, BSc (Dent), MPH, M.Dent, FRCD(C) -Provisional
Assistant Professor, Pediatric Dentistry

Wabishki mitadim ojichidaa ikwe / Dr. McKinstry is Anishinaabekwe from Treaty 1 territory, and proud member of Sagkeeng First Nation in Manitoba. She is married with four children and is honoured to live and work on Treaty 6 territory. She is an assistant professor in the College of Dentistry at the University of Saskatchewan. She is looking forward to sharing her professional and personal lived experience with the University of Saskatchewan, especially the College of Dentistry. Dr. McKinstry completed a Bachelor of Science at the University of Manitoba in 2001; and went on to attain a Bachelor of Science in Dentistry and a Doctor of Dental Medicine in 2005, also from the University of Manitoba. Upon graduation from dental school, she provided dental care in First Nation communities for over a decade until she left to specialize in pediatric dentistry. During this time, Dr. McKinstry started a Bachelor of Arts in Native Studies and obtained a Master of Public Health in 2017, specifically in Indigenous Peoples' Health from the University of Victoria. Here, her area of focus was in Reconciliation and Cultural Safety in Dentistry. Recently she completed the Master of Dentistry / Pediatric Dentistry Residency program at the University of Manitoba, where her research focus was on the oral health experience of First Nations children. Her goal is to use her knowledge and expertise to benefit First Nation children and communities while transitioning into an academic and research career. Dr. McKinstry is a provisional Fellow of the Royal College of Dentists of Canada in pediatric dentistry.



Dr. Tyler Phanuef, BSc, DMD
Assistant Professor, Endodontics

Originally from Maymont, Saskatchewan, Tyler completed a BSc in Anatomy and Cell Biology at the University of Saskatchewan and was a member of the University of Saskatchewan College of Dentistry class of 2014. Tyler practiced family dentistry in Regina for three years before returning to grad school at the University of Toronto to complete a three-year residency in endodontics. Current professional memberships include fellowship in the Royal College of Dentists of Canada (FRCD(C)), American Academy of Endodontists, Canadian Academy of Endodontists, College of Dental Surgeons of Saskatchewan, and Regina & District Dental Society.

We are additionally pleased to congratulate two existing faculty members to new appointments:



Dr. Walter Siqueira, DDS, PhD,
as Associate Dean, Academic



Kellie Glass, RDH, MBA,
as Assistant Dean, Dental Assisting Program

RESEARCH UPDATE

Dr. Petros Papagerakis receives first ever College of Dentistry research chair

 JENNA FRASER, COMMUNICATIONS OFFICER

Dr. Petros Papagerakis (DDS, BSc, MSc, PhD) joined the College of Dentistry in 2016 as the Associate Dean, Research and on July 1, 2020 was awarded a Centennial Enhancement Chair in One Health at the University of Saskatchewan (USask).

Papagerakis' research firmly embodies the One Health signature research area, with its wider scope encompassing oral and systemic health and the mechanisms and influence of circadian clock regulation and environmental cues on health, his work in this area has the potential to cross many different disciplines. There is growing evidence that circadian clock dysregulation is a contributor to a variety of disorders and can impact many facets of well-being for humans, animals and plants.

"Dr. Papagerakis is a national and internationally recognized researcher. He has played an integral part in establishing us as a research-intensive college," said Dr. Doug Brothwell, Dean, College of Dentistry. "His appointment as associate dean, research, has led to the recruitment of several additional internationally recognized researchers. Receiving the first research chair position for the college, is an honour befitting his performance, status, and contributions to the research environment in the College of Dentistry and in USask."

Papagerakis has been awarded several grants as Principal Investigator, including funding from NIH, SHRF Establishment,

RUHF, International Innovation Award funded by GSK pharmaceuticals, a NSERC Discovery grant, and a Canadian Foundation for Innovation infrastructure grant, which is unprecedented for the college. Additionally, he is co-investigator on several grants, including American Cancer Society, SHRF Establishment, CIHR-SCPOR. All together, these grants total over \$2 million in funding for Papagerakis' research.

In addition to his research, Papagerakis is also an accomplished mentor who encourages higher-order thinking and leadership skills as he fosters a training environment that embraces diversity, encourages inclusivity, and develops a strong sense of community. Papagerakis has recruited and supervised students, many who are co-supervised, from various USask programs including; Toxicology, Biomedical Engineering, Anatomy/Physiology/Pharmacology, Pharmacy and Nutrition, to name a few. This interdisciplinary learning environment is unique and provides opportunities for collaboration for students and faculty across campus. His students at USask have received more than 40 local, national and international awards and scholarships.

Papagerakis continues to promote internationalization for USask. He has established international collaborations with researchers in countries around the world. With his personal connections and previous collaborations with Peking University, he was a member of a USask delegation that travelled to China and he returned with a signed an MOU with Peking University, a top-ranked university in China and worldwide.



Dr. Petros Papagerakis receives the College of Dentistry's first Centennial Enhancement Chair.

(Photo: David Stobbe)

"This is the first ever research chair position that the College of Dentistry has ever been awarded. As such it represents a hallmark in the history of our college and highlights a significant change of directions promoting innovative dental research and evidence-based high-quality dental education," said Papagerakis. "This chair position will also allow my lab to recruit more graduate students enriching the pool of top-notch candidates for our PhD program attracting scientists from different fields and dentists with prospective dental academic careers in the field or Precision Oral Health and Chronobiology. I am very grateful for the college's and USask's trust and support."

College of Dentistry researchers received NSERC grant

Dr. Walter Siqueira (DDS, PhD), Full Professor and Associate Dean, Academic, and Dr. Petros Papagerakis (DDS, BSc, MSc, PhD), Associate Dean, Research, each received a NSERC grant for their respective research projects.

Understanding the Biochemical Characteristics of Canine Saliva – Dr. Walter Siqueira

Saliva plays an important role in the regulation of oral homeostasis in most vertebrates, however, very little studies have been conducted to investigate the salivary composition of different species of mammals. While the proteome exploration in cells, secretions and tissues of farm animals has increased exponentially in veterinary science, very little investigation has been made into companion animals, like dogs.

Dog saliva is very poorly studied in terms of composition, physiology and biochemistry, however, based on the little that is known, we can highlight significant differences between human and dog saliva. This lack of attention to the critical variations between human and dog saliva may partially explain why the use of therapeutics developed based on human saliva are not efficient in dogs.

Dr. Walter Siqueira's research program to further explore the characteristics of dog saliva is unique in Canada. "Among diseases that affect dogs, dental tartar and periodontitis are the most common. And the main protection against these diseases are salivary components," explains Siqueira.



From L to R: Dr. Petros Papagerakis and Dr. Walter Siqueira. Photo was taken prior to COVID-19. (Photo: David Stobbe)

The short-term goal of Siqueira's research is to understand the biochemistry of dog saliva, which he plans to do by collecting saliva from dogs and subjecting it to proteomic and peptidomic analysis. The long-term goal is to use these findings to understand the formation of dental tartar and periodontal disease in dogs.

"I believe that the overall outcome of this research has the potential to open novel avenues of investigations relevant to veterinary sciences by identifying biomarkers for oral and systemic diseases in dogs," Said Siqueira. "These findings will have significant appeal to pet-private sector, as veterinary care, including

oral health care, for dogs, can be quite expensive for pet owners, and understanding these diseases in dogs is the first step in developing appropriate and cost-effective therapeutics for the animals."

The circadian clock control of enamel formation: its role and regulatory links to the store operated Ca²⁺ entry – Dr. Petros Papagerakis

The circadian clock system is present in the brain and many peripheral tissues regulating the timing of most of our biological functions. It is responsible for producing 24-hour rhythms in gene and protein expression as well as

coordinating the temporal organization of molecular pathways, cells and tissues.

The differentiation stage is when a cell becomes specialized, when it decides what type of cell it will be. Ameloblasts are the cells that form dental enamel, and it is known that circadian clock genes are highly expressed in these cells, however, the exact role of circadian clock genes in ameloblast differentiation remains unstudied.

In addition to the circadian clock, ameloblast differentiation is also largely dependent upon the intracellular calcium signaling (iCa^{2+}). This channel allows calcium into cells that binds to protein structures and turns on a specific cellular function. That said, how iCa^{2+} regulates ameloblast specific genes remains unclear.

The role of the circadian clock and iCa^{2+} in ameloblast differentiation are the focus of Dr.

Papagerakis' research. His most recent studies show a direct relationship between circadian clock and iCa^{2+} signaling in ameloblasts. In this new research project, Papagerakis will explore two hypotheses: that circadian clock genes control ameloblast differentiation and function by modulating gene expression in 24-hour cycles, and that the circadian clock plays a key role of internal control modulating iCa^{2+} . These studies will provide foundation to understand the genetic and environmental cues affecting dental enamel and to design innovative therapeutic approaches.

This project also exams the store-operated calcium entry (SOCE), which is an important process in a variety of cellular functions including gene expression, regulation and proliferation. By examining SOCE there are two long-term clinical aims. The first is to understand the phenotype-genotype links in place in genetic disease that affect dental enamel where the SOCE

mechanisms are disrupted, and the second is to use this knowledge to promote stem cell differentiation and dental enamel production in the lab to generate bio-enamel for dental applications. This project, in synergy with Papagerakis' other project funded by SHRF, one day would lay foundation for regrowing missing or damaged tooth parts.

This study is a first step not only in understanding the role the circadian clock plays in ameloblast differentiation, but also in how the circadian clock controls cell functions. "This project fits within the new area of Precision Oral Health and Chronobiology, a new niche that supports personalized diagnosis and treatment for each patient," said Papagerakis. "This is extremely important because the previous concept of one-size-fits-all approach has major limitations and personalized medicine is expected to bring better outcomes to patients while lowering health costs."

College of Dentistry PhD Program

In September 2020, the College of Dentistry officially launched its first ever PhD program in Precision and Oral Health. This is a unique PhD program where students will be able to integrate oral and systemic health as they explore the body-to-mouth connection.

A key focus of this program will be to help students develop a sense of social responsibility by understanding how laboratorial and clinical research must influence the directions of our society.

The program attracts students from a variety of different disciplines, not just those who have graduated from a dental college. As a result, research topics are expected to range across the spectrum of biomedical, precision health, public health, public policy, Indigenous and priority population health, and bioengineering, while remaining connected to oral health.

The program is expected to admit seven students per year, growing to 28 students after four years.

Research team receives SHRF grant to study periodontal disease

 JENNA FRASER, COMMUNICATIONS OFFICER



From L to R: Dr. Walter Siqueira, Christine Downing, Dr. Francisco Otero-Cagide members of the research team studying periodontal disease. Photo was taken prior to COVID-19. (Photo: Jenna Fraser)

Dr. Walter L. Siqueira, along with Dr. Francisco Otero-Cagide and Christine Downing have been awarded a SHRF grant in the amount of \$120,000 to study a novel way of diagnosing periodontal disease activity.

The project was entered in the 2020-2021 SHRF Grant Competition and ranked as the top project in the competition.

The research team, consisting of Siqueira, Otero-Cagide and Downing, along with Dr. Lina Marin and Dr. Janet Hill, has support from the regulating bodies in the dental community in Saskatchewan, including the College of Dental Surgeons of Saskatchewan, Saskatchewan Dental Assistants' Association, Saskatchewan Dental Hygienists Association, and Saskatchewan Dental Therapists Association.

"Periodontitis is one of the most common chronic diseases in adults. In Canada, it affects 21% of this population in general and 43% of the First Nations population shows signs of the disease." Said Otero-Cagide, associate professor. "Given the prevalence of this disease in the Canadian population and worldwide, there is an urgent need to better understand periodontitis and develop a method to diagnose periodontitis based on the activity of the disease."

"Histatin is a peptide found in saliva that has antifungal properties. Our preliminary data shows that the kinetic degradation of histatin differs between healthy groups and groups with periodontitis." Explains Siqueira, professor and associate dean academic. "We believe that by examining the degradation rate and mode of histatin in saliva, we may be able to create a novel approach to contribute to improved diagnostic accuracy of the disease."

The research team believes that examining salivary enzymes, specifically histatin, is the first step to developing a diagnostic method for identifying active periodontitis.

"While the goal of our research is to develop a novel way to diagnose periodontitis, we also plan to provide clinicians with a way to provide better care to patients." Said Downing, an instructor in the Dental Assisting program. "The results of our research will be able to assist clinicians during the decision-making process and allow them to provide a patient-oriented management plan for periodontal disease."

"One of the most exciting parts of this research project is our new collaboration." Said Siqueira. "For the first time in the college we are seeing a partnership between clinicians and clinician-scientists. This partnership is allowing a high knowledge translation as we take our research discoveries and implement them directly in a clinical setting. It reaffirms our college's commitment not only to providing a high standard of clinical teaching, but also our expanding research capacity."

Dr. Walter Siqueira receives two CIHR grants

 JENNA FRASER, COMMUNICATIONS OFFICER



*Dr. Walter Siqueira receives two CIHR grants.
(Photo: David Stobbe).*

Dr. Walter Siqueira (DDS, PhD), Full Professor and Associate Dean, Academic, in the College of Dentistry at the University of Saskatchewan (USask) has been awarded two CIHR operating grants with collaborators from other Canadian universities. These grants come through the COVID-19 Rapid Research Competition.

The first grant is for the research project Development of SARS-CoV-2 Peptide Therapeutics and Point-of-Care Salivary Diagnostics for Rapid Viral Detection. Siqueira will collaborate with Dr. Mohan Babu out of the University of Regina as they develop and test SARS-CoV-2 therapeutics and prototype convenient point-of-care COVID-19 diagnostics.

Siqueira will be responsible for the diagnostic component of the research project. Siqueira leads the Salivary Proteomics Research Laboratory, and he is one of only a few in the world in this area of applied salivary research.

Siqueira will be developing new diagnostic solutions for the effective detection of even mild or asymptomatic SARS-CoV-2 carriers. These diagnostic solutions will detect SARS-CoV-2 peptides from patient saliva. By using saliva as a diagnostic fluid, testing for COVID-19 will be less invasive and allow the population to take the test in their own home or in remote locations. To conduct this research, Siqueira and his collaborator have agreements in place with the Saskatoon Health Authority and University Hospital to provide samples.

Siqueira's second project that was funded through CIHR, COVID-19 incidence rates among Canadian dentists as they return to work: a cohort study, is a collaboration with Drs. Sreenath Madathil and Paul Allison out of McGill University.

At the beginning of the COVID-19 outbreak, dental regulatory authorities encouraged the closure of dental offices across Canada. Now that dental offices are starting to reopen their doors as provincial guidelines allow, it has become apparent that the guidelines on infection control, treatment, and other procedures as dentists return to work have minimal evidence to support them.

Between the close contact between dentists and patients and the use of aerosol-generating procedures, dental offices have a potentially high risk of SARS-CoV-2 cross-infection between dentists and patients. Siqueira and his collaborators identified this risk and believe it to be crucial to monitor the incidence rates among dentists going forward.

"By monitoring the incident rate amongst Canadian dentists, we will be able to see a clearer picture of the risk level in dental offices, what personal protective equipment is required, and the effectiveness of the infection control measures in place." Said Siqueira. "Policymakers will be able to use the information we collect to create and adapt the organization of oral health care on an ongoing basis as we navigate the reopening of dental offices during the COVID-19 pandemic."

Siqueira and his collaborators will be using their network of dentists across Canada to collect monthly samples. The researchers will mail a sample collection kit to participating dentists, who will provide a saliva sample, and mail it back. This will allow for an ongoing, time sensitive collection of data.

Professors awarded grant to develop evidence-based COVID-19 clinical practice guidelines

 JENNA FRASER, COMMUNICATIONS OFFICER



From L to R: Dr. Keith Da Silva and Dr. Walter Siqueira.

Dr. Keith Da Silva (DDS, MSc), assistant professor and Dr. Walter Siqueira (DDS, PhD), professor and associate dean academic, were awarded a Saskatchewan Health Research Foundation (SHRF) grant to support oral healthcare in Saskatchewan by developing evidence-based clinical practice guidelines to minimize the risk of COVID-19 transmission during dental treatment.

Given the novelty of the SARS-CoV-2 virus, there currently isn't universally accepted guidelines on the changes that will be required in dentistry to minimize the risk of virus transmission via aerosol-generating dental procedures. As dental practices are reopening, more information is needed in order to protect the safety of patients and oral healthcare workers. Da Silva and Siqueira aim to provide that to oral healthcare workers by reviewing and consolidating the best available evidence and quickly and efficiently disseminating the resulting recommendations.

Da Silva said of the project, "On almost a daily basis, we are seeing new guidelines, and/or recommendations being put forth on how to safely resume dental care across the globe during COVID-19 pandemic. I think now more than ever, there is a need for a resource where this new information can be rapidly appraised in real-time and be made accessible to regulatory authorities and dental clinicians."

ANNOUNCEMENTS / CELEBRATIONS



Dr. Alan Heinrichs receives Provost College Award for Outstanding Teaching

Dr. Alan Heinrichs, Assistant Dean, Clinics, was the 2019/2020 recipient of the Provost's College Award for Outstanding Teaching in the College of Dentistry.

Heinrichs joined the College of Dentistry in 2011 after retiring from private practice. He has been an invaluable member of the college from that time, winning numerous teaching awards and helping the college move forward in its method of clinical education. Heinrichs took some time out of his busy schedule to sit down and answer some questions about his teaching experience and what this award means to him.

What brought you to teaching at the College of Dentistry?

Dr. Heinrichs: After I retired from private practice, I thought that I was finished with dentistry and ready to move on to a new chapter in my life. As a testament to how little I knew about myself, I found that in a very short period of time I was missing what I knew and after reflecting on what I liked and didn't like; what I missed and didn't miss about dentistry, I came to the conclusion that, although the prospect seemed initially scary, I really wanted to teach and mentor students of the profession.

What is your teaching philosophy?

Dr. Heinrichs: When I accepted a teaching position at the college, I spent some time thinking about what I thought the educational experience should be for students and

committed myself to a set of guiding principles to follow during my time as an instructor and mentor. First, interactions with students should focus on the student; I will ask what the student needs from me to help them succeed. Each student is different, and as such, learns in a different way, my approach when interacting with students needs to be tailored to what they will find helpful or effective.

Second, with respect to evaluation, it is important to students that they achieve a passing grade, but I have found, in the clinical setting, the grade is not the most important aspect. What students appreciate most is feedback, they want to know how they can improve. It is my goal that every student receives specific feedback regarding what they did well or what they can do to improve in each clinical session.

I believe that the best way to gain respect is to give it, and the best method to teach how a professional behaves is to model it, especially in stressful or difficult circumstances. Finally, it is of the utmost importance to love what you are doing. Students recognize and respond to an instructor who demonstrates passion for the subject matter and displays a genuine interest in their success.

Receiving the Provost's College Award for Outstanding Teaching is a testament to your teaching, what does it mean to you to receive this award?

Dr. Heinrichs: First of all, it is a great honour. Over my time at the College, as I have come to know and respect the members of the

Faculty, it is a very humbling experience to be recognized in this way, appreciating the quality and expertise of the group from which I was chosen. Second, it is a strong affirmation that the choice I made to transition from practitioner to professor was the right choice for me at the right time in my career.

Throughout your time with dentistry students, what is one of the most important lessons you try to teach them?

Dr. Heinrichs: The key lesson to learn, in my opinion, is to truly put the needs of the patient first. In dental school there are procedures to learn and perform and requirements to satisfy. In dental practice there is a business to run and bills to pay. The one thing that is central to everything we do in dentistry is the patient and their dental concerns. It requires a high level of trust for a patient to put themselves in the hands of a dentist and that must be respected above all else.

You've been with the college for quite a few years now, do you have any favourite memories from your time at the College of Dentistry?

Dr. Heinrichs: Convocation and graduation is my favorite time of year. I find it incredibly fulfilling to observe and interact with our students as they transition to becoming full-fledged members of the profession. Their optimism and excitement is palpable, infective and inspirational. I can't say that it keeps me young, but it is energizing and helps me feel younger.

Prince Albert Campus Dental Clinic Officially Opens



On October 5, 2020, the College of Dentistry officially opened the Prince Albert Campus Dental Clinic at the University of Saskatchewan Prince Albert Campus.

The clinic is a part of the college's Inclusive Community Outreach program, which aims to improve access to care for priority populations in Saskatchewan.

The clinic, originally set to open at the beginning of September, faced some setbacks with the ongoing COVID-19 pandemic. In response to changing infection prevention and control policies established by the College of Dental Surgeons of Saskatchewan (CDSS), the College of Dentistry had to make architectural changes to ensure the clinic followed these protocols and could ensure the safety of patients, students, faculty and staff.

Originally, the college had planned for the Prince Albert Campus Dental Clinic to open in stages, due to budgetary restraints. However, in 2019, the college received a donation of \$1,050,000 from dentalcorp, which ultimately allowed the college to open a fully finished, seven-chair clinic.

Dental care at the clinic will primarily be provided by dental professionals, however, the clinic also serves as an outreach site for the dental students. Senior dental students will provide dental care throughout the academic year as a part of their clinical rotation. Treatment provided by students will be supervised by licensed dental professionals.

This clinic is an exciting addition to the college's network of outreach clinics. It will improve access to care for priority populations in Northern Saskatchewan and reinforce the importance of culturally appropriate care and social responsibility for students as they rotate through the clinic and provide care to patients.



Dr. David Stark and his dog Bo.

Dr. David Stark Retires

Dr. David Stark retired from the College of Dentistry on June 30, 2020. He started with the College of Dentistry in September 1999 and worked as Clinical Instructor, Special Lecturer and Course Coordinator during his time with the college. In addition to the various committees that Dr. Stark was a part of at the college, he also organized a Therapy Dog program for students. Dr. Stark would bring in his standard poodles to spend time with students in an effort to promote student wellness and provide a stress relief for students throughout the academic year.

Dr. Stark was an important part of the College of Dentistry and will be greatly missed by faculty, staff and students. The entire college sends Dr. Stark well wishes as he begins his retirement and thanks him for his years of service to the USask College of Dentistry.



*The 2020 white coat recipients.
Photo was taken prior to COVID-19.*

Photos: David Stobbe



*Dr. Nekky Jamal (Class of 2009) delivers the keynote address.
Photo was taken prior to COVID-19.*

White Coat Ceremony 2020

On January 3, 2020, the faculty and staff of the College of Dentistry gathered with students, alumni, parents and friends to celebrate the second year DMD students and International Dental Degree Program students as they received their USask College of Dentistry White Coats and recited the Code of Professional Conduct.

The keynote speaker at the event was Dr. Nekky Jamal (Class of 2009) who delivered an empowering address.

The White Coat ceremony is an important rite of passage for College of Dentistry students and marks the time when they transition from simulation lab to clinic, from mannequin to patient.



The Face Mask Project



Michelle Knaus, Business Manager, Clinical Affairs, gives the sterilized masks to the Saskatoon Open Door Society. Photo was taken outdoors.

At the beginning of April 2020, the College of Dentistry partnered with the Saskatoon Open Door Society (SODS) on the Face Mask Project in response to the COVID-19 pandemic. This project was initiated by newcomer women at the Women's Business Hub and had the goal to create 10,000 cloth face masks to distribute to grassroots community organizations in Saskatchewan.

Once masks were finished by the volunteers sewing them, SODS brought them to the College of Dentistry, where staff

members sterilized the masks in sterilization bags that were donated by the college. This ensured that the masks were clean and kept sterilized while being distributed to minimize the transmission of COVID-19. Once the masks were sterilized, they were returned to SODS to distribute to community organizations.

By June, the project had reached its goal of creating 10,000 cloth face masks. These masks were distributed to over 30 different community organizations and several hundred were sent to help out Northern and Indigenous communities in Saskatchewan.

Inclusive Community Outreach program continues to grow

 JENNA FRASER, COMMUNICATIONS OFFICER



The College of Dentistry continues to work towards becoming Canada's leader in Inclusive Community Care as it continues to develop outreach programs and clinics across the province of Saskatchewan.

These initiatives not only improve the access to oral health care for rural and remote populations in the province, but they broaden the understanding of public health issues and provide the College of Dentistry students with the service-learning opportunities. Through working in these clinics, the students are exposed to the diverse segments of society so that they are able to come to understand the unique combined influence of physical, social, cultural, psychological and economic factors on oral health.

An important part of achieving this goal is active engagement with community partners. These partnerships allow the outreach clinics to ensure a healthy delivery

of programs. Recently, the college partnered with Big River First Nation to open its first on-reserve clinic. This clinic officially opened on September 28, 2020.

"Inclusivity is related to the care that involves ongoing participation and direction of the Indigenous peoples living in the locations where services will be or are currently provided to design the care delivery." Said Dr. Amrinderbir Singh, Director of Inclusive Community Care. "It is our pleasure to partner with the Big River First Nation as we work together to improve access to dental services and bring culturally-appropriate care closer to home for residents in the area."

With the opening of the Big River First Nation Clinic and the Prince Albert Campus Dental Clinic, the college now has six clinics serving Northern and First Nation communities in Saskatchewan.

ALUMNI SPOTLIGHT

Dr. Bob Loney: Ahead of His Time

✍ STACEY SCHEWAGA, LEADERSHIP GIVING & DONOR RELATIONS OFFICER



Dr. Loney during his time teaching at USask.

Throughout this pandemic, university faculty all over the world have had to adjust and learn how to deliver their courses to students online.

USask alumnus, Dr. Bob Loney, however, was ready almost twenty years ahead of the game! Dr. Loney, is most commonly known as a professor at Dalhousie University, but millions of people all over the world know him for his Removable Prosthodontics YouTube channel and videos. At present his channel has over 2.3 million views and over 17,000 subscribers. What started as a way to teach an interactive class, morphed into shooting demonstration videos at Dalhousie so that he could have more time helping students individually in class. It was a learning process, with the first recording being excessively long and subsequently being shortened to 15 minutes. Loney's first post to YouTube garnered over 3,000 views in only matter of weeks. Students, clinicians and educators from around the world started watching his videos. Over time Loney created his own website (<http://removpros.dentistry.dal.ca>) and added more videos to his YouTube channel shortening them to average between 3-5 minutes to make them easier to consume. Universities throughout the world now use his videos. Although he has had several offers to monetize his work for a profit, he has chosen to share his online resources for free so that all can benefit.

Loney studied at the University of Saskatchewan (USask) receiving a BSc Advanced degree in 1978, and his DMD in 1983. He completed his MS in Prosthodontics in 1987 at The University of Michigan. Loney loved every minute of dental school and realized how important it was for students to share that love of learning. The dean of the College of Dentistry at the time Loney was a student, Dr. Ernie Ambrose and professors like Dr. Wilf Cotter encouraged him to consider teaching as a career choice.



Dr. Loney lighting the Prosthodontic Olympics torch.

Shortly after completing graduate school and returning to Saskatoon, Dr. Loney heard about an upcoming teaching institute for Canadian dental educators at USask. Attendees had already been selected and because he had only just returned, he had missed the opportunity to apply. Determined to attend the conference, he offered to attend courses but not take meals and residence accommodation along with the others, so as to not add to the cost of holding the conference—he just wanted to learn ways of improving his own teaching. Ultimately Loney was able to attend after all. For him it was “a game changer.” And so began his journey of over 33 years teaching, 10 years with USask followed by 23 years at Dalhousie.

Loney never liked doing things the same, so he was motivated to change and update his course materials continually, with major overhauls occurring about every five years. During his time at USask, he created the Prosthodontics Olympics, a friendly student competition with prizes which ran for 10 years at

ALUMNI SPOTLIGHT



Dr. Loney and his wife, Elaine, enjoy spending their time doing outdoor activities, like biking.

the college. The goal of the Olympics was not just to encourage students to have fun while learning, but to also help students become faster and better at their clinical skills. Unfortunately, the Olympics at USask ended when Dr. Loney left, but he reprised them at Dalhousie University where he has run them continuously ever since. Loney now posts photos, world record times and videos of the Olympics on his website (the world record for an acceptable crown prep is now 3 minutes, 46 seconds).

Dr. Bob Loney has had a very distinguished career; a professor for 33 years during which he has held roles as division director, department chair, graduate program director and associate dean. Additionally, he has been honoured with numerous teaching awards at both USask and Dalhousie, as well as receiving a national teaching award. He was a member of the Editorial Review Board of the Journal of Prosthetic Dentistry for 13 years and has been an examiner for the National Dental Examining Board of Canada for over 27 years, presently holding appointments as Chief Examiner, (OSCE) for the last 12 years and also the Chief Examiner, National Dental Specialty Exam, for the next five years. In addition to this long list of credentials, Loney will be receiving the Canadian Dental Association Distinguished Service Award for 2020.

After 23 years of teaching at Dalhousie, Dr. Loney retired from teaching in June of 2020. He is staying busy with the National Dental Examining Board of Canada while enjoying time with his wife doing outdoor activities like biking, camping and canoeing. Loney is proud of his experience at the College of Dentistry, saying, "I feel our 5-year program was not only unique, but superior to others in North America when I was a student. It was ahead of its time. I wouldn't trade those five years for anything."

BE WHAT THE WORLD NEEDS