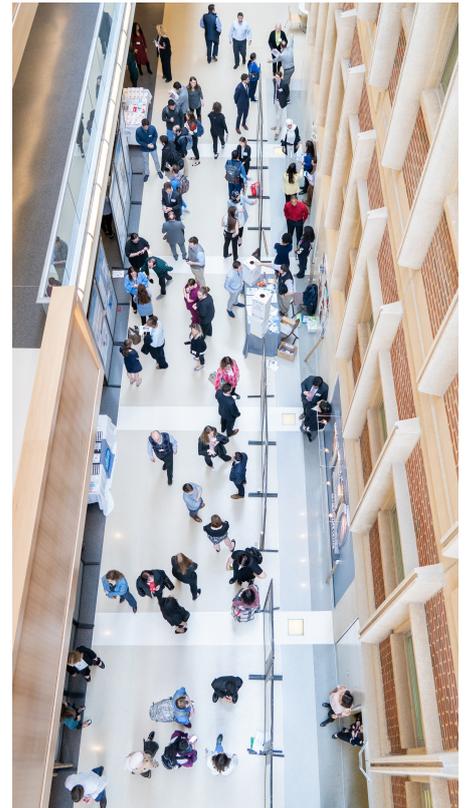


PULP NON-FICTION

UNC-CH ASOD Student Research Group Newsletter



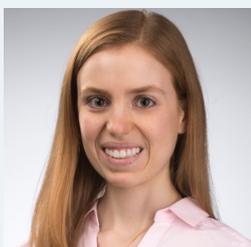
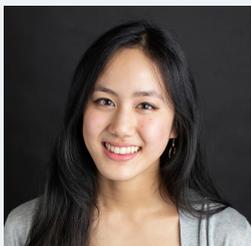
All photos were taken before the pandemic.
Remember the 3 W's - Wear, Wait, and Wash!

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LETTER FROM THE EDITORS



Hello and thank you for reading this issue of Pulp Non-Fiction! We are humbled and grateful for the opportunity to interview so many wonderful people at our school and to share their stories with you. In this newsletter, we hope that you enjoy learning about the exciting research endeavors at our school, drawing inspiration from the hard work and dedication put forth this year despite numerous challenges incited by the COVID-19 pandemic.

In producing this publication, we were touched by the various members of our UNC research community who graciously offered their time and energy to help us bring this year's edition to fruition. This effort would not have been possible without all of your support. As co-editors, it was truly an honor for us to highlight your diverse experiences in dental research.

We hope that you enjoy reading this newsletter as much as we did making it, and wish to thank you for taking part in advancing the dental profession through research!

- Sarah Liebke, Mylan Young, and Amanda Swanson

PRESIDENT'S ADDRESS

I am honored and grateful to serve as the president of our award-winning Student Research Group, and am excited to recognize the accomplishments made by all of our students and faculty! The strengths and successes of our group are driven by the amazing network of researchers we have at our school, and I look forward to continuing working with such a supportive community. I know it has been a crazy year and COVID-19 has significantly impacted the way that many students (and faculty/staff/residents) are able to conduct research, but I am also hopeful that we will use this as an opportunity to explore research in new ways. The exciting prospect of attending virtual conferences provides much easier access to a wealth of information and can help facilitate collaborations between researchers from all around the world. I am confident that we will continue to see our members make great strides in their fields and am anxious to see how our researchers and community grow. Together, we can all learn from each other to "shape the future of oral health care."

- **Mustafa Girnary, D2**



MEET THE 2021 SRG EXEC BOARD

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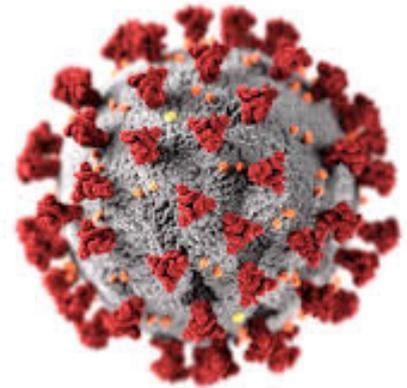
ADVANCING OUR UNDERSTANDING OF COVID-19: AN INTERVIEW WITH DR. KEVIN M. BYRD, DDS, PH.D.

by Amanda Swanson

Dr. Byrd began investigating the role of the oral cavity in COVID-19 while serving as a research instructor at the UNC Adams School of Dentistry. He has since transitioned to the role of Anthony R. Volpe Research Scholar and Oral & Craniofacial Research Manager at the ADA Science & Research Institute in Gaithersburg, MD. Working in collaboration with Dr. Blake Warner and the NIH, his team discovered the first evidence revealing the oral cavity as a primary site for COVID-19 infection. We caught up with him to learn more.

How did you get started in this area of research?

As a young faculty, I was interested in what makes up our oral tissues at a cellular level. A colleague of mine at the NIH, Dr. Blake Warner, was interested in the same question, but specifically in the minor salivary glands. We wondered if by fusing our data sets together, we could start to understand how the mouth is built in a healthy adult, and using that cell map, we could figure out if it is susceptible to getting infected by SARS-CoV-2. People had done this work in the nose, trachea, lungs, gut, and heart, but there wasn't published data for the oral cavity.



Please tell us more about your work and how it has furthered our knowledge of COVID-19.

We were trying to figure out "is the oral cavity a space that could get infected?" and "if it is infected; how badly, how often, where, and what does that mean for transmission?" It became evident that we needed to follow this to its conclusion once we found, for the first time, evidence that the minor salivary glands are infected by SARS-CoV2. So then we wondered, if the virus gets into the saliva and there's not a major clinical symptom, is this how asymptomatic spread occurs?

Looking at the autopsy specimens, we pioneered a detection method that allowed us to locate the most likely site of infection and confirm with labeled probes. We found that it wasn't just a little, but that the glands are primarily infected. We found that saliva is harboring cells (because you shed cells all the time normally) and that those shed cells can make more of the virus floating in your saliva. So it's a pipeline where the oral cavity can be infected, and then likely pass it deeper into the body or to other people.

What is the broader application of these findings?

SARS-CoV2 has illuminated that the oral cavity might have a more dynamic and underappreciated role in harboring and propagating viruses, even asymptotically. This isn't just for SARS-CoV2, but also other coronaviruses, influenza, rhinoviruses, etc.

I imagine this project has involved a great deal of interdisciplinary collaboration. Is that true?

Yes. Our team consists of oral immunologists, salivary gland specialists, oral mucosal experts, lung experts, ENT doctors, bioinformaticians, clinical trial design specialists, research volunteers, and more. It encompassed every level from basic to clinical. The incredible speed of the project was due to this interdisciplinary effort. Everyone was donating their time and talents to bring all this together, and did so generously.

What challenges have you encountered?

We wondered if we were spending time barking up the wrong tree. How could we know if this research question was worth our time? There was also a communication challenge at first because of different physical locations, but you saw how quickly everyone adapted to a virtual world. Our collaboration became so fluid that way.

Do you have any advice for students looking to get involved with research right now?

What it takes to be successful in research is to have persistence and resilience - the phenotype that many of us, especially in dental school, have to develop. It's always challenging to do anything new. You all are already, from the dental perspective, constantly being exposed to new things, and COVID has added a layer to that on top of everything else. Know that you want to do it and be okay with challenges. This is true about research in general, but especially now.

It sounds as if Dr. Byrd and his collaborators have made some pretty groundbreaking discoveries about oral infection with COVID-19. So, what is next? Data from this study will be applied toward their broader goal of establishing a comprehensive oral and craniofacial cell map as part of the Human Cell Atlas project. They aim to use this insight to further our understanding of how the oral cavity becomes infected by viruses, and what the implications are for subsequent transmission and symptom development.

STUDENT RESEARCH IN THE TIME OF COVID-19

We would like to give a special shout-out to some of our current students who have persevered through projects in the year 2020 despite facing numerous challenges from the pandemic. Keep up the great work!

Adam Hoxie, D4



"MicroCT Evaluation of Caries Activity"

We are using microtomography to evaluate the remineralization status of initial carious lesions in hopes of creating an *in vitro* gold standard for caries activity.

COVID Pivot: Fortunately we had most of our data collected before COVID, which has allowed me to focus much more on the analysis and writing portion of the project.

Colin LaPrade, D4



"Radiation dose of varying source-to-object distances for bitewing radiographs taken using a position indicating device"

Investigating the difference in radiation dose for bitewing radiographs take when a position indicating device ring is at its maximum and minimum distance away from an object being imaged.

COVID Pivot: My work has been largely unchanged. Radiation dosimetry can be performed independently and with relatively little training.

Zachary Burk, D2



"The genetic basis of developmental defects of the enamel in the primary dentition"

Identifying single nucleotide polymorphisms associated dental defects of the enamel (DDE) and estimating the genetic overlap between DDE and early childhood caries.

COVID Pivot: The processed genotype data from Johns Hopkins University was delayed. In the mean time, I have helped publicize a machine learning model developed by another student in a related project for public access.

Ian Stewart, D4



"s-IOT and Transillumination in the Detection of Proximal Caries"

Investigating the clinical utility of a new carbon nanotube enabled Stationary Intraoral Tomosynthesis x-ray machine that was invented at UNC.

COVID Pivot: We conducted an eight examiner sIOT-based diagnostic exam with faculty and residents from UNC and Texas A&M Dental schools, completely virtually. This was presented at the 2020 AAMR Annual Meeting.

Hudson Spangler, D2



"Tool for Modifying 3D Models for Communicating Tooth Surface-Level Conditions"

A web-app which translates dmfs data into a 3D model of the corresponding dentition, to aid in communication.

COVID Pivot: The extended winter break allowed me to enjoy my time programming. A full day of online class tends to make me run from my computer.

Amanda Swanson, D2



"No Wrong Door to Hypertension Control: Interprofessional Service Learning in a Dental Setting"

Creating and evaluating the impact of a pilot program for at-home hypertension management by providing education, devices, and followup support to dental patients.

COVID Pivot: Recruiting participants has been more challenging to accomplish virtually, but an added benefit is that we are now meeting face-to-face with our patients (via Zoom) instead of the original plan to use phone calls.

Kamaira Phillips, D2

"Periodontal disease, undiagnosed diabetes, and body mass index: Implications for diabetes screening by dentists"



Undiagnosed diabetes is significantly associated with obesity, edentulism, and periodontitis. These characteristics could help identify dental patients who need diabetes screening or modifications to care.

COVID Pivot: Because diabetes is a public health crisis and a comorbidity that increases risk of negative health outcomes among COVID patients, I was more dedicated than ever to publishing the results of my findings.

Mylan Young, D2

"Application of Low-Intensity Pulsed Ultrasound (LIPUS) in Dentofacial Deformity"



Low-intensity pulsed ultrasound (LIPUS) can help craniofacial skeletal muscle tissue to regenerate more quickly, which could be utilized to grow custom-fitted muscle tissues for patients with dentofacial deformities and accelerate their growth and healing process.

COVID Pivot: Thankfully, we are still able to continue our efforts in the same way despite COVID.

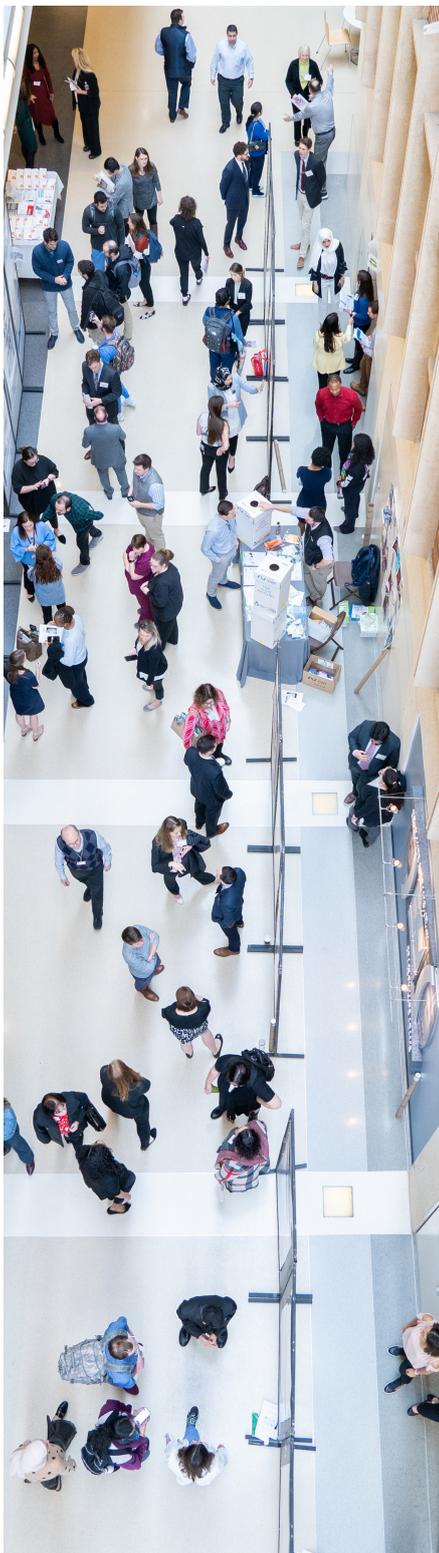
DENTAL RESEARCH DAY

The 37th annual UNC-CH Dental Research Day will take place on Wednesday, March 17, 2021. This year's Research Day will be held in a hybrid format, with virtual and select in-person events. The keynote speaker, presentations, and seminars will be virtual. Hands-on courses and the award celebration will be in person. [Abstract submissions](#) are due on February 15th, 2021.



This year's keynote address will be delivered by Dr. Rena D'Souza, the new director of the National Institute of Dental and Craniofacial Research (NIDCR). Dr. D'Souza is renowned for her research in craniofacial development, genetics, tooth development, and regenerative dental medicine. For more information about Dental Research Day, please visit the [DRD website](#).





2020 DRD AWARD WINNERS

SRG James Bawden Awards

Student: Kayla Kopczynski
Mentor: Sylvia Frazier-Bowers

SCADA Award

Mustafa Girnary

AADR Student Research Day Award

Ian Stewart

Dentsply Sirona/ADHA Graduate Student Award

Caroline McLeod

Hinman Student Research Symposium Award

Babak Yousefi

NC AADR Turner Awards

Zachary Burk
Coco Roening
Beatrice Williams
Adam Lietzan
Sing-Wai Wong
James Goglia
Lara Heimisdottir
Andrea Faust
Adele Musicant
Lauren Katz
Kshitij Sharma
Marta Musskopf

CHAPTER AWARDS

with past SRG co-presidents Sarah Liebkemann and Colin LaPrade

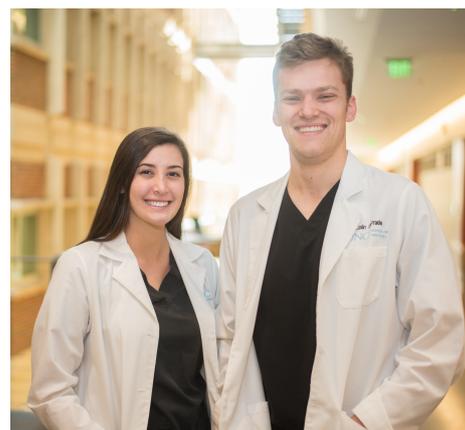
In 2020, the UNC ASoD Student Research Group was awarded the *Outstanding LSRG Advocacy Award* and the *Best LSRG Newsletter*.

"These awards are a reflection of our incredible members' voices and stories. It's an honor to be a part of such a vibrant research community," said Liebkemann.

"Our visit to Capitol Hill was one of the highlights of my experiences as a member of our LSRG's executive board, and our award-winning newsletter highlights the excellent work being done by our school's student researchers," said LaPrade. "The members of our chapter make the Adams School of Dentistry proud!"

"These awards are a reflection of our incredible members' voices and stories."

- Sarah Liebkemann and Colin LaPrade
2019-2020 SRG Co-Presidents



6 TIPS FOR STARTING A STUDENT RESEARCH PROJECT

1 Find your spark

Attend conferences, DRD, and other SRG events to get involved and learn more. Read journal articles about areas in which you are interested. Think about what you are learning in class. Which topics excite you the most?

2 Identify available mentors

- Join SRG for research connections
- Ask your favorite faculty or upperclassmen for ideas
- Read [faculty research profiles](#) on the university website
- Finding the right fit can take time, so be patient with the process

3 Approach potential mentors

Do not be afraid to reach out by asking to meet with faculty whose research you are interested in. Be polite, ask insightful questions, and thank them for their time.

4 Check out campus resources

- [The Odum Institute](#)
(resources for social research)
- [BeAM @ UNC](#)
(makerspaces for physical projects)
- [NC TraCS Institute](#)
(support for translational research)

5 Navigate the uncertainty of COVID

Even if it is not the linear path that you had originally planned, focus on what you *can* be doing to maximize this unique time (i.e. reading the literature, planning, writing, analyzing data, etc).

6 Manage time effectively

Block out space in your schedule ahead of time to help balance research involvement with studying, self-care, and other priorities. Stay focused on the goal; you will find that time flies when you are having fun!

HIGHLIGHTING KEY RESEARCH MENTORS AT UNC DENTISTRY: OUR LIFELONG LEARNERS, TEACHERS, AND LEADERS

by Mylan Young

Many wonderful faculty have taught at and expanded our UNC program here, while mentoring countless students over the years in research. They are a major driving force behind UNC being a leader in research and help many students get involved in research and accomplish their goals. We talked to a few of the key faculty mentors at UNC to hear their stories and appreciate all the work they do to help students succeed in research.

What is your area of research and why did you go into that field?

JW: Former Dean of the dental school, Dr. Jane Weintraub, DDS, MPH, says that she “caught the ‘research bug’ early” as a pre-dental student, and it’s stuck with her ever since. “In college, I studied two different populations to try to learn why one of them had lots of caries experience and the other had very little. In my current dental specialty of dental public health, much of my research still seeks to answer different aspects of this question.” After dental school, Dr. Weintraub received her Masters in Public Health from Harvard, which has aided in her current research in teledentistry, interprofessional education, silver diamine fluoride, and the oral health of older adults.

KD: Dr. Kimon Divaris, DDS, PhD cites his influence for starting research as his own mentor, Dr. Argy Polychronopoulou, who was one of the first dual-trained pediatric dentist and Ph.D. epidemiologists in Europe. As a pediatric dentist, Dr. Divaris spends most of his time “investigating the various social, behavioral, and biological determinants of children’s oral health, with focus on early childhood caries.” He is conducting a community-based study of early childhood oral health in NC, which will advance our knowledge in the new field of precision oral health and dentistry.

TW: Recently selected as the next editor in chief of the Journal of the American Dental Association (JADA), Dr. Tim Wright, DDS, MS describes his journey as more unique and less linear. As a dental student, he didn’t do any research but after graduating, he decided to pursue a master’s degree in a cariology research program. During his fourth year, he began “seeing these really interesting patients, a lot of whom had genetic conditions like amelogenesis imperfecta or craniofacial anomalies.” At that time, there wasn’t much of a tie between genetics and caries, so Dr. Wright decided to delve in and learn more by completing a genetics fellowship and later receiving his board certification in pediatrics. Dr. Wright continues to conduct research and make new discoveries in both the genetics and pediatric clinical fields.



Dr. Kimon Divaris
DDS, PhD



Dr. Jane Weintraub
DDS, MPH



Dr. John Tim Wright
DDS, MS

What are some of your best or proudest memories in research?

KD: “Well, every day is ‘special’ in research, or at least I try to approach it that way,” says Dr. Divaris. Nevertheless, he recalls the most memorable moments as his first published paper, which was on dental students’ stressors in the *Journal of Dental Education*, and his first NIH grant to conduct the first “Genome-wide association study of Early Childhood Caries”.

TW: Dr. Wright has made multiple discoveries in both the genetics and the clinical fields. These include helping develop a new classification for craniofacial anomalies and ectodermal dysplasias, coming up with a new way of getting sealants to adhere to hypomineralized teeth, and discovering several genes involved in tooth formation syndromes, such as tricho-dento-osseous syndrome.

“I think probably one of the coolest things is being able to go to a patient and say ‘this is what you have, and this is what we can do about it’, and having an insight that most people didn’t have because I understood the research,” Dr. Wright says. “My clinics are pretty interesting because it’s an alphabet soup of syndromes; making dentures for three-year-old kids, bonding or crowning people with bad enamel that has aesthetic issues and their teeth are hypersensitive. It’s my research that got me to be able to do that and do it as well as I can. It’s like the mastercard priceless moment when I put a smile on a kid and I know that I know how to do that par excellence because of the road that I followed.”

JW: Dr. Weintraub cites one of the highlights of her research career as serving at UCSF as the Principal Investigator and founding Director of the multidisciplinary NIH-funded Center to Address Disparities in Children’s Oral Health, nicknamed CAN DO, which aimed to prevent and reduce oral health disparities, with a special focus on preventing early childhood caries. The second 7-year cycle of NIH funding totaled \$24.4 million. Another very proud moment was when UNC’s national ranking among the U.S. dental institutions improved from seventh to second while under her deanship.

Are there any students you've mentored that really stood out to you, and what work did they do with you?

JW: “Some of my early mentees are now established scientists and dental school professors. One just became an Associate Dean for Research,” says Dr. Weintraub. “In 2020, I have co-authored published or accepted research papers with recent UNC graduates who were UNC dental students (Klein, Jamison), graduate students (Oh, McLeod) and dental public health resident (Norris) as well as many faculty.”

TW: Dr. Wright remarked, “If you’ve got somebody that’s really passionate about what they’re doing and they really want to learn, they’re the most fun to work with. If they’re excited, that excitement spills over.”

What tips and advice do you have for students wishing to get involved with research?

TW: “Find a good mentor; somebody who’s willing to spend time with you and that you get along with, and you see them as a role model,” Dr. Wright says. “They’re doing things that you think that you’re proud of and that you would like to emulate those things.”

JW: Dr. Weintraub recommends that students “talk to many people and find a topic that you are passionate about and people with whom you enjoy working.” She began attending the AADR meeting as a college senior and now serves as the AADR Vice President, a testimony to it being a lifelong, professional home for her. “Getting involved with the Student Research Group and the American/International Association for Dental Research will help connect you to others with similar interests.”

KD: “Be strategic and have fun with it,” Dr. Divaris advises. “Utilize your time wisely. As a student, you have to choose carefully where to invest your time from a career development standpoint. So, when it comes to devoting time to research, you have to make sure that the project (and the team, lab, or individual mentor) are all good matches with your interests and skill set. The whole process must also be intellectually stimulating, designed to produce tangible products (e.g., presentations, publications) and have elements of creativity and fun—you don’t want to be stuck with a research project that you don’t enjoy or feel invested in, especially when you have so many competing assignments and other interesting things to delve into, as a dental student.”

FALL FACULTY MIXER

Each semester, the UNC Student Research Group hosts a student-faculty mixer to pair students interested in participating in research with faculty mentors. This fall, the faculty mixer took place via Zoom to comply with social distancing recommendations of the COVID-19 pandemic. SRG members rotated through small breakout rooms to network, brainstorm, and socialize with esteemed faculty as well as with each other.



"The SRG fall faculty mixer is a great opportunity for students interested in research to meet faculty advisors and learn about potential projects they can become involved in. Student mentees can select projects in their areas of interest and link up with faculty advisors to gain research experience."

- Marla O'Neal, D4

UPDATED FACULTY RESEARCH PROFILES



We are pleased to announce that the Office of Discovery and Innovation has created an up-to-date list of faculty research profiles. This document contains descriptions of faculty research as well as their willingness to and interest in mentoring students. This is an excellent resource to help students connect with potential mentors and to learn more about research projects that are taking place in our community.

[CLICK HERE TO VIEW](#)

UPCOMING RESEARCH CONFERENCES

ADEA Annual Session & Exhibition

American Dental Education Association - [Click here](#) for more information!

Dates: March 13-16 2021

Location: Online

Abstract Deadline: PASSED

AACD Scientific Session

American Academy of Cosmetic Dentistry - [Click here](#) for more information!

Dates: April 14-17, 2021

Location: Aurora, Colorado

Poster Deadline: March 15, 2021

National Oral Health Conference

American Academy of Public Health Dentistry - [Click here](#) for more information!

Dates: April 16-17 / 23-24 / 30, 2021

Location: Online

Abstract Deadline: PASSED

AAPD Annual Session

American Academy of Pediatric Dentistry - [Click here](#) for more information!

Dates: May 27-30, 2021

Location: Online

Abstract Deadline: PASSED

ADHA Annual Conference

American Dental Hygienists Association - [Click here](#) for more information!

Dates: June 18-20, 2021

Location: Phoenix, Arizona (online options are being explored)

Abstract Deadline: March 5, 2021

IADR/AADR/CADR General Session & Exhibition

International Association of Dental Research - [Click here](#) for more information!

Dates: July 21-24, 2021

Location: Boston, Massachusetts and online option

Abstract Deadline: March 1, 2021

Abstract re-submissions from 2020 are allowed



NSRG National Student Research Group

AADR American Association for Dental Research



UNC_SRG

Follow us on Instagram for the latest updates, deadlines, and announcements!



UNC

ADAMS SCHOOL OF DENTISTRY



Unless otherwise stated, all professional portrait and candid photos used in this newsletter were taken by William Christopher Pope of the UNC ASoD