A Welcome from this year’s Dental Student Research Group President

-Stuart Ryan, D4

“Thank you for your interest in student research at IUSD and for taking the time to explore our newsletter! We have many cutting-edge projects taking place at the dental school and we are excited to share some of our work with you. Our campus organization, the Dental Student Research Group (DSRG), meets every other Tuesday at 5:15PM to present our research findings and collaborate on projects in what we call the Student Research Presentation Program (SRPP). We welcome students from all education levels and research backgrounds, with a diverse membership consisting of undergraduate, DDS, and graduate students – and we would love to have you join us! Research at IUSD gives students a unique opportunity to get involved with an aspect of dentistry that many students never get to experience. The projects and contributions that our students make significantly add to the advancement of our profession as a whole. We have mentors from every department in the school that can help you devise a project that fits your interests and your schedule. Students from our research group have traveled all over the country to present their work and have won many awards at the national level. I want to thank Mark Vaughn for his tremendous effort putting the latest issue of this newsletter together. Please enjoy this newsletter and do not hesitate to contact me (sjryan@iu.edu) or our faculty mentor, Dr. Angela Bruzzaniti (abruzzan@iu.edu), if you have any questions at all related to student research at IUSD.”

-Stuart Ryan
IUSD Class of 2016
DSRG President
The Student Research Group is an IUSD organization sponsored by Dr. Angela Bruzzaniti and Dr. Richard Gregory in which students share their research efforts in biweekly meetings with faculty and other students.

**Interested in student research?**
Research is an exciting and fulfilling endeavor that is available to every IU dental student. Students may choose to select an existing project that they are interested in or they may choose to develop their own study!

**STUDENT RESEARCH FAST FACTS:**

15
Number of research fellows selected for the 2015-2016 school year.

$3,500
Stipend awarded to each research fellow for the successful completion of a research proposal and subsequent study.

$1,000
In travel support for those students who will be presenting at the International Association for Dental Research (IADR) or the American Association for Dental Research (AADR) annual session.

For more information:

Contact: Dr. Angela Bruzzaniti (abruz@iu.edu) or Dr. Richard Gregory (gregory@iu.edu)

See page 9 for a list of possible 2015-2016 research mentors.
2015-2016 IUSD Student Research Fellows

**DDS Class of 2016:**

**Blake BALLENGER**  
Project: Thrombopoietin and stem cells for cranial regeneration.  
Faculty Mentor: Dr. Chu, Biomedical and Applied Sciences

**Kylie BONTRAGER**  
Project: Characterization of a 22.5 kDa serine proteinase identified in the collagen degradation pathways of temporomandibular synovial joint fibroblasts  
Faculty Mentor: Dr. Windsor, Biomedical and Applied Sciences

**Stuart RYAN**  
Project: Cervical Vertebrae Angulation and Airway Dimensions: a 3D-CBCT Volumetric Analysis  
Faculty Mentor: Dr. Ghoneima, Orthodontics and Oral Facial Genetics

**Laura ALBRECHT**  
Project: BioXclude™ Amnion Chorion Allograft Membrane Effects on Matrix Metalloproteinase and Cytokine Expression from Human Dental Pulp Fibroblasts  
Faculty Mentor: Dr. Windsor, Biomedical and Applied Sciences

**Hengameh OLHAGH**  
Project: Effect of Lrp5 overexpression on the temporomandibular joint  
Faculty Mentor: Dr. Utreja, Orthodontics and Oral Facial Genetics

**DDS Class of 2017:**

**Mark VAUGHN**  
Project: Effect of Probiotic Species Amidst *Streptococcus mutans* Biofilm Formation on Orthodontic Brackets and Human Enamel Chips  
Faculty Mentor: Dr. Stewart, Orthodontics and Oral Facial Genetics and Dr. Gregory, Biomedical and Applied Sciences
**DDS Class of 2017 (cont):**

**Molly OSTER**
Project: The effect of processing parameters and stem cell seeding density in partially demineralized macroporous allografts for cranial regeneration
Faculty Mentor: Dr. Chu, Biomedical and Applied Sciences

**Loan Anh Thi Do**
Project: The role of Kalirin and Neurotrophins in Bone Cells
Faculty Mentor: Dr. Bruzzaniti, Biomedical and Applied Sciences

**Alexander VORIS**
Project: Effects of Electronic Cigarette liquids on Matrix Metalloproteinase Expression from Human Gingival Fibroblasts
Faculty Mentor: Dr. Windsor, Biomedical and Applied Sciences

**DDS Class of 2018:**

**Yasaman AFSHAR**
Project: Degradation Behavior and Mechanical Properties of Nanofibrous Scaffolds Electrospun from Resorbable Synthetic and Natural Polymers
Faculty Mentor: Dr. Bottino, Biomedical and Applied Sciences

**Usama KAMAL**
Project: Effects of *Salvadora Persica* on human gingival fibroblasts expression of matrix metalloproteinases and collagen degradation
Faculty Mentor: Dr. Windsor, Biomedical and Applied Sciences

**Allison WILLIAMS**
Project: The Dentinogenesis Effect of Dynamatrix and C-point: A Pilot Study
Faculty Mentor: Dr. Windsor and Dr. Song, Biomedical and Applied Sciences

**Michael HOAGBURG**
Project: Temporomandibular Joint Overloading
Faculty Mentor: Dr. Utreja, Orthodontics and Oral Facial Genetics

**Kristine PHILLIPS**
Project: Bioactive Nanofibrous-Based Calcium Phosphate Containing Scaffolds for Periodontal Bone Tissue Engineering
Faculty Mentor: Dr. Bottino, Biomedical and Applied Sciences

**Elizabeth CLOSURDO**
Project: The Translucency Parameters of Full Contour Zirconia Under Different Sintering Temperatures and Their Effects on the Degree of Conversion of Resin Cements
Faculty Mentor: Dr. Chu, Biomedical and Applied Sciences
One thing this year proved to us is that hard work pays off! IUSD students won competitions all over the globe! Pictured to the right is Stuart Ryan (D4), the winner of **SCADA (Student Clinician Research Program of the American Dental Association)**. Stuart writes about the competition, “The event runs concurrently each year with the ADA General Session and is sponsored by DENTSPLY International. One D.D.S. student from each dental school in the country is invited to attend and compete in a four hour poster presentation competition. There are two categories for the competition: Clinical Science/Public Health and Basic Science. This year, the event was held in Washington, D.C. at the Walter E. Washington Convention Center. The awards reception was held at the beautiful rooftop banquet hall on Pennsylvania Avenue. I was fortunate to be awarded 1st place in the Clinical Science/Public Health category for my project involving the clinical potential of novel antibacterial scaffolds for regenerative endodontic applications. My experience with the SCADA competition was fantastic. I enjoyed meeting other students from across the nation interested in dental research as well as exploring the history that Washington, D.C. has to offer. I want to thank Dr. Marco Bottino for his tremendous mentorship throughout my project and DENTSPLY for their support of student research and sponsorship of the event.

**The Hinman Award**

Bringing home IUSD’s first prestigious Hinman Award is Joshua Evans (D4) pictured to the left. Below, Stuart Ryan, who also competed in the competition explains what the Hinman meeting is, “The Hinman meeting is a symposium that occurs every October where dental students from across the nation share their research with both oral and poster presentations. It is hosted by the University of Tennessee Health Science Center College of Dentistry and it takes place at the famous Peabody Hotel in downtown Memphis, TN. Two students from each dental school are eligible to participate in the symposium each year. Josh Evans and I both presented posters detailing our individual projects within the field of regenerative endodontic biomaterials. Excitingly enough, Josh left Memphis with an award for his work involving the synthesis of novel antibacterial scaffolds that have shown the ability to inhibit *P. gingivalis* growth!”
How would you explain your experience at the Hinman Meeting?
My experience was fantastic. I got to listen to students from across the nation share their work from a wide variety of topics within dental research. I got to network with other students who are interested in similar research projects as myself, and I got to share my own findings to a large audience who visited my poster during the presentation session. Aside from research, we also got to explore Memphis, walk up and down the exciting Beale Street, tour the historic Graceland mansion, and eat delicious local barbecue! I highly recommend any students at IUSD interested in research try to attend this symposium.

How did this experience shape your view on research?
My weekend at the Hinman Symposium in Memphis only further energized my passion for dental research. It is always exciting to see fellow students helping to advance the profession of dentistry through research involvement. I hope future IUSD students will continue to travel to conferences like this and share the innovative research being conducted here at our school. I want to thank Dr. Marco Bottino for his outstanding mentorship on my project and Dr. Angela Bruzzaniti for traveling with us as our faculty mentor and supporting our presentations in Memphis.
Dr. Achint Utreja joined the IU School of Dentistry Department of Orthodontics and Oral Facial Genetics in 2014. Currently, he serves as the Pre-doctoral Orthodontic Program Director. His research interests include bone and cartilage biology, TMJ development and response to mechanical loading. In August of 2015, Dr. Utreja was appointed director and leader of the Mineralized Tissue Histology Research Laboratory (MTHRL) which provides an array of services to IUSD researchers and beyond such as processing soft tissue and hard tissue specimens in order to provide comprehensive histological services.

Q: What inspired you to participate in research?

A: As a dental student, I was always interested in research; however, during my initial dental training in India, I was not presented with significant research opportunities. Back then, didactic lecturing was an essential component of dental education with little emphasis on critical thinking, which is the foundation for research. Here at IUSD, the situation is quite different. I feel that dental students are very fortunate to have dental research opportunities readily available to them during dental school. As I did not get a chance to actively pursue research during dental school, I sought out various opportunities after graduation, and have been involved in both clinical as well as basic science research projects over the past few years. What started out as curiosity for me has developed into an integral part of my career and I am passionate about what I do.

Q: If you could say something to motivate students to become involved in research, what would you say?

A: I strongly feel that I have a much better appreciation for all aspects of the dental curriculum due to my involvement in various research projects over the past few years. This includes clinical research that I conducted during the M.S. in Oral Sciences program at the University of Illinois at Chicago (UIC) College of Dentistry and basic science research during the Ph.D. in Biomedical Science and Orthodontics residency programs at the University of Connecticut. Experiences such as these are crucial for clinicians-in-training in order to appreciate the biological basis for most dental clinical procedures. As an orthodontist, my research focusing on temporomandibular joint (TMJ) biology and orthodontic tooth movement has been instrumental in improving my understanding of the underlying cellular and molecular events during these processes. I have realized that as a clinician I was only scratching the surface of a rather fascinating aspect of dentistry that suddenly opened up following my involvement in research. Questions related to TMJ biology and diseases, accelerating orthodontic tooth movement and preventing post-orthodontic treatment relapse, are just some examples of research ideas that are highly relevant clinically.

Q: What current projects are you working on or providing aid for?

A: The primary focus of the research during my Ph.D. was cellular and histological evaluation of the TMJ cartilage in animal models. I was specifically interested in analyzing the response of the cartilage and underlying subchondral bone to
mechanical stress in genetically modified transgenic mice. We developed a TMJ loading model and studied the distribution of cellular subpopulations in resting and mechanically loaded joints. Presently, I am utilizing a similar model in the Mineralized Tissue Histology Research Laboratory (MTHRL) at IUSD in my continuing attempt to better understand the TMJ. I am also interested in studying the biological basis for orthodontic tooth movement using rodent models. Orthodontic treatment is considerably lengthy, and the accompanying poor oral hygiene often leads to restorative and periodontal complications. As a result, there is continued interest in expediting the rate of orthodontic tooth movement both mechanically and biologically. However, both approaches rely on a thorough understanding of the underlying biological processes during tooth movement. Animal models are particularly useful in this context as subtle biological changes can be analyzed and quantified prior to the application of new techniques in a clinical setting. Earlier this year, I received grant support from the American Association of Orthodontists (AAO) to analyze the use of light forces for tooth movement and maxillary expansion. Currently, orthodontic appliances deliver very high forces that are not ideal biologically. One of the aims of this project is to develop and validate appliances that deliver physiologically acceptable forces during tooth movement and maxillary expansion. Additionally, I started a couple of other craniofacial projects in the lab over the summer this year utilizing various animal models, and am eagerly looking forward to the results!

Q: How has research benefited you in your career and in your life?

A: Research has given me a much better appreciation of all that I do as a clinician, including understanding and predicting orthodontic treatment in patients, especially using various growth modification appliances. I feel very fortunate to have realized my passion for research, and to be working in a position here at IUSD where I can strike a balance between teaching, research and clinical care.
ORAL BIOLOGY
Angela Bruzzaniti  DS 243
Dominique Galli DS 261
Richard Gregory OH 123
Laura Romito  DS B19
Stuart Schrader DS B26
Fengyu Song  DS 244
Jack Windsor  DS 271

ORAL FACIAL DEVELOPMENT
Katherine Kula, Chair  DS 250
Jie Chen  DS 250/SL 260J
Judith Chin  RI 1110
Ahmed Ghoneima  DS 235A
James Jones  RI 1110
Tom Katona  DS 250A
Joan Kowolik  DS 220G
Sean Shih-Yao Liu  DS 270
Brian Sanders  RI 1110
Kelton Stewart  DS 270

ENDODONTICS
Kenneth Spolnik  DS 303
Ygal Ehrlich  DS 302

ORAL PATHOLOGY, MEDICINE AND RADIOLOGY
Susan Zunt, Chair  DS S110
Edwin Parks  DS S110
Jack Schaaf  DS S121
Margot Van Dis  DS S110
Mythily Srinivasan  DS 290

PERIODONTICS AND ALLIED DENTAL PROGRAMS
Vanchit John, Chair  DS 423
Steven Blanchard  DS 423
Joe Bidwell  MS 1030
Michael Kowolik  DS 260

PREVENTIVE DENTISTRY
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Masatoshi Ando  OH 129
Anderson Hara  OH 149
Richard Jackson  OH 144
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Gerardo Maupome  OH 144
Armando Soto  OH 120
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Karen Yoder  WK 118
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RESTORATIVE DENTISTRY
David Brown, Chair  DS S317
Tien-Min Chu  DS 112
Steve Haug  DS S-304
Jeffrey Platt  DS 118
Marco Bottino  DS 118

ORAL SURGERY & HOSPITAL DENTISTRY
Carrie Klene
Thank you for your interest in the latest edition of the Student Research Initiative! We would like to extend our most sincere gratitude to Indiana University School of Dentistry and its faculty and staff for their ongoing support of student research. We aspire to continue production of this newsletter to help keep the campus informed of all of the exciting student research efforts going on in the dental community. The Student Research Initiative team would like to extend a special thank you to our faculty mentors, Dr. Angela Bruzzaniti and Dr. Richard Gregory, for their inspiration, and guidance.

IUSD Student Research Group Officers

President: Stuart Ryan, D4
Vice President: Blake Ballenger, D4
Secretary, Treasurer: Molly Oster, D3
Newsletter Editor-in-Chief: Mark Vaughn, D3

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