**Narwhal: One of the Most Contiguous Vertebrate Genomes**

At a recent Advances in Genome Biology and Technology meeting, Dr. Martin Nweeia, lecturer in the Department of Restorative Dentistry and Biomaterials Sciences, announced a de novo narwhal assembly to participants as The Narwhal Genome Initiative announced its collaborative work with the University of California Davis Genome Center, the Broad Institute of MIT and Harvard, the Wellcome Sanger Institute, Pacific Biosciences, Dovetail Genomics, the University of Maryland Medical School, the Smithsonian Institution, and the Ocean Genome Legacy at Northeastern University.

Nweeia is searching for genetic clues to biologic and evolutionary questions of narwhal tooth development, expression, and morphology. “We are creating the library and instruction manual for the narwhal, and today brings us to one of the most complete and contiguous vertebrate genomes. Answers to our biologic questions are looming in these strands of DNA, and we remain committed to finding them.”

Nweeia’s recent book with the Smithsonian Institute, *Narwhal: Revealing An Arctic Legend* won the William Mills Award, given to the best published book on the Poles in a two-year period. Nweeia’s scientific investigation of the narwhal began nearly 20 years ago.

**KOTA RECEIVES NIH-NIAMS AWARD**

Satya Kota, PhD, instructor in Oral Medicine, Infection and Immunity, received a NIH-NIAMS R01 award, “Systematic Elucidation of Allele Specific Proteome at Imprint Control Regions (ICRs).”

Imprinting disorders are rare, epigenetic disorders that encompass multiple tissues and many of them lead to growth, endocrine and neurological defects with lasting affects during the lifespan of the affected individual. In this project, Dr. Kota aims to elucidate the proteome on parental alleles of ICRs to understand how parent-of-origin expression is maintained during development. Findings from this study will lead to a greater understanding of the type of trans protein factors at ICRs and will provide mechanistic details into their roles in cis regulation. Overall, these studies will lead to deeper understanding of monoallelic gene regulation that underlie multi-tissue pathologies of associated disorders and may help inform the design of novel therapeutic and diagnostic approaches for these disorders.

Dr. Kota is also a recipient of career development grant from NIH-NIAMS that is aimed to gain insights into epigenetic regulation and its key targets during skeletal development and progenitor cell differentiation.
KRAKOW AWARDS

William Arden, DMSc 2021
Endodontics
Dr. Arden is working on “Assessing the Neurotoxicity of Endodontic Sealers” with Dr. Jennifer Gibbs at HSDM.

Ozge Erdogan, DMSc 2022
Oral Biology
Dr. Erdogan is working on “Exploring Host-Microbiome Interactions in Symptomatic and Asymptomatic Irreversible Pulpitis Using Quantitative Proteomics” with Dr. Jennifer Gibbs at HSDM and Dr. Markus Hardt from the Forsyth Institute.

Ha Bin Park, MMSc 2022
Endodontics
Dr. Park is working on “Electrokinetic Flow: Novel Technology for the Enhanced Release of Dentinal Growth Factors” with Drs. Jennifer Gibbs at HSDM and Jongyoon Han at the Massachusetts Institute of Technology.

Howard Yoon, MMSc 2022
Endodontics
Dr. Yoon is working on “Evaluation of Resveratrol as an Adjunct for Direct Pulp Capping in Reparative Dentin Formation and Post-Operative Pain Suppression in Mice” with Dr. Jennifer Gibbs at HSDM.

Dr. Alvin Arlen Krakow, widely known as the leading force behind the establishment of Harvard School of Dental Medicine’s postdoctoral program in endodontics, passed away in 2018. His lasting legacy at the School includes funding the annual Krakow Research Awards.

PUBLICATIONS

DEVELOPMENTAL BIOLOGY


Volloch V, Olsen BR, Rits S. AD “Statin”: Alzheimer’s disorder is a “fast” disease preventable by therapeutic intervention initiated even late in life and reversible at the early stages. Annals of Integrative Molecular Medicine 2020;2(1):75-89.


ORAL MEDICINE, INFECTION AND IMMUNITY


ORAL AND MAXILLOFACIAL SURGERY


ORAL HEALTH POLICY AND EPIDEMIOLOGY


This image is from Dr. Meghan McDougall’s, MMSc20 orthodontics research study, “The cornea and true horizontal as non-radiographic replacements for the cranial base in Steiner’s Cephalometric Analysis: A proof of concept study.”
DMD STUDENTS RECEIVE RESEARCH HONORS

Congratulations to the DMD students who received honors in research, or honors in global and community health for completing a rigorous research project and presentation to Dr. Francesca Gori, Dr. Shigemi Nagai, and Ms. Jane Barrow.

Alex Cruz, DMD21
Cruz completed, “Access to Hospital-Based Adult Special Needs Dental Care” with mentor Dr. Nalton Ferraro for honors in research.

David Danesh, DMD20

Ryan Lisann, DMD20

HSDM FORSYTH RESEARCH ACADEMY GRADUATES

Dr. Nora Alhazmi joined the HSDM Forsyth Research Academy DMSc program in 2017. In her second and third years of the Program, she worked with research mentor, Dr. Eric Liao at Massachusetts General Hospital, on her thesis entitled, “Requirement of Wnt Modulator R-spondin3 in Craniofacial Morphogenesis and Dental Development.” Alhazmi reported, “My experience in the Research Academy has allowed me to practice novel research technology and helped me explore various areas of basic science research. The opportunity of pursuing my DMSc at Harvard has allowed me to explore ideas that have prepared me for my academic career. After graduation, I will join King Saud bin Abdulaziz University for Health Sciences in Saudi Arabia, as an assistant professor.”

Dr. Ali Alaqla also joined the HSDM Forsyth Research Academy DMSc program in 2017. After lab rotations at HSDM and the Forsyth Institute, he chose to join the Xiaozhe Han Laboratory in the Department of Immunology at the Forsyth Institute. He completed his thesis work, “Toll Like Receptors TLRs Stimulation of Bio Cells Expansion and Function” under the mentorship of Han. “I had a memorable time during my journey at Harvard that I will always treasure. The amount of scientific exposure that I received throughout the program was unique and well-delivered. I was fortunate to learn different molecular and histological methods which allowed me to open my eyes to promising research areas that I will continue to explore in my future research and academic career.” After graduation, Alaqla will join the College of Dentistry at King Saud bin Abdulaziz University for Health Sciences in Saudi Arabia.
Vicki Rosen, PhD, interim dean and professor and chair of Developmental Biology, received a subcontract award from Boston Children’s Hospital for an NIH-NIAMS R01 award, “Cfp1 Action in Cartilage.” Dr. Rosen is the co-investigator and Dr. Diana Carlone, instructor in Pediatrics at Boston Children’s Hospital, is principal investigator.

Transcription factors and signaling molecules are key modulators of cartilage development, with alterations in either resulting in skeletal anomalies. Dr. Carlone has identified Cfp1 as a factor required for cartilage formation. Results from this study will determine whether and how Cfp1 controls transcription factors and signaling molecules during cartilage development, which may impact our therapeutic approach to correct skeletal defects.

Jennie Marinucci, DMD20
Marinucci completed, “Exploring the Relationship Between Adverse Childhood Experiences and Oral Health” with mentor Dr. Erin Dunn for honors in global and community health.

Laurel Martinez, DMD20
Martinez completed, “Piezo Mechanosensory Channels Control Centriole Engagement via Calcium Signaling” with mentor Dr. Hao Wu for honors in research.

Kelly Suralik, DMD20
Suralik completed, “Effect of Fabrication Method on Fracture Strength of Interim Fixed Dental Prosthesis Restorations” with mentor Dr. Sang Lee for honors in research.

Kristen Sweeney, DMD20
Sweeney completed, “Fibrous Dysplasia and McCune Albright Syndrome: Understanding the Mechanisms of Disease Development and Progression Over Time” with mentor Dr. Leonard Kaban for honors in global and community health.

Amy Yu, DMD20
Yu completed, “Developing an Outcomes-Based Strategic Plan for Long-Term Evaluation of a Novel Global Oral Health Curriculum for Dental Students” with mentor Dr. Britttany Seymour for honors in global and community health.
This is a collaborative project funded by the American Dental Education Association entitled, “Dental Key: An Innovative, Online Clinical Lab Manual.”

The goal of this project is to improve clinical dental education by providing video demonstrations, illustrations, and step-by-step, best-practice instructions for basic dental procedures through a modern, intuitive, internet-based platform. The project aims to increase the utilization of modern technology in dental education to embrace the generational shift toward online learning. Ultimately, it is the hope this project will serve as a means of standardizing and democratizing dental education globally.

Photographed in the front row, left to right are faculty mentors, Dr. Supattriya Chutinan and Dr. Hiroe Ohyama. Top row, left to right are: Karen He, DMD21, Alice Li, DMD23, Leela Breitman, DMD21, Emily Van Doren, DMD22, and Jennifer Lee, DMD21.