

1 August 2022

Report: UMSAEP funded to School of Dentistry, Missouri-Dr Razia Adam

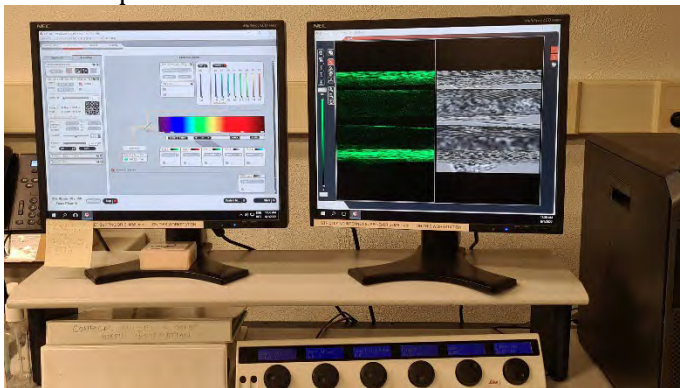
My trip was planned to occur in 2020 and due to the pandemic was postponed. I finally managed to travel to the Kansas City Campus between the 26 May- 10th June 2022. Initially the plan was to visit the Columbia campus too but that did not materialize as the students were on vacation.

I was hosted by Professor Yong Wang in the Department of Oral and Craniofacial Sciences and Director of Musculoskeletal Structure/Property Core Center. His research is focused on three major areas: dental biomaterials, calcified tissue, and applying new technologies in dentistry. The goal of my visit was to test the biomodified tissue conditioner material. The nanoparticles synthesised were transported to Missouri a few weeks earlier in preparation for my visit. Unfortunately, on my arrival I discovered that all the samples were transported to the Columbia campus in error. Plans were made to ship it back to UMKC.



In the meantime I shadowed some of the researchers in Professor Wang's laboratory:

1. **Viviane Hass**- DDS, MSc, PhD Postdoctoral fellow at University of Missouri - Kansas City
She has an interest in dentine bonding agents, use of polyphenols. A summer research scholar was working on her project. This project was focused on evaluating the effects of synthetic crosslinker methacrylate-functionalized proanthocyanidins (MAPAs) included in two commercial adhesives on dentin bonding after 1-year storage; specifically, the bonding properties such as micro-tensile bond strength, hybridization ability, nanoleakage, and the biomolecular analysis of the endogenous collagenases activity within the hybrid layer which will be assessed.
As part of this research, Dr Hass showed us how to test using the Confocal Fluorescence Microscope.



2. **Rong Wang**- Research Assistant Professor (Oral and Craniofacial Sciences)
Her research area involves using the Fourier transform infrared (FTIR) imaging technique was used in a transmission model for the evaluation of twelve oral hyperkeratosis (HK), eleven oral epithelial dysplasia (OED), and eleven oral squamous cell carcinoma (OSCC) biopsy samples in the fingerprint region of 1800–950 cm^{-1} .

In addition there were also two additional summer research scholars who worked on the following projects:

- Benign, Premalignant and malignant oral biopsy tissue evaluation using vibrational spectroscopic imaging.
- Longevity of digital restorations performed in a predoctoral clinical curriculum.

Meetings were also had with other staff members in the Dental school:

1. Jean-Marc Retrouvey- Professor and Chair, Department of Orthodontics and Dentofacial Orthopedics, Dr. Leo A. Rogers Endowed Professor in the Department of Orthodontics and Dentofacial Orthopedics

Dr. Retrouvey's goal as Chair of the Orthodontic Department is to build program focused on "Tradition through Innovation". Digital treatment planning, In house aligner therapy, 3D printing and the development of artificial intelligence and machine learning are his main research goals.

I spent a few sessions with Professor Retrouvey learning about his digital workflow and the incorporation into the residency programme.



2. Melanie Simmer Beck- Professor, Chair of Dental Public Health and Behavioral Science and Director of the STAHR Program

She holds joint appointments in the departments of Dental Public Health and Behavioral Science and Oral and Craniofacial Sciences. Dr. Simmer-Beck uses her interdisciplinary background in Oral and Craniofacial Sciences, Public Affairs & Administration, and Dental Hygiene to teach courses in Ethics & Professionalism and Clinical Decision Making, in addition to directing the dental pipeline program, STAHR Scholars Dentistry. Her research focuses on implementation science, program evaluation, access to oral health care, oral health disparities, dental workforce models and policy, and ergonomics. She has been the recipient of federal funds to move forward her research agenda. Dr. Simmer-Beck's research has been presented at national and international professional meetings and published in peer-reviewed journals.

3. Meghan Wendland-Assistant Professor , Department of Dental Public Health

Dr. Wendland teaches public health, behavioral sciences, and ethics and professionalism courses within the pre-doctoral dental program and coordinates the Interprofessional Education (IPE) curriculum for the School of Dentistry. Dr. Wendland's research focuses on disparities in health and health care and improving health outcomes in diverse populations. Her interests include medical-dental integration, person-centered care, and oral health care delivery reform.

4. Timothy Cox - Endowed Professor in Dental & Musculoskeletal Tissue Research

Dr Cox's research interests are in both basic and translation sciences, including in understanding genetic and epigenetic contributions to craniofacial development and influencing susceptibility to, and presentation of, common craniofacial conditions, such as cleft lip, midface hypoplasia and craniofacial microsomia. Dr Cox's research uses both the mouse and chick as model systems and quantitative high-resolution 3D tomographic imaging to qualitatively and quantitatively assess the impact of genetic mutations and maternal diet on early facial morphogenesis and its postnatal consequences. Part of his lab is also focused on providing new insight into the genetic basis of the aforementioned human conditions by employing the latest genomic sequencing tools on relevant patient cohorts in partnership with local, national and international collaborators.

In addition, meetings with Arif Ahmed- Associate Professor of Health Administration and Chair,

Department of Public Affairs in at the Henry W. Bloch School of Management, University of Missouri-Kansas City.

He is a health services researcher with clinical background. My current research interests are in alternative care delivery models, contextual characteristics and health, and leadership development in healthcare. He has experienced in developing and leading graduate and undergraduate programs in management and executive leadership programs in healthcare.

I also have a research collaboration with Sheila Grant- Associate Vice Chancellor of Research & Strategic Initiatives, Biological and Biomedical Engineering. A few meetings were held to discuss the project and introduce it to her group of students who will be working on it. Samples were left for development of a spray coating for denture acrylic.

Once I received my samples, I was able to schedule some characterisation studies of the nanoparticles with Dr Zhou. We were able to characterize the particles. A manuscript using this information is underway.

Recommendations- On my arrival at the dental school, here were two obstacles I faced:

1. My arrival was on a Friday of the Memorial day weekend. The dental school was closed till the Tuesday. I could not received my per diem cheque until then. In fact, when I did enquire at the school, they had no knowledge of it and I had to contact Professor Uphoff to assist me in tracking and shipping to Missouri. Staff at UMKC Dentistry should received information about the programme and coordinate a welcome package for visiting researchers.
2. I was informed that I could not 'work' or operate any equipment. I needed to have the necessary biosafety clearance and training. This was not communicated prior ,even though I had been in discussions with Professor Yong for more than 2 years. It is also an obstacle for further researchers from Dentistry who would like to visit. I strongly recommend that this be addressed.

I appreciate the time and the experience spent at UMKC. Special thanks to Professor Yong and his laboratory staff for hosting me. Also to Professor Timothy Cox and Liza Cox- Thank you for all your assistance with meetings and introducing me to your network. Your kindness and warmth will be remembered.

Prepared by Razia Adam
2 August 2022