

DENTALLIANCE Research Series

Keynote Address Immunomodulatory Strategies as Adjunctive Therapies to the Treatment of Periodontal Diseases

Dr. Shannon Wallet
Associate Dean for Research, Discovery and
Innovation at the UNC Adams School of Dentistry in
Chapel Hill, NC, USA



Invited Talks Fatty-Acid Structurally Nanoengineered Peptide Polymers kill multidrug resistant bacteria

Dr. Sara Hadjigol
Research Fellow
Immunology Cancer And Vaccine
Melbourne Dental School



Exploring the Applications of Microfluidic Systems in Oral, Dental and Craniofacial Research

Dr. Gopu Sriram
Assistant Professor, Discipline of Oral Sciences
National University of Singapore



7 April 2022, Thursday

Location	Time	Time Zone	UTC Offset
North Carolina	07:00	(EDT)	(UTC -4)
London	12:00	(BST)	(UTC +1)
Singapore	19:00	(SGT)	(UTC +8)
Melbourne	21:00	(AEST)	(UTC +10)

Free Admission

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Presented by:



BIOGRAPHY



KEYNOTE SPEAKER

Dr. Shannon Wallet
The University of North
Carolina at Chapel Hill

Shannon Wallet is the Associate Dean for Research, Discovery and Innovation at the UNC Adams School of Dentistry in Chapel Hill, NC, USA and serves in the capacity of Interim Chair in the Division of Oral and Craniofacial Health Sciences. In addition, she has joint appointment in the Department of Microbiology and Immunology at the UNC School of Medicine, is the Co-Director of the DELTA Translational Assays Core and oversees the Adams School of Dentistry's Clinical Research Unit, better known as GoHealth. Dr. Wallet's research interests are focused on mechanisms associated with altered innate immune functions, which lead to dysregulated adaptive immunity. Her program focuses on the contribution of epithelial cell biology and signaling to innate and adaptive immune homeostasis and dysfunction, where by the laboratory evaluates the contribution of 'epithelial cell innate immune (dys)function' to three major disease conditions: pancreatic cancer, type 1 diabetes (autoimmunity), and periodontal disease (autoinflammation). While appearing to be a diverse research program, many of the mechanisms and systems in play are surprisingly (or maybe not so surprisingly) similar allowing for rapid translation of their findings. Importantly, previous investigations into the role of epithelial cells in immunobiology have been hindered by a lack of robust primary cell culture techniques, which the Wallet laboratory has been able to overcome using both animal and human tissues. Thus, using their novel and unique tools they can evaluate our findings in the human conditions, again making translation of findings that much more feasible. In addition, the Wallet laboratory is a training home for pre-doctoral fellows in pursuit of their PhD and has a long history of providing resources and mentorship to junior faculty and dual trained individuals, including DMD, PhD and MD, PhD. Using tools, skills and resources gained from her past capacity as the Associate Dean for Faculty Affairs at University of Florida and my current position as Associate Dean of Research in the Adams School of Dentistry Dr. Wallet strives to meet the needs of all individuals wishing to part-take in research intensive experiences.



Dr. Sara Hadjigol obtained her Bachelor of Science (BSc) degree in Cellular and Molecular Biology at the University of Tehran, Iran, in 2001. In 2011, she completed a Master of Science degree majoring in genetic diversity in *Eucalyptus globulus* at department of Eucalypt Genetics, School of Plant Science, University of Tasmania, Hobart. Her project aimed to determine whether there was a signature that natural selection had caused differentiation amongst the races of *E. globulus* in candidate genes for wood properties. In this study she compared divergence detected by microsatellites markers which were assumed to be neutral to that detected by single nucleotide polymorphisms found in genes involved in the lignin and cellulose biosynthetic pathways, to determine if variation in these genes in *E. globulus* is likely to be adaptive or not. In 2017, Sara completed her PhD majoring in Immunology and Microbiology at Laureate Professor Paul Foster's laboratory in the Department of Microbiology and Immunology at the University of Newcastle, Australia. Her project aimed to investigate the mechanisms of how bacterial infection-induced activation of innate immune pathways leading to asthma exacerbations in a mouse model of allergic airways disease. In addition, she determined if miRNA expression is altered during exacerbations and whether targeting miRNAs could be a novel treatment approach in steroid-resistant inflammation. She continued as a Postdoctoral Research Fellow under the supervision of Professor Richard Kitching at the center of inflammatory disease (CID), Monash University in 2018. Her main research area was investigating the immune responses in experimental models of autoimmune anti-glomerular basement membrane (anti-GBM) disease, particularly focusing on defining the phenotype and function of various T cell populations including antigen specific CD4+ T cells, regulatory T cells, anergic and effector memory T cells in maintenance and loss of tolerance using multi-colour flow cytometry analysis. In 2020, she joined Antimicrobial and Cancer Therapeutics and Vaccine (ACTV) group at Melbourne University under the supervision of Professor Neil O'Brien-Simpson as a research fellow. Her research is focus on understanding the immunology behind enhancing and delivering peptide-based vaccines that are targeting cancer. She is also investigating the activity of anti-microbial peptides (AMPs) to kill superbugs and understanding the mechanisms of their actions.



Dr. Sara Hadjigol
Melbourne Dental
School



Dr. Gopu Sriram
National University of Singapore

Dr. Gopu Sriram is an Assistant Professor (tenure-track) at the Faculty of Dentistry, National University of Singapore. He also is the Co-Thrust Lead at the NUS Centre for Additive Manufacturing, where he oversees the applications of 3D printing, biofabrication, and other additive manufacturing technologies for oral and craniofacial applications. He received his Master's in Oral Pathology from India, Ph.D. in stem cells and tissue engineering from the National University of Singapore, and post-doctoral training in microfluidics and biofabrication technologies from the Institute of Medical Biology, Agency for Science Technology and Research (A*STAR), Singapore. His doctoral work focussed on understanding the stem cell differentiation and endothelial-pericyte interactions in the regeneration of vascularized tissue constructs. His postdoctoral research focussed on understanding the biomimicry and impact of blood flow on skin development using a microfluidic skin-on-a-chip platform. He also investigated the development and application of second harmonic generation and multiphoton microscopy for non-invasive and label-free imaging of full-thickness skin tissues.

His current research focuses on the application and convergence of microfluidics, 3D culture, and 3D printing-based biofabrication technologies in dental research. Through this, his team focuses on understanding host-microbiome interactions in periodontal disease, biocompatibility of dental materials, and regeneration of dental/ oral/ craniofacial (DOC) tissues.



DentAlliance Research Series Workshop is presented by DentAlliance and its partner institutions: the University of North Carolina at Chapel Hill, King's College London, National University of Singapore and University of Melbourne. **Through these workshops, we hope to offer networking opportunities and foster collaborations among the 4 institutions.**

Please RSVP by end March 2022 via:

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Registration is required before the event link and password will be shared with you subsequently.

There will be an interactive networking session the following week on **13 April 2022** for Academics seeking to start new **collaborations, to discuss funding opportunities, and get to know everyone!** Make sure you don't miss this opportunity and add your interest to attend when registering.