Department of Biomedical Engineering
UNIVERSITY OF WISCONSIN–MADISON

Spring 2026 Seminar Series

Bench-to-Bedside Engineering of Precision Immunotherapy Paradigms with Focused Ultrasound

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Research Director at UVA Focused Ultrasound Immuno-Oncology (FUSION) Center
University of Virginia

Immunotherapy has revolutionized cancer treatment, but significant limitations remain across solid tumor indications. This talk will highlight advances in the use of image-guided focused ultrasound (FUS) as a non-invasive, multi-pronged interventional tool for potentiating multiple classes of immunotherapy, including vaccine adjuvants, checkpoint inhibitors, and CAR T cells. We will showcase integration of non-invasive surveillance approaches such as positron emission tomography (PET) and liquid biopsy with FUS to inform precision, adaptation, and de-intensification of combinatorial treatment regimens. We will also showcase development of novel image-guided ultrasound instrumentation toward these objectives. Applications spanning high-risk breast cancer and adult/pediatric brain cancers will be discussed. Finally, this talk will overview clinical translation and insights from first-in-human trials investigating FUS for immuno-oncology applications.

About the Speaker

Dr. Natasha Sheybani is an Assistant Professor of Biomedical Engineering (BME), Radiology & Medical Imaging (courtesy), and Neurosurgery (courtesy) at the University of Virginia. She also serves as the Research Director of UVA's Focused Ultrasound Immuno-Oncology (FUSION) Center. Dr. Sheybani leads a multidisciplinary translational research program advancing image-guided focused ultrasound (FUS) and theranostic strategies for incisionless ablation, immunomodulation, and precision immunotherapy delivery in high-risk breast and brain cancer settings. Her research interfaces with multiple ongoing clinical investigations of FUS in oncology at UVA. Dr. Sheybani is the recipient of major federal awards including the NSF Graduate Research Fellowship, NCI F99/K00 Predoctoral-to-Postdoctoral Fellow Transition Award, NIH Director's Early Independence Award, and a $5.5M US Department of Defense Breast Cancer Research Program Era of Hope Scholar Award. Her work has been recognized by international media outlets including STAT News (Wunderkinds) and Forbes Magazine's "30 Under 30" List in Science, and she has been named a "Rising Star" by leading professional societies including the American Institute of Ultrasound in Medicine (AIUM) and International Society for Therapeutic Ultrasound (ISTU). She is currently the appointed Treasurer of ISTU, Co-Chair of the Academy for Radiology & Biomedical Imaging Research Council of Early Career Investigators in Imaging, and a scientific advisor to the National Brain Tumor Society. Dr. Sheybani completed her PhD in BME at UVA, followed by a postdoctoral fellowship in Oncology, Biomedical Data Science and Radiology at Stanford University.

Monday, April 6 at Noon
1003 Engineering Centers (Tong Auditorium)