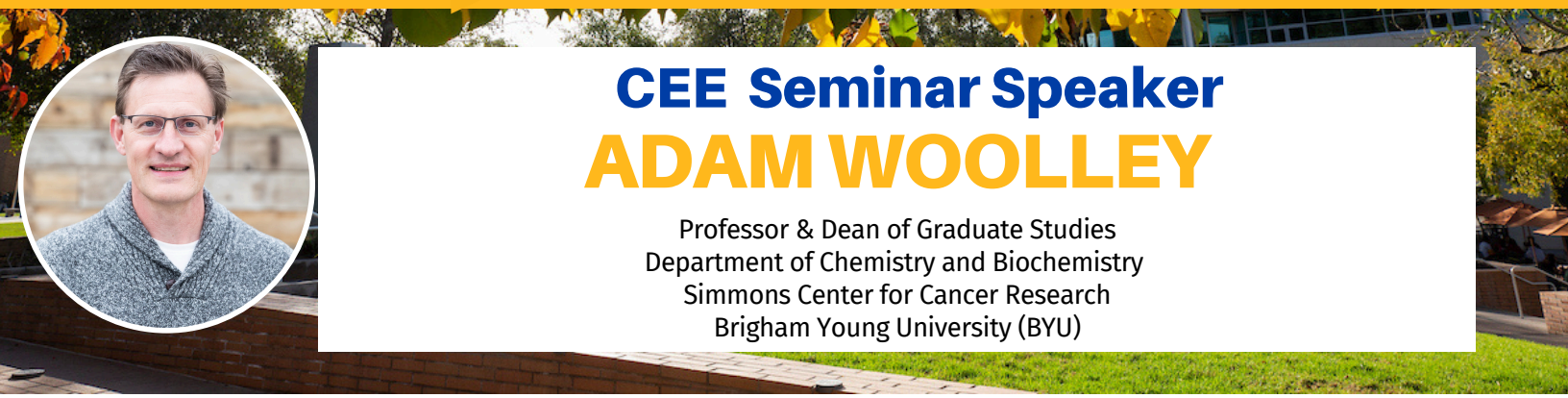
UC RIVERSIDE Chemical and Environmental Engineering



CEE Seminar Speaker

ADAM WOOLLEY

Professor & Dean of Graduate Studies
Department of Chemistry and Biochemistry
Simmons Center for Cancer Research
Brigham Young University (BYU)

APRIL 11TH, 2025 11:00 A.M. - 12:00 P.M. IN WCH 205/206

INTEGRATED 3D PRINTED MICROFLUIDIC SYSTEMS FOR BIOANALYSIS

3D printing provides a powerful process for making microdevices to be used in the detection of medically relevant analytes. We are developing 3D printers that create integrated microfluidic platforms to perform biomolecular analysis. The 3D printed devices contain components, including microchannels, pumps, and valves, which facilitate the biomedically important processes of electrophoresis, affinity extraction, and solid-phase extraction with fluorescence labeling . Applications of our integrated 3D printed devices include the analysis of biomarkers connected with preterm birth (PTB) risk, and the detection of RNA from mosquito-borne viruses. Using valves and pumps formed within these 3D printed systems, we carry out fluid handling processes that automate assays and integrate sample preparation steps to both simplify and accelerate biomarker analysis. Our approach further improves detection capabilities, decreases sample and reagent volumes used, and streamlines assay processes. Importantly, these emerging and promising results point to an exciting future for integrated 3D printed microfluidics in biomedical diagnostics.

BIOGRAPHY

Adam Woolley has been on the faculty at Brigham Young University (BYU) in the Department of Chemistry and Biochemistry since 2000. He is currently University Professor and Dean of Graduate Studies at BYU. Prof. Woolley received a B.S. degree in chemistry from BYU, a PhD in chemistry from the University of California-Berkeley and he was a Runyon-Winchell Postdoctoral Fellow in the Chemistry and Chemical Biology Department at Harvard University. Dr. Woolley's scholarship is directed at the interface between miniaturization and biomolecules. He develops microfluidic devices for chemical analysis with an emphasis on biomedically relevant assays, and he is utilizing biomolecules to self-assemble nanoscale electronic systems. His research has been funded by the NIH, NSF, Department of Defense, and other private and government funding entities.