

## MMI 291 Seminar Series

Current Theme: Interdisciplinary Research  
Winter Quarter 2024 – CRN 33382

Friday Seminar at 12:10-1 p.m.  
GBSF Auditorium, Room 1005

### “To EV or not EV? Translations of Raman Spectroscopy of Extracellular Vesicles in Clinical Diagnostics”

#### Research / Bio

**Dr. Randy Carney** is an Associate Professor of Biomedical Engineering at the University of California, Davis. He received his B.S. in Chemistry in 2008 from University of Arkansas. His M.S. at Massachusetts Institute of Technology (2010) and Ph.D. from EPFL in Switzerland (2013) focused on the impact of nanoscale surface structure in the organic ligand coating of metal nanoparticles on cell penetration. He continued his studies as a postdoctoral fellow and now professor at UC Davis in the fields of soft nanomaterials, including exosomes and extracellular vesicles (EVs). His group engineers' platforms to examine the use of EVs as next-generation cancer therapeutics and biomarkers. Sensitive and specific detection of the cell-specific biomaterials recruited and packaged in EVs has the potential to improve identification and monitoring of cancer. To accomplish this, a central focus of in Carney Lab is the application of Raman spectroscopy, especially via surface-enhancement, as an optical platform for biomarker discovery. They also explore therapeutic approaches to use EVs for drug delivery.

#### Publications

Koster HJ, Guillen-Perez, A, Gomez-Diaz JS, Navas-Moreno M, Birkeland AC, **Carney RP**. “Fused Raman spectroscopy analysis of blood and saliva delivers high accuracy for head and neck cancer diagnostics”. *Nature Scientific Reports*, 2022; 12(1):18464. PMID: PMC9630497

Mizenko, RR, Brostoff, T, Rojalin, T, Koster, HJ, Swindell, HS, Leiserowitz, GS, Wang, A, **Carney RP**. “Tetraspanins are unevenly distributed across single extracellular vesicles and bias sensitivity to multiplexed cancer biomarkers”. *J Nanobiotech*, 2021; 19:250. PMID: PMC8379740

Rojalin T, Koster HJ, Liu J, Mizenko RR, Tran D, Wachsmann-Hogiu S, **Carney RP**. “Hybrid Nanoplasmonic Porous Biomaterial Scaffold for Liquid Biopsy Diagnostics Using Extracellular Vesicles”. *ACS Sens*, 2020; 5(9):2820-2833. PMID: PMC7522966 Selected as ACS Editors' Choice

January  
26



**Randy Carney, Ph.D.**  
Associate Professor  
Biomedical Engineering  
University of California at Davis

January 26, 2024  
12:10 – 1 p.m.  
GBSF Auditorium  
Room 1005

In-person presentation

Medical Microbiology  
and Immunology  
School of Medicine

Seminar Contact:  
Autumn Vega  
530-752-9401

We hope to see you there!