

MMI 291 Seminar Series

Current Theme: Interdisciplinary Research
Winter Quarter 2025 – CRN 30957

Friday Seminar at 12:10-1 p.m.

Genome and Biomedical Sciences Facility, Room 1005

“Engineered environments for cell fate decisions”

Research Bio

Gilchrist is an Assistant Professor of Biomedical Engineering at the University of California, Davis, with affiliations in the Materials Science and Engineering Graduate Group and the Comprehensive Cancer Center. He earned his Ph.D. in Materials Science and Engineering from the University of Illinois Urbana-Champaign and completed postdoctoral training at Stanford University. His research leverages biomaterials-based approaches to uncover the mechanisms of stem cell aging, focusing on how both biological and reproductive aging alter the microenvironment. A key emphasis of his work is on nonlinear elasticity and the interplay between mechanotransduction and metabolic state. His research in aging has been supported by the American Federation for Aging Research (AFAR). Beyond aging, his lab has applied biomaterials strategies to study how the tissue microenvironment influences disease progression. This includes investigating the emergence and progression of fatty liver disease using a hepatic organoid model, as well as exploring chemoresistance mechanisms in pancreatic ductal adenocarcinoma.

Publications

Gilchrist AE, Lee S, Hu Y, Harley BAC. “Soluble Signals and Remodeling in a Synthetic Gelatin-Based Hematopoietic Stem Cell Niche”. *Adv Healthc Mater*. 2019 Oct;8(20):e1900751. doi: 10.1002/adhm.201900751. Epub 2019 Sep 18. PMID: 31532901; PMCID: PMC6813872.

LeSavage BL, Zhang D, Huerta-López C, **Gilchrist AE**, Krajina BA, Karlsson K, Smith AR, Karagyozova K, Klett KC, Huang MS, Long C, Kaber G, Madl CM, Bollyky PL, Curtis C, Kuo CJ, Heilshorn SC. “Engineered matrices reveal stiffness-mediated chemoresistance in patient-derived pancreatic cancer organoids”. *Nat Mater*. 2024 Aug;23(8):1138-1149. doi: 10.1038/s41563-024-01908-x. Epub 2024 Jul 4. PMID: 38965405.

Gilchrist, Aidan E., et al. Transient Competitors to Modulate Dynamic Covalent Cross-Linking of Recombinant Hydrogels”. *Chemistry of Materials* 35.21 (2023): 8969-8983.

Feb.
14



Aidan E. Gilchrist, Ph.D.
Assistant Professor
Biomedical Engineering
University of California, Davis

February 14, 2025
12:10 – 1 p.m.

**Genome and
Biomedical Sciences
Facility, Room 1005**

In-person presentation

**Medical Microbiology and
Immunology
School of Medicine**

Seminar Contact:
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We hope to see you there!