

CARNEGIE MELLON UNIVERSITY

BME 2025 SPRING SEMINAR SERIES

Human Lymphatic System on a Chip



PRESENTED BY

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SCHEDULE

Doherty Hall (DH) 2315

**Thursday,
January 16, 2025
(11:00-12:00 PM)**

We develop and engineer three-dimensional (3D) microphysiological systems (MPS) of human lymphatics to better understand lymphatic functions and dysfunction and provide new therapeutic strategies to treat lymphatic-related human diseases, including (i) lymphedema, (ii) cancer, and (iii) neurological disease. Lymphatic vessels drain interstitial fluid and maintain tissue fluid homeostasis; thus, lymphatic vessel dysfunction can cause lymphedema (swelling due to excess fluid buildup). Lymph fluids also contain biomolecules (e.g., antigens, metabolic waste) and cells (e.g., immune cells, cancer cells), which affect host immunity, waste clearance, and cancer. We develop and engineer the MPS to recapitulate unique lymphatic structures, including the initial and collecting lymphatic vessels with button- and zipper cell junctions and primary and secondary lymphatic valves, which are the hallmark functional properties of the lymphatic vessels.

