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### Visualizing and delivering immunotherapeutics through the lymphatics

**Abstract:** The development of drugs or devices to treat vascular diseases exploded following the advent of hemovascular imaging, i.e., MR and CT angiography. Yet unlike the blood vasculature, there have been a paucity of techniques available to non-invasively image the lymphatics: a non-circulatory, unidirectional vascular system that returns fluid and activated immune cells to the blood circulation. As a result, the treatments for lymphatic disorders have remained largely unchanged for over a century.

For more than a decade, our translational research team has developed and refined near-infrared lymphatic imaging techniques in over 400 infants, children, and adults to underscore anatomical and functional changes in the lymphatics with various chronic conditions and diseases. Armed with a new perspective of lymphatics, we are now using the imaging techniques to understand how the lymphatics can (i) contribute to cancer metastasis, autoimmune diseases, and neuroinflammation, (ii) be manipulated to improve these conditions and diseases, and (iii) be targeted using new approaches to more efficiently deliver immunotherapeutics.

The seminar will provide a review of the physiology of the lymphatics, identify key questions that remain unanswered, and show new lymphatic strategies that could provide more effective treatment of some of our most costly chronic conditions.