BiophysTO Lunchtime Seminar Series

Date

Thursday, May 4th 2023
12:00 – 1:00 pm
Pizza to follow

LOCATION:
McLennan Physical Laboratories
255 Huron Street
Rm. 606

Host: Wilson Zeng

Landon J. Edgar

Department of Pharmacology & Toxicology,
Department of Chemistry, University of Toronto

T cell Glycosylation in Health and Disease

T cells are required to establish and maintain diverse antigen-specific immune responses, including pathogen clearance, anti-tumour immunity, and self-tolerance. To fully activate against a cognate antigen, T cells require multiple signals relayed by an antigen presenting cell (APC) across a cell:cell interface – the immunological synapse (IS). Current models describing this process focus on IS-spanning complexation events between proteinaceous receptor:ligand pairs that decorate immune cell surfaces. While this model has been an important cornerstone of T cell biology for decades, it only considers a portion of the molecular landscape of an IS. This is because all immune cells are also coated by a dense matrix of structurally diverse carbohydrates (glycans) that are emerging as critical regulators of adaptive immune responses. Here, we describe our efforts to broadly characterize T cell glycosylation in settings of human health and disease, with a focus on fundamental immunophysiology, T cell exhaustion, and autoimmunity. Our approach applies next-generation flow cytometry technologies to illuminate changes in T cell glycosylation that are associated with stimulation and pathophysiology. Insights gained from this work will provide the foundational mechanistic information required to exploit immune cell glycosylation for future immunotherapeutic development.

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