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**Friday, May 1, 2026**

**12:00-1:00 pm**

**Morgridge Hall Seminar Room 7560**

**Zoom Meeting: 966 3372 9112**

<https://uwmadison.zoom.us/j/96633729112?pwd=tHFc9i1dAAqmXe05uWtw8wXBIQZxGB.1>

**Passcode: 621125**

## From Cells to Patients: Statistical Learning for Immune Profiling

**Abstract:** Modern AI in biomedicine depends critically on learning useful representations, yet in immune profiling the right patient representation is far from obvious. Patients are observed through large, heterogeneous collections of immune cells, while the scientific questions are patient-level, such as treatment response and disease risk. In this talk, I will present two complementary statistical learning strategies for moving from cells to patients beyond coarse pseudo-bulk summaries. The first learns predictive patient representations from individual cells, illustrated by cytoGPNNet, a flexible framework designed for variable cell numbers, small cohorts, and longitudinal data. The second represents each patient as a distribution over cells, enabling interpretable and principled comparisons of whole cell populations. I will describe Canonical Variates in Wasserstein space (CVW), which learns low-dimensional discriminative structure from such patient-level distributions. Together, these methods preserve clinically relevant cellular heterogeneity while supporting patient-level prediction and inference in immune profiling applications.

**Bio:** Lynn Lin is an Associate Professor of Biostatistics & Bioinformatics at Duke University, where she also holds secondary appointments in the Departments of Statistical Science and Computer Science. Her research focuses on developing principled statistical modeling and machine learning frameworks to address complex, high-dimensional problems in immunology, oncology, and lung disease. Dr. Lin's professional contributions have been recognized with prestigious honors, including the Mitchell Prize from the International Society of Bayesian Analysis. Beyond her research, she serves as the Associate Director of the Quantitative Sciences Core for the Duke Center for AIDS Research (CFAR) and has held leadership roles within the American Statistical Association, including Vice Chair of the Council of Sections Governing Board. She earned her Ph.D. in Statistics from Duke University and previously served as a faculty member at The Pennsylvania State University.



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