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Expanding the immunotherapy toolkit with protein design

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April 9th, 2026

1:30PM-2:50PM

****LK 130****

Abstract:

We have developed unique capabilities to design protein-based binders that can target a multitude of protein-based markers of diseased cells: surface proteins, intracellular proteins, and processed exogenous antigens. The overall strategy we use is to develop new methods that are more generalizable and physics-grounded than currently available tools, including artificial intelligence/machine learning (AI/ML) tools to address these challenges. In this seminar, I will describe our efforts in developing "zero shot" methods for designing cyclic peptides against cancer markers, as well as our TRACeR system that enables targeting of diseased cells broadly through their immunopeptidome.

Reading list

- Chu, A.E., Lu, T. & Huang, PS. Sparks of function by de novo protein design. Nat Biotechnol 42, 203–215 (2024). https://doi.org/10.1038/s41587-024-02133-2
- Lu T, Liu M, Chen Y ... Assessing generative model coverage of protein structures with SHAPES Cell Systems, 2025; 16