Cologne Evolution Colloquium

CRC 1310 Predictability in Evolution

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MixTCRpred: deep learning predictions of TCR-epitope interactions

T cells play a crucial role in eliminating infected and cancerous cells. In cancer, inducing new T cell responses or enhancing pre-existing ones is revolutionizing immunotherapy treatments. A T cell is activated when its T cell receptor (TCR) detects a specific peptide, called epitope, on the surface of infected or cancerous cells. Each person carries billions of T cells with unique TCRs, allowing the detection of a wide range of viral and cancerous targets. Unfortunately, such large diversity makes it difficult to experimentally determine which T cells recognize which epitopes.

Machine learning offers a promising solution to link TCRs with their cognate epitopes. In this presentation, I will introduce MixTCRpred, our tool for predicting TCR-epitope interactions, which recently ranked among the most accurate in an international benchmarking competition. I will outline its applications, including T cell-based diagnostics to detect diseases from T cells in blood samples, and identifying novel T cells to target specific cancer epitopes.

Thursday, 30 January 2025, 16:00
Institute for Biological Physics, Zülpicher Str. 77
Seminar Room Old Theory
Hosted by Denny Trimcev