A Nanophysics-Inspired Platform for Exploring Transient Protein-Protein Interactions

Initiative: Kurswechsel – Forschungsneuland zwischen den Lebenswissenschaften und Natur- oder Technikwissenschaften

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Transient protein-protein interactions form the basis of many cellular processes including pathogen-host interactions and viral diseases. Despite their importance, they have long been considered "undruggable" and remain an underexplored class of drug targets. Discovery of interaction modifier drugs has been limited by current tools for measuring transient interactions in a quantitative, high-throughput, and minimally perturbative manner. Drawing from prior experience in nanomaterials physics and nano-optics, the research team has been developing an optical method for detecting transient biomolecular interactions in solution. In close collaboration with experts in Structural Biology and Network Biology, the project aims to establish the proof-of-concept of the new technique and rigorously benchmark it against current state-of-the-art techniques in protein biology. The approach has the potential to connect the microscopic and macroscopic scales of this broad field and serve as the foundation of a platform for unearthing new biomolecular interaction targets and interaction mechanisms for drug discovery against viral diseases.

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