nucleate cluster

Seminar

We are excited to invite you to a talk by:

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Life in Flux: Dynamic RNA: Protein Complex Assembly Shapes Biomolecular Function

Date: Thursday, 30 July 2026
Time: 4:15 - 5:15 pm
Place: Zentralbau Chemie Lecture Hall C, Am Hubland, Würzburg

Link: https://uni-wuerzburg.zoom-x.de/j/69431704349?pwd=D9keKedfeQRfW5smrnyAan474O9len.1

The explosion of cryo-EM structures in recent years has underscored the stepwise assembly of stable biomolecular machines with defined, fixed compositions. In contrast, advances in single-molecule imaging—both in vitro and in live cells—are revealing a very different picture: Many biological complexes are not static but highly dynamic and transient. Instead of persisting as stable entities, their functions emerge from short-lived, fluid assemblies, whose lifetimes and outputs are governed by the kinetics of their components. This chemistry-driven paradigm shift—from rigid machines to kinetically controlled assemblies—offers a powerful framework for understanding gene regulation, proofreading, checkpoint control, and cellular adaptability.
This talk will illustrate this evolving view with two case studies: the kinetically programmed exchange behavior of the RNA silencing machinery, and the dynamic assembly of phase-separated RNA-protein structures (RNP granules) in mammalian cells. I will also explore broader implications of this model, including how regulatory signals can fine-tune molecular function by modulating kinetic parameters, rather than altering structure or affinity per se. By reframing molecular cell biology through the lens of kinetic control and spatiotemporal organization, this presentation aims to offer a unifying conceptual foundation across diverse areas of biomolecular science.

Speaker Profile: https://medschool.umich.edu/profile/2470/nils-g-walter