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# *Robert Maddin Lecture* in Materials Science

## **Biomolecular Condensates from Synthetic Intrinsically Disordered Proteins: Tools for Biotechnology and Synthetic Biology**

**Thursday, October 2, 2025**

**10:30 AM**

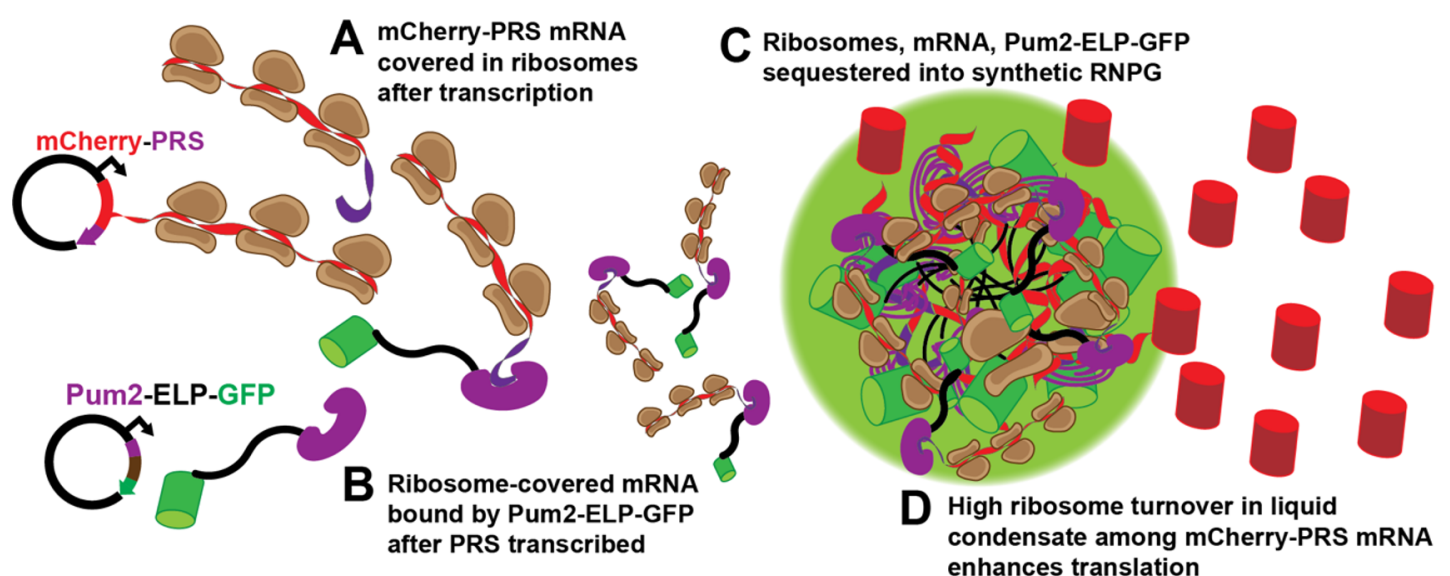
**Glandt Forum**

Singh Center for Nanotechnology



### **Ashutosh Chilkoti**

Alan L. Kaganov Professor of Biomedical  
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Synthetic intrinsically disordered proteins (SynIDPs) are genetically encoded polymers of short peptide repeats that exhibit upper critical solution temperature (UCST) or lower critical solution temperature (LCST) phase behavior, like many naturally occurring IDPs. SynIDPs solely recapitulate the intrinsically disordered regions of native IDPs that are believed to drive the phase separation behavior of native IDPs. Because of their simplicity, the phase behavior of SynIDPs can be rationally tuned at the molecular level by control of their sequence, composition, and chain length. I will describe how SynIDPs can be used to develop simple but powerful tools for biotechnology and medicine and for the design of synthetic biomolecular condensates in live cells to control diverse cellular functions.

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