Chemical & Physical Sciences
UNIVERSITY OF TORONTO
MISSISSAUGA

Colloquium Seminar Series
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3:10 p.m. via Zoom

https://utoronto.zoom.us/j/97184523374

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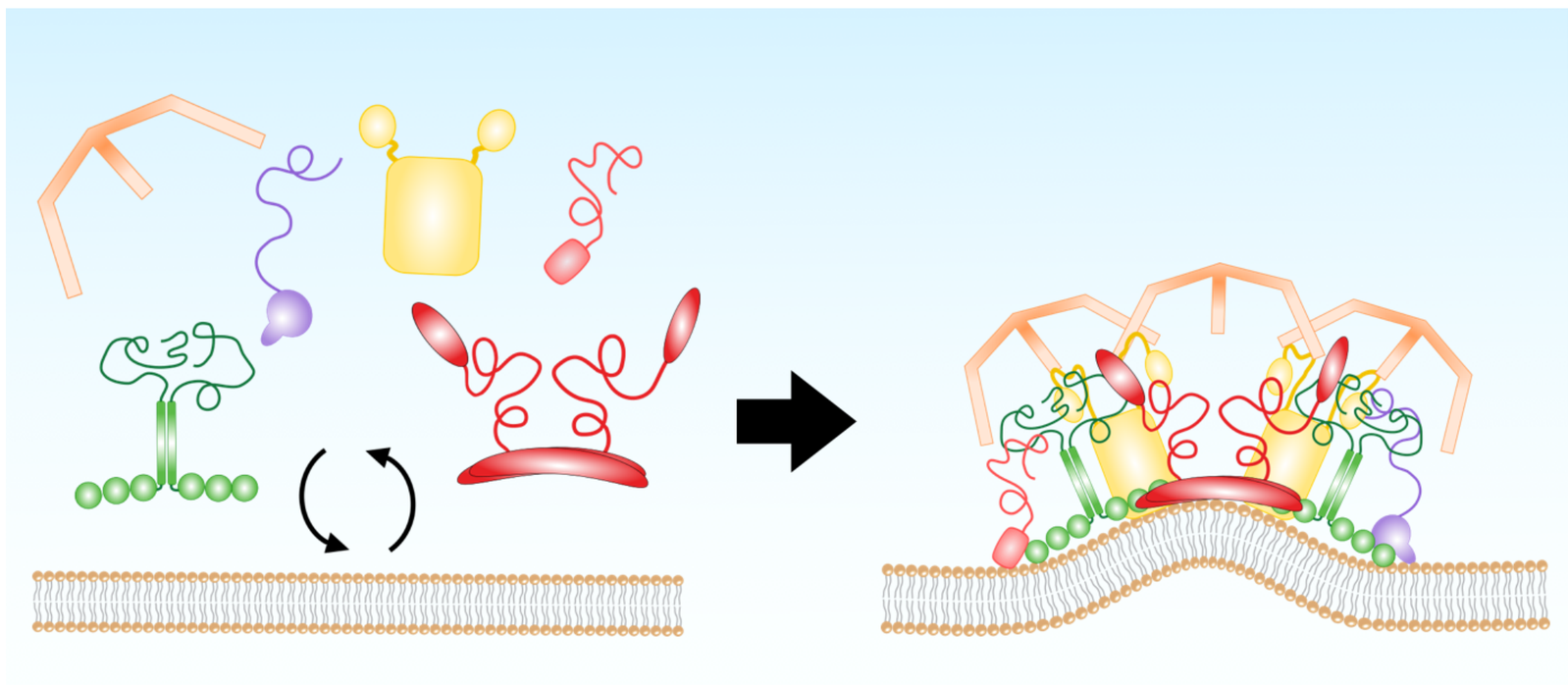
Intrinsically Disordered Proteins as Physical Drivers of Membrane Traffic



Membrane traffic, an essential cellular process that plays a role in many human diseases, requires key biophysical steps including formation of membrane buds, loading of these buds with specific molecular cargo, and separation from the parent membrane through the process of membrane fission. While intrinsically-disordered proteins (IDPs) have been regarded primarily as flexible biochemical scaffolds, we have recently discovered that IDPs are highly efficient physical drivers of membrane budding fission. We found that disordered domains generate entropic pressure at membrane surfaces, which is critical to overcoming key biophysical barriers to membrane traffic, and they form networks that condense to protein liquid droplets. Our results demonstrate that these liquid networks play unique roles in catalyzing the assembly of endocytic vesicles and shaping membrane tubules. Taken together, these results suggest a paradox - proteins that lack a defined structure, IDPs, may be among the most potent regulators of the structures of membrane surfaces.