

# Math Colloquium

## Towards the Computational Design of Smart Nano-Carriers

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Thursday

April  
16th

4:30pm - 5:30pm

LeConte 412

Membrane fusion is a potentially efficient strategy for the delivery of macromolecular therapeutics into the cell cytoplasm. However, existing nano-carriers formulated to induce membrane fusion suffer from a key limitation: the high concentrations of fusogenic lipids needed to cross cellular membrane barriers lead to toxicity *in vivo*.

To overcome this limitation, we are developing complimentary *in silico* and *in vitro* models that will explore the use of membrane phase separation to achieve efficient membrane fusion with minimal concentrations of fusion-inducing lipids and therefore reduced toxicity. The *in silico* research will be based on a novel multiphysics model formulated in terms of partial differential equations posed on evolving surfaces.