

# **Membrane Fission:**

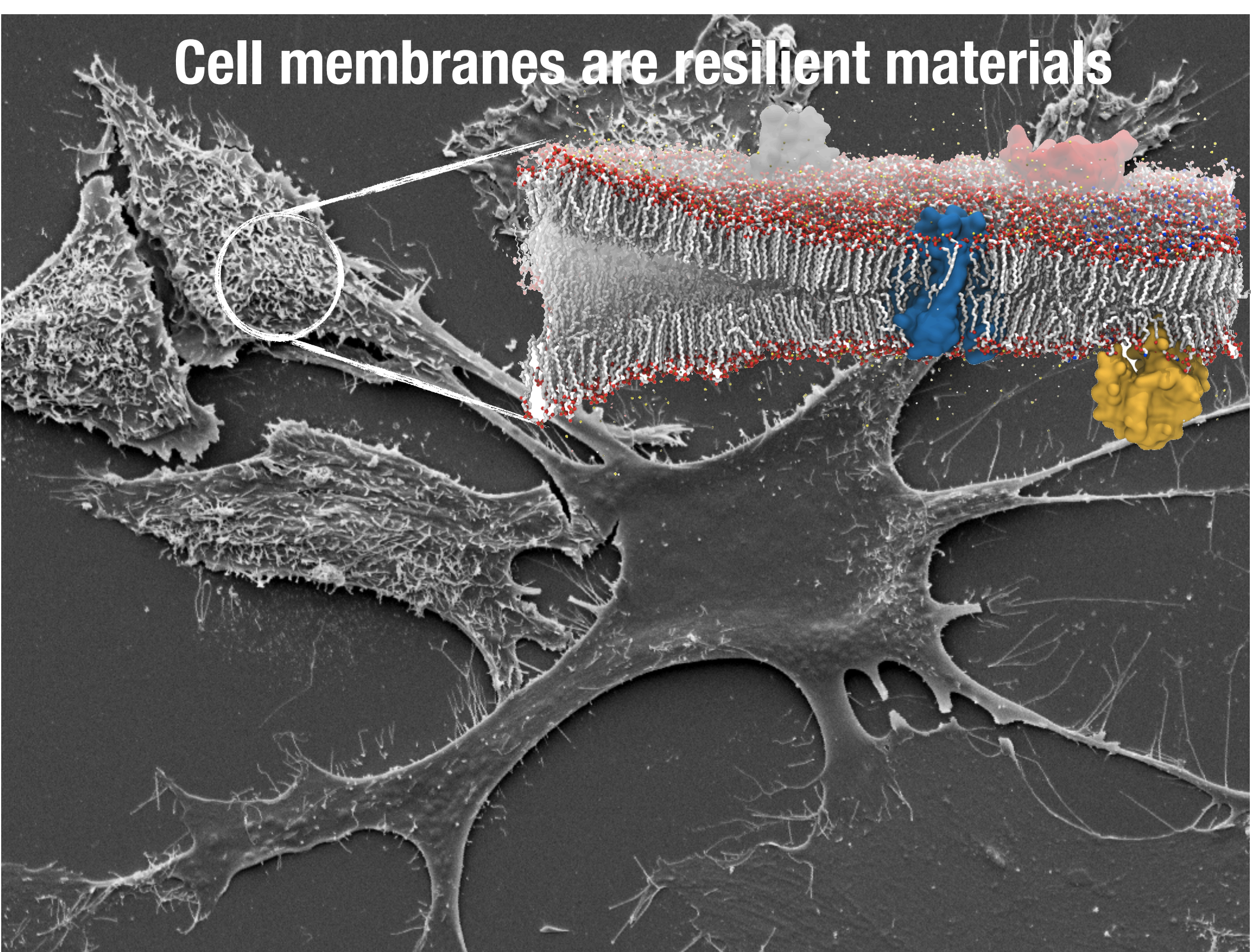
## **Diverse Players, Convergent Mechanisms**

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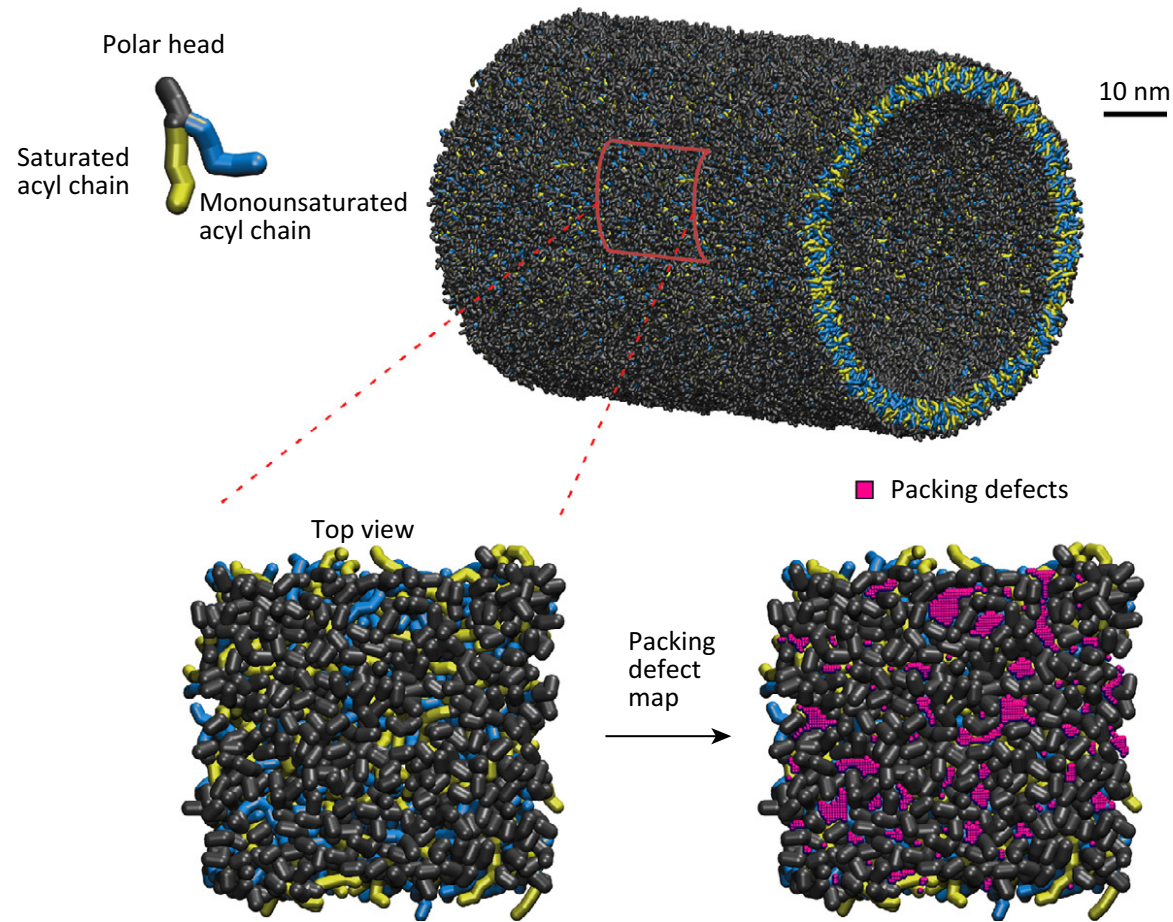
**[pucadyil@iiserpune.ac.in](mailto:pucadyil@iiserpune.ac.in)**

**Cell membranes are resilient materials**





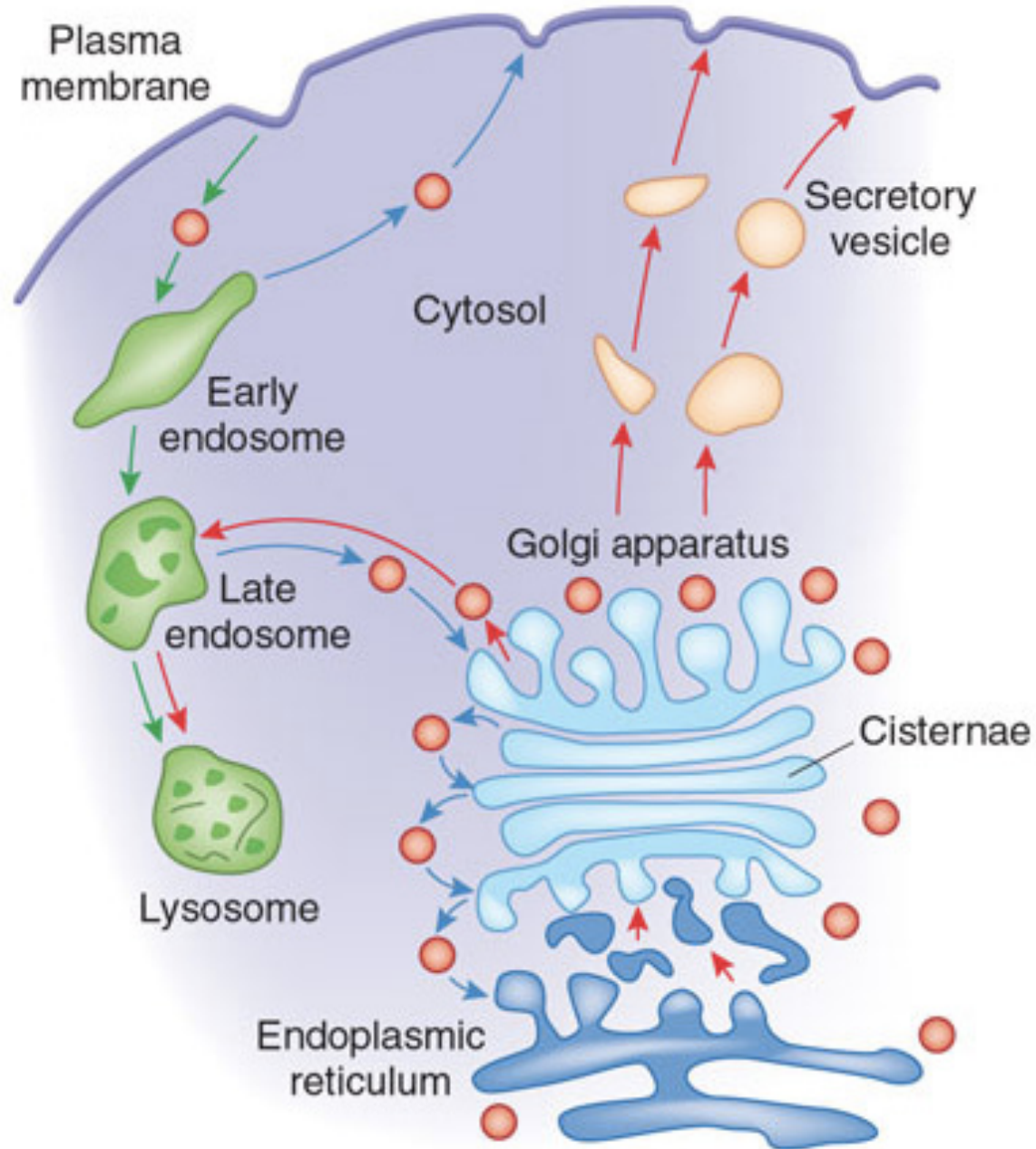
# The hydrophobic effect ensures resilience



*TRENDS in Cell Biology*

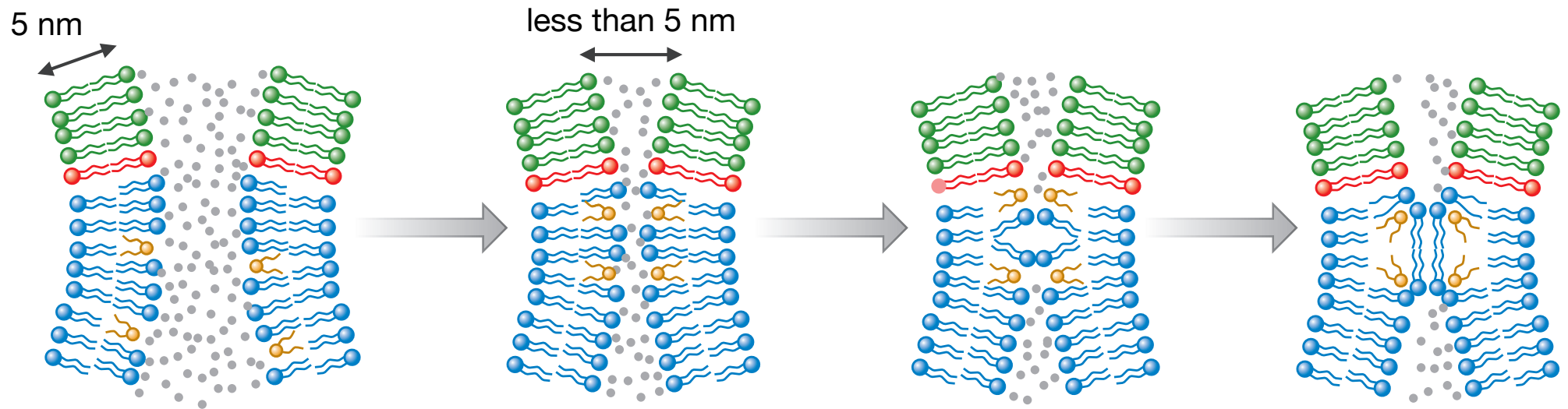
Antonny et al. (2015) Trends Cell Biol.

# How then are organelles formed ?



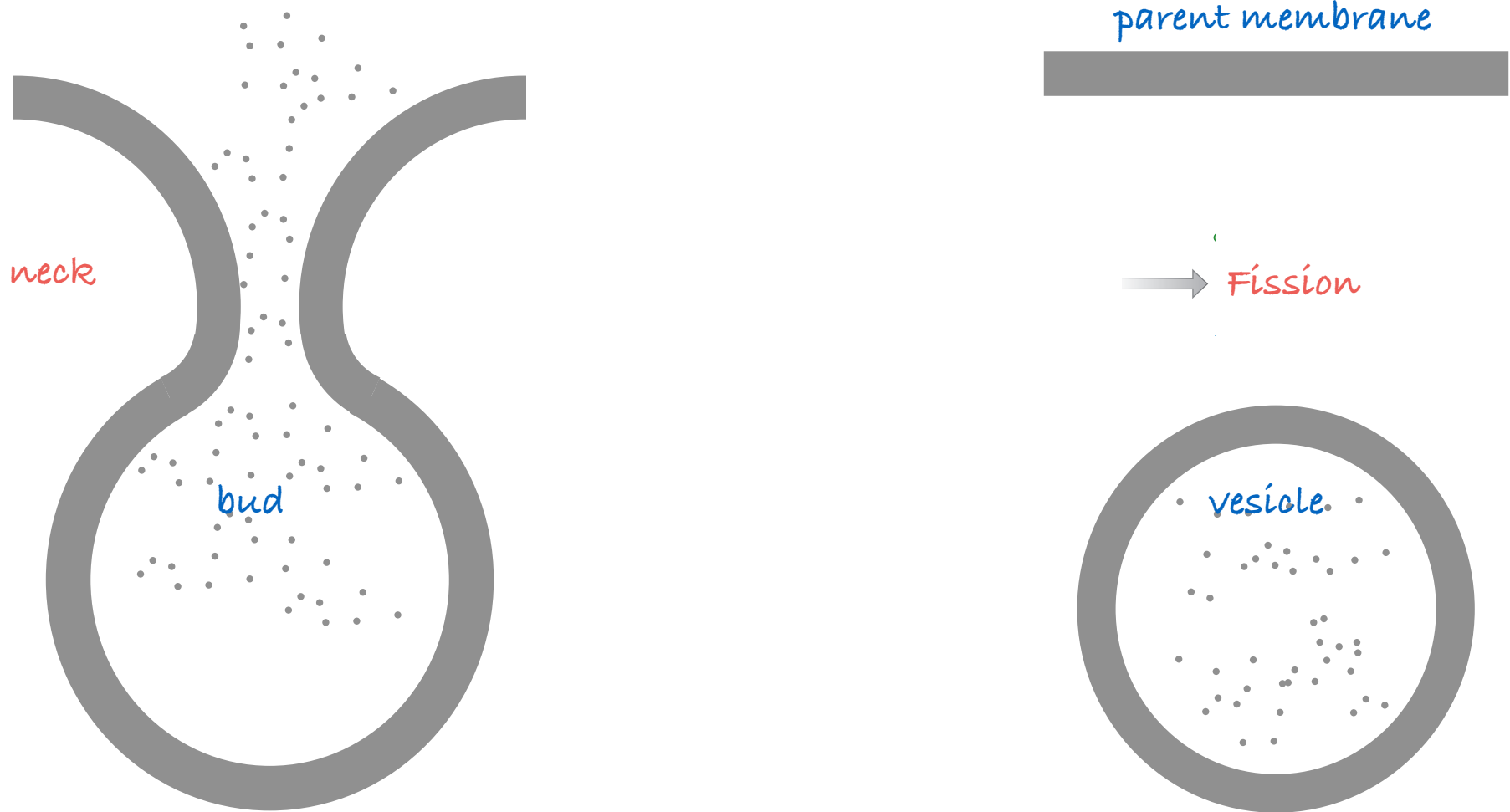


# Through membrane fission



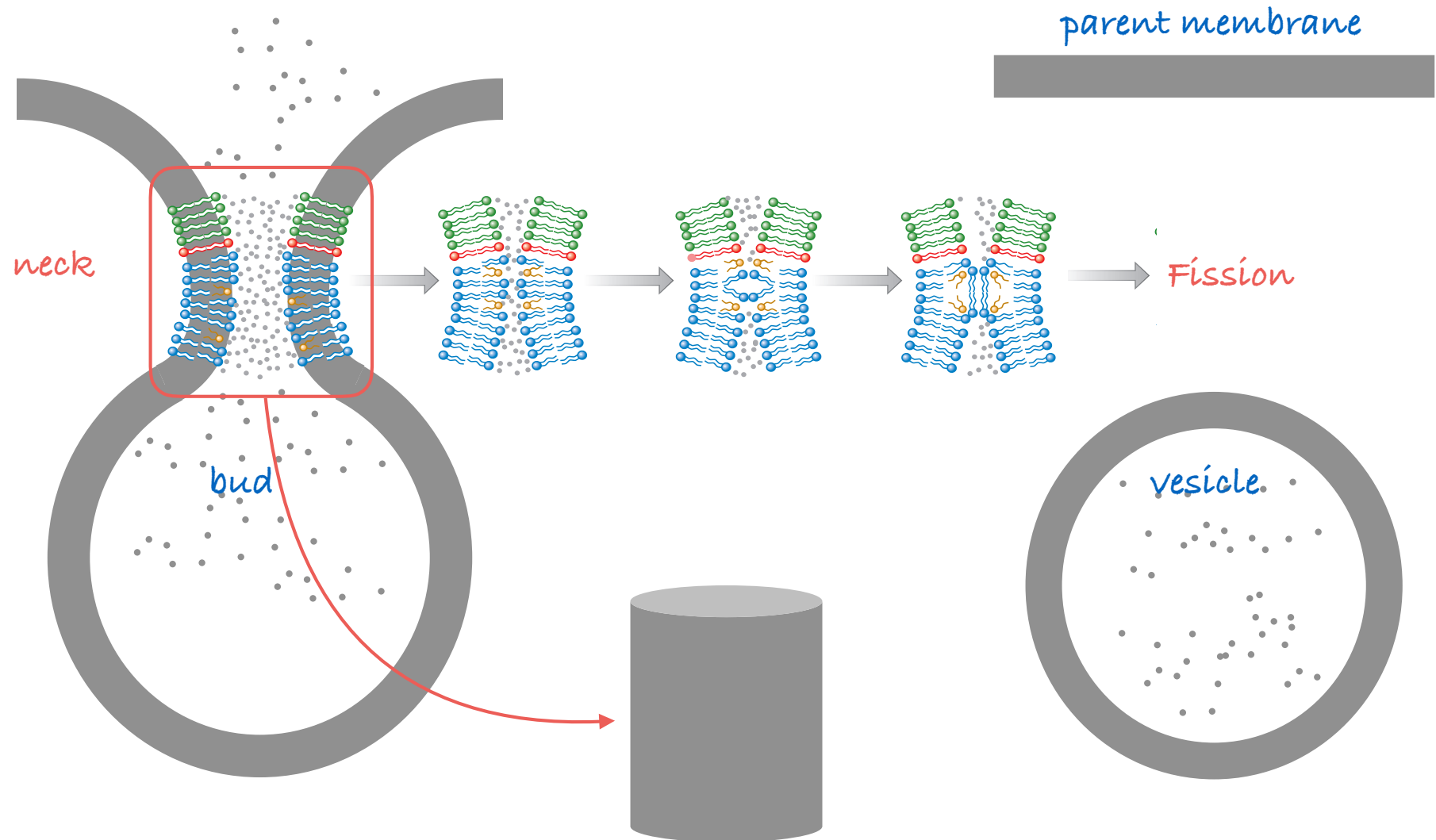
Thus, the critical intermediates can be reached by more than one mechanism

# A bottom-up approach to analyze membrane fission



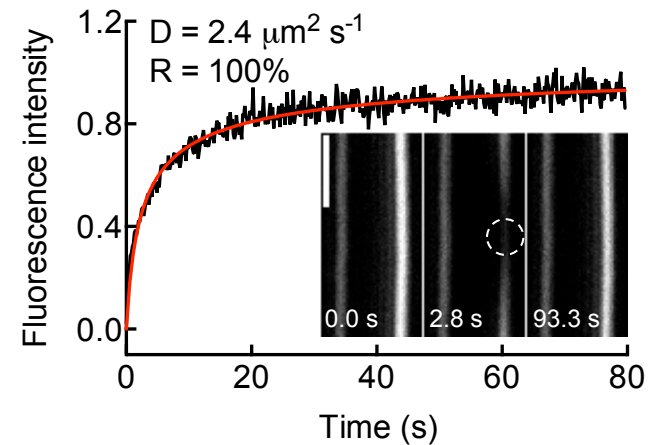
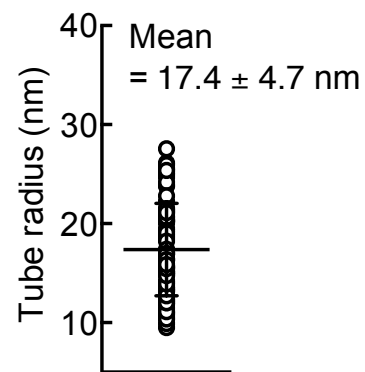
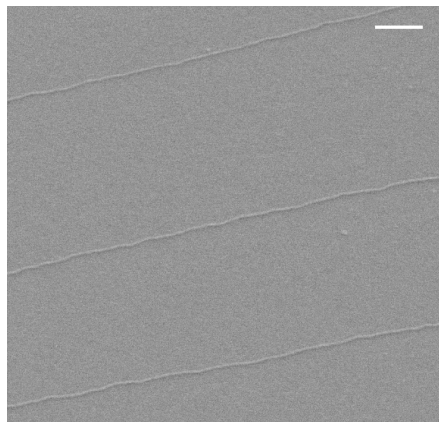
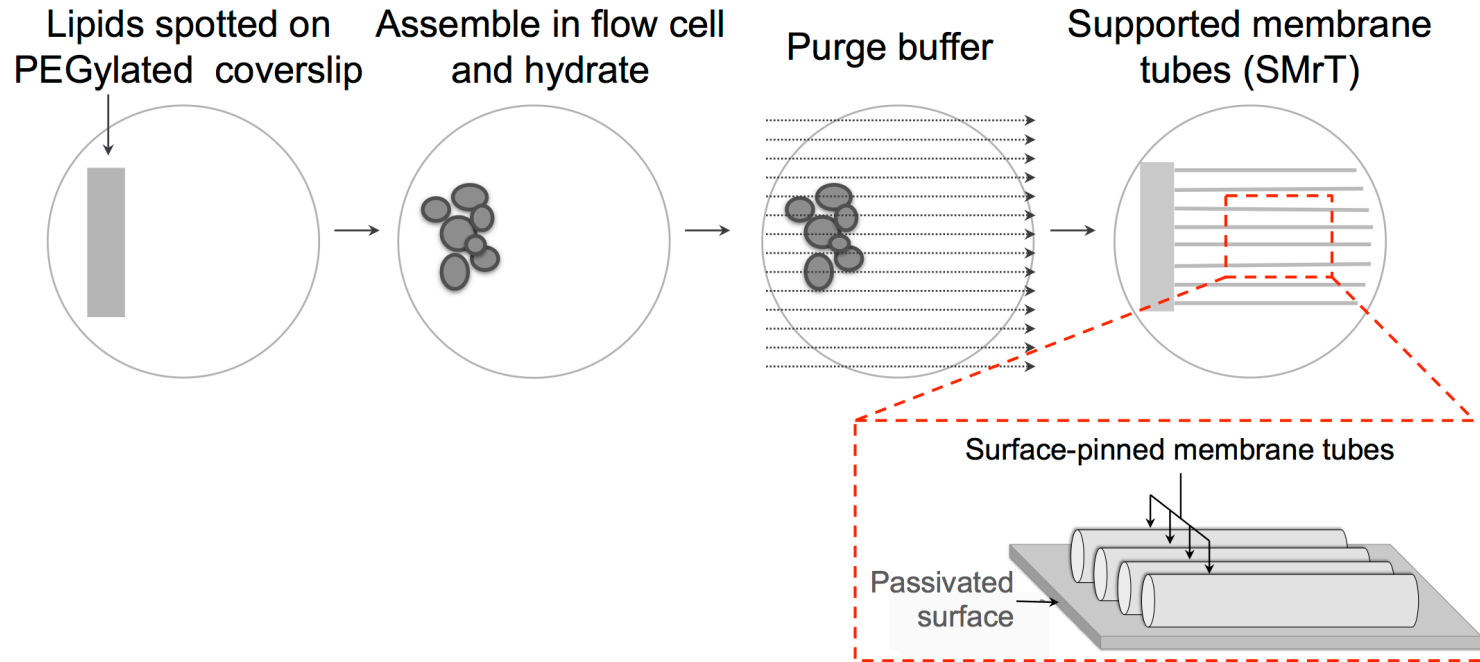


# A bottom-up approach to analyze membrane fission



Neck can be approximated as a membrane tube

# 'Clean' substrates for fission





# Typical workflow

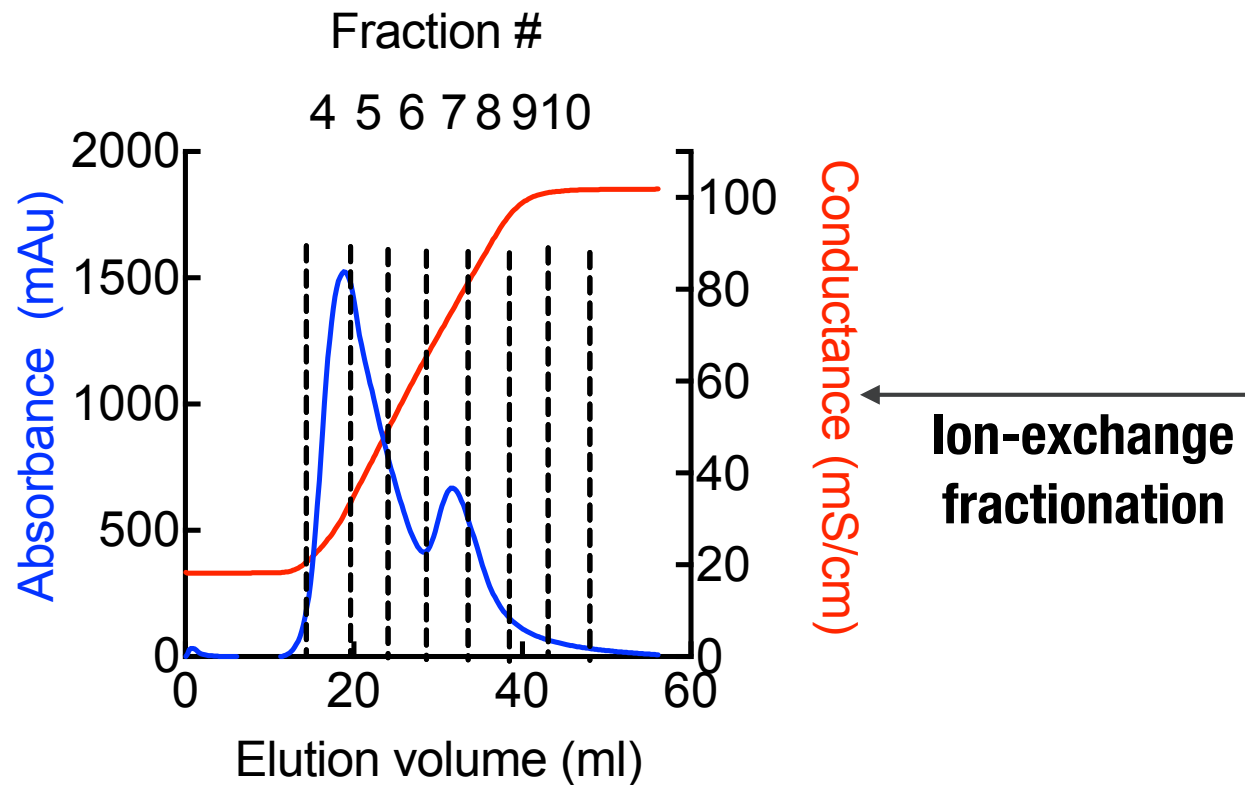


Homogenize  
and spin at high  
speed to pellet  
membranes

**Supernatant**

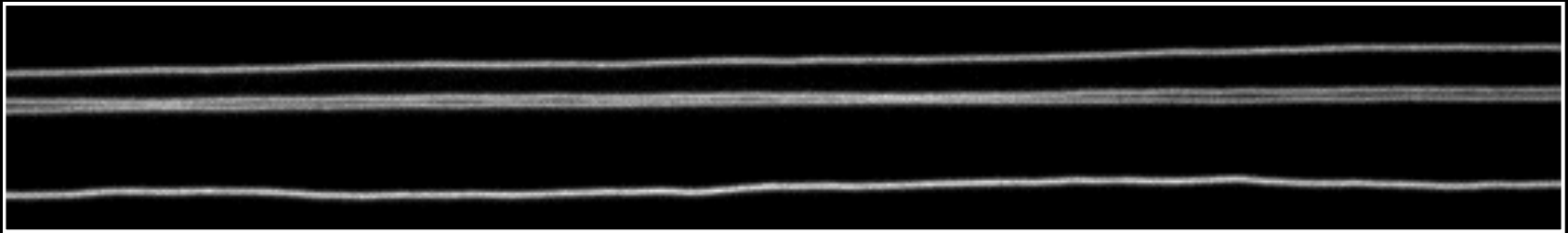
Desalt to  
remove  
metabolites  
and nucleotides

**Cytosol**

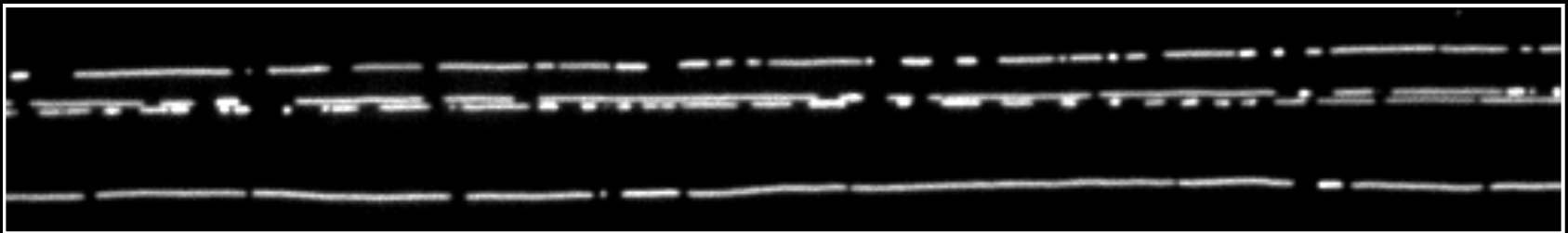


# Clean substrates give clean read-outs

**Before**

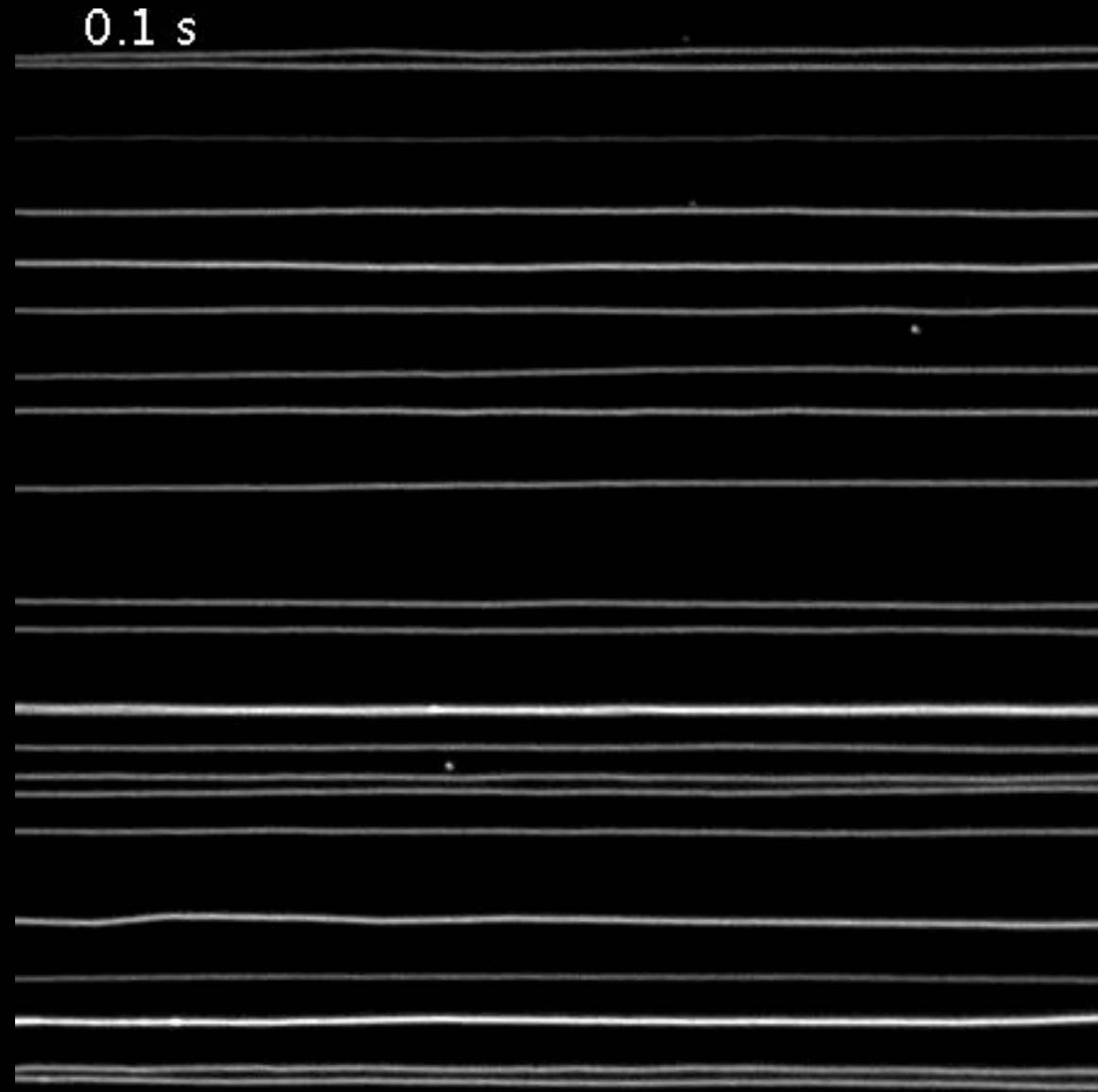


**After fission**

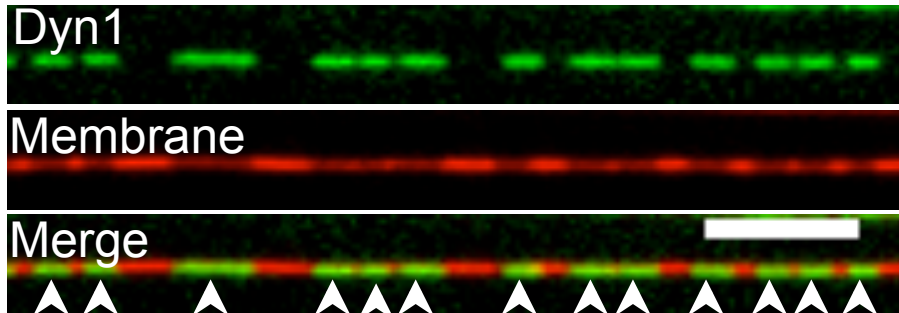




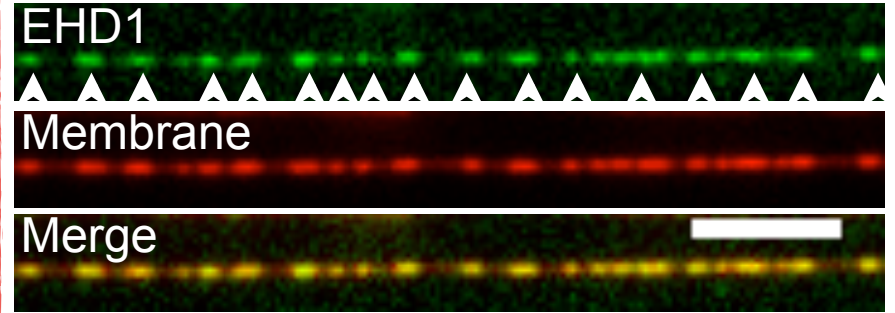
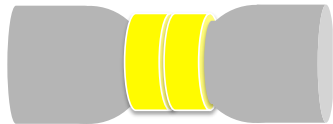
# Dynamin added in presence of GTP



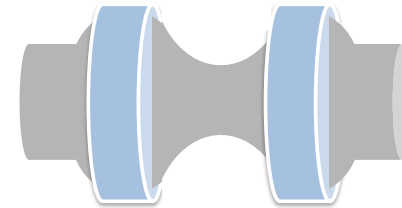
# Two fission proteins - different membrane intermediates



Dynamin assembles and constricts the underlying membrane tube



EHD assembles and bulges out the underlying membrane tube





# Acknowledgements





# Acknowledgements

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