

Abstract Submitted
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Vesicle extrusion in nanopores¹ BÉLA JOÓS, MARTIN BERTRAND, SÉBASTIEN OUELLET, University of Ottawa — Monodisperse vesicles of nearly circular shape or liposomes are used as drug delivery systems. Their fabrication involves repeated passage of large vesicles through small pores. At each passage the vesicle ruptures and the fragments reform into smaller vesicles. We report on the last stages of the process where small liposomes are pushed by pressure differences into nano-sized pores, and we study the stress distribution along the lipid bilayer to determine the rupture lines. This is done by performing coarse grained Molecular Dynamics simulations. We have developed a technique to measure the stress in the membrane based on a tessellation of the surface which allows us to monitor the local area per lipid fluctuations. The results show subtle and complex flow phenomena. We can predict the final size distribution after many passages. Comparisons will be made with existing experimental data.

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