

Abstract Submitted  
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**Lipid tubule growth by osmotic pressure** PADMINI RANGA-MANI, University of California, Berkeley, DI ZHANG, University of Washington, GEORGE ORSTER, University of California, Berkeley, AMY SHEN, University of Washington — We present here a procedure for growing lipid tubules in vitro. This method allows us to grow tubules of consistent shape and structure and thus can be a useful tool for nano-engineering applications. There are three stages during the tubule growth process: initiation, elongation and termination. Balancing the forces that act on the tubule head shows that the growth of tubules during the elongation phase depends on the balance between osmotic pressure and the viscous drag exerted on the membrane from the substrate and the external fluid. Using a combination of mathematical modeling and experiment, we identify the key forces that control tubule growth during the elongation phase.

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