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Why Myelins Form: Shape Instability of Flat Lamellae Due to Interlayer Repulsion JUNG-REN HUANG, University of Chicago, THOMAS WITTEN, University of Chicago — We show theoretically that a multilamellar tube (myelin) may be more stable than a flat lamellar stack as a result of interlayer repulsion. This is a direct consequence of the geometrical confinement: Given the same amount of lipid and water, the tube morphology allows larger spacing and hence lower interlayer repulsion than a flat lamella. For example, a confined 200-layer lamellar DMPC stack is unstable and favors the formation of myelin tubes when the interlayer repulsion arising from the confinement is greater than 0.3atm. Our finding may provide an explanation for the myelin formation often seen during the dissolution of dry surfactants.

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