

Abstract Submitted  
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**Theory of Myelin Coiling** JUNG-REN HUANG, THOMAS WITTEN,  
University of Chicago — We propose a new model to explain coiling of myelins composed of fluid bilayers. This model allows the bilayer cylinders of a myelin to be non-coaxial and the bilayer lateral tension to vary from bilayer to bilayer. Our calculations suggest that a myelin would bend or coil to lower its free energy when the bilayer lateral tension is sufficiently large. The proposed coiling mechanism is in a sense similar to the classical Euler buckling of a thin elastic rod subject to axial compression. The analysis of a simple two-bilayer case shows that a bilayer lateral tension of about 1 dyne/cm can easily induce coiling of myelins of typical lipid bilayers. This model signifies the importance of bilayer lateral tension in determining the morphology of myelinic structures.

Jung-Ren Huang  
University of Chicago

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