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The Role of Osmotically-induced Tension in Binding of N-BAR to Lipid Vesicles ANTHONY D. DINSMORE, Univ. of Mass. Amherst, JAIME B. HUTCHISON, University of Texas, Austin, DEREK A. WOOD, ROBERT M. WEIS, Univ. of Mass. Amherst — We measured the binding affinity of a curvature-sensing protein domain (N-BAR) as a function of applied membrane tension while the membrane curvature was held nearly constant. We focus on the N-BAR domain of Drosophila amphiphysin, which participates in a range of key cell functions including synaptic vesicle endocytosis. We monitored N-BAR binding on unilamellar vesicles composed of 90 mol% DOPC and 10 mol% PIP. Controlled tension was applied by osmotic stress. We found that the bound fraction of N-BAR was enhanced by a factor 6.5 when the tension increased from zero to 2.6 mN/m. This tension-induced response can be explained by the hydrophobic insertion mechanism with a hydrophobic domain area that is consistent with known structure. These results suggest that membrane strain might explain the previously reported curvature affinity of N-BAR. This work was supported by the National Science Foundation through grant DMR-0907195.

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