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Wrinkled Membrane Morphology of Biological Cell LIFENG WANG, Massachusetts Institute of Technology, CARLOS CASTRO, MARY BOYCE — Membranes of many biological cells possess a wrinkled surface topology that, in some instance, serves as a reservoir for providing large surface area and membrane expansion during osmotic swelling. We consider and model the development of the wrinkled morphology to result from buckling instabilities which occur during the membrane growth. In particular, we examine the wrinkled membrane morphology of white blood cell experimentally and numerically. Our results show that the deformation mismatch between the membrane and the cytoskeleton during membrane growth triggers buckling of the membrane. This behavior of the wrinkled topology enables expansion of the cell during swelling and reveals interesting details on the role of the membrane topology.

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