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CORRECTION

Correction to: Forces and Flows at Cell Surfaces

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The original version of this article unfortunately contained Abstract and keywords, and missed to include the author's photo and introduction section by Associate Editor.

For articles of type "Up-and-Coming Scientist," there are no Abstract section and keywords. Instead, the photo of the author and the introduction section must be included in the article as shown below:

Introduction by Damien Thévenin, Associate Editor

I am delighted and honored to introduce the following essay by Dr. Aurelia Honerkamp-Smith, an Assistant Professor in the Department of Physics at Lehigh University, in this issue's 'Up-and-Coming Scientist' section. Dr. Aurelia Honerkamp-Smith earned a B.S. in Chemistry from the University of Oregon in Eugene, OR, and a Ph.D. in Physical Chemistry from the University of Washington in Seattle, WA, where she used fluorescence microscopy to study lipid phase transitions with Prof. Sarah L. Keller. As a postdoctoral researcher in Prof. Raymond E. Goldstein's laboratory in the Dept. of Applied Mathematics and Theoretical Physics at the University of Cambridge, she directed her interests in microfluidics, micromanipulation, and light-sheet microscopy toward making mechanical measurements on lipid membranes and cell sheets. In this essay, Dr. Honerkamp-Smith discusses recent developments in membrane hydrodynamics, protein transport, and flow mechanosensing by living organisms to make the case that lipid mechanics can contribute to flow sensing. While it is well established that flow affects cellular functions, the molecular mechanisms that cells use to sense it have remained surprisingly opaque. The first steps in flow detection are likely to occur at the plasma membrane, an organized, two-dimensional molecular array with solid and fluid properties. The mobility of membrane proteins and lipids is constrained by complex interactions with the cytoskeletal protein network that supports the membrane. Physiologically relevant flows can only generate tiny forces on individual proteins, smaller than those from thermal noise. However, Dr. Honerkamp-Smith proposes that cells could overcome this problem by sensing micron-scale concentration gradients of membrane proteins sorted laterally by flow over the extracellular surface of the plasma membrane. In this context, Dr. Honerkamp-Smith also discusses the implications of her work on lipid responses to flow and how proximity to rigid surfaces modifies those responses (see for example Anthony et al. 2022, Ratajczak et al. 2023, and Miller et al. 2023, referenced in the current essay).

The original article has been corrected.

The original article can be found online at https://doi.org/10.1007/s00232-023-00293-x.

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