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Proposal Review 2 : 1803948

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Agency Name: National Science Foundation

Agency Tracking Number: **1803948**

Organization:

NSF Program: FD-Fluid Dynamics

PI/PD: Young, Yuan-Nan

Application Title: Collaborative Research: Osmophoresis: Propulsion of Semipermeable Vesicles Driven by Chemical Gradients

Rating: Good

Review

Summary

In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.

Strength: Important distinction of osmophoresis from other phoretic mechanisms and potential translation to drug delivery.

Weakness: How is it different from other phoretic mechanisms? Numerical methods are not well described. The validation of computational modeling is not well developed in connection with experiments. In Aim 2, how is it justified with constant solute permeability through multi-lamellarity? In Aim 3, some detailed biological setting of drug delivery is not well defined. The same for Reduced-order analytical models.

In the context of the five review elements, please evaluate the strengths and weaknesses of the proposal with respect to broader impacts.

Strengths: Web-based solutions and open source are promising.

Weakness: How the training will be coordinated between experiments and modeling? How the task force teams are organized?

Please evaluate the strengths and weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if applicable

Summary Statement

The distinction of osmophoresis from other phoretic mechanisms is important and shows potential translation to drug delivery. However, the validation of computational modeling is not well developed in connection with experiments.

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