Qeios

Peer Review

Review of: "Separation of Sticker-Spacer Energetics Governs the Coalescence of Metastable Condensates"

Andrew P. Latham[1]

1. University of California San Francisco, San Francisco, United States

In “Separation of sticker-spacer energetics governs the coalescence of metastable condensates,” the authors present an interesting and timely computational study of condensate fusion of sticker and spacer models. The authors uncover how slow sticker exchange can result in dynamic arrest that limits condensate fusion and show how homopolymers and heteropolymers may coalesce due to different thermodynamic considerations. The authors connect these findings to experimental studies of condensate fusion, indicating the biological relevance of their model. Below are a few minor points that may improve the manuscript:

1. The authors use metadynamics to sample condensate fusion. If computationally feasible, it may be interesting to extend a select number of these metadynamics simulations to report on the free energy for the fusion of sticker and spacer condensates.
2. It may be clearer to include a diagram in Figure 3 to represent the differences between the 4 states (C1-C4).
3. Including both Figure S9 and Figure 3C seems redundant. Could Figure 3C be replaced by Figure S9?
4. The authors change from using Rdist to describe condensate fusion (Figure 2) to using 1-Rdist to describe condensate fusion (Figure 4). Using the same metric across the entire paper could improve its clarity.

Declarations

Potential competing interests: No potential competing interests to declare.

doi.org/10.32388/W5ICVS