

Biomolecular condensates wetting membranes - dynamical insights from numerical simulations

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Biological cells use membranes and condensates (liquid-like droplets) to compartmentalize their interior. As every structure within a cell is either enclosed by a membrane or by a liquid interface it is fundamental to understand what happens if these two come into contact. Recent studies suggest that membrane-droplet interactions are involved in various key biological processes. As experimental image resolution is limited at the corresponding length and time scales, numerical methods are essential to shed light on the dynamics of the process.

Using a combination of sharp and diffuse interface models, we derive a mathematical model to describe the interplay of a thin elastic membrane with a two-phase fluid.

We demonstrate that the wetting interaction by capillary forces leads to a range of fascinating phenomena like droplet wrapping, endocytosis and an inverted cheerios effect.

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Sitzung Einordnung: Short Talks