BIOMIMETIC DROPLETS FOR BIO-MATERIALS

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Droplets are ubiquitous and important in biological systems; they are also widely used as templates for generating artificial bio-materials, for instance, as drug delivery vehicles and tissue scaffolds. To achieve the required immiscibility between the droplet and the continuous phases, air/water and water/oil systems are commonly used. In biological liquid phases, which are typically made up of aqueous solutions, droplets are also observed. For instance, droplets are observed in oocytes of Xenopus frogs and germ cells of C. elegans. This suggests that oil-free, or organic-solvent-free aqueous/aqueous droplets remain inadequately understood or investigated. In this talk, I will discuss our efforts in investigating the physico-chemical and interfacial properties of aqueous two-phase systems, and studying how bio-mimetic behaviors, such as budding, can be induced in aqueous-aqueous droplets. Our findings are potentially relevant in biological systems and may inspire new strategies to formulate novel functional biomaterials.

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