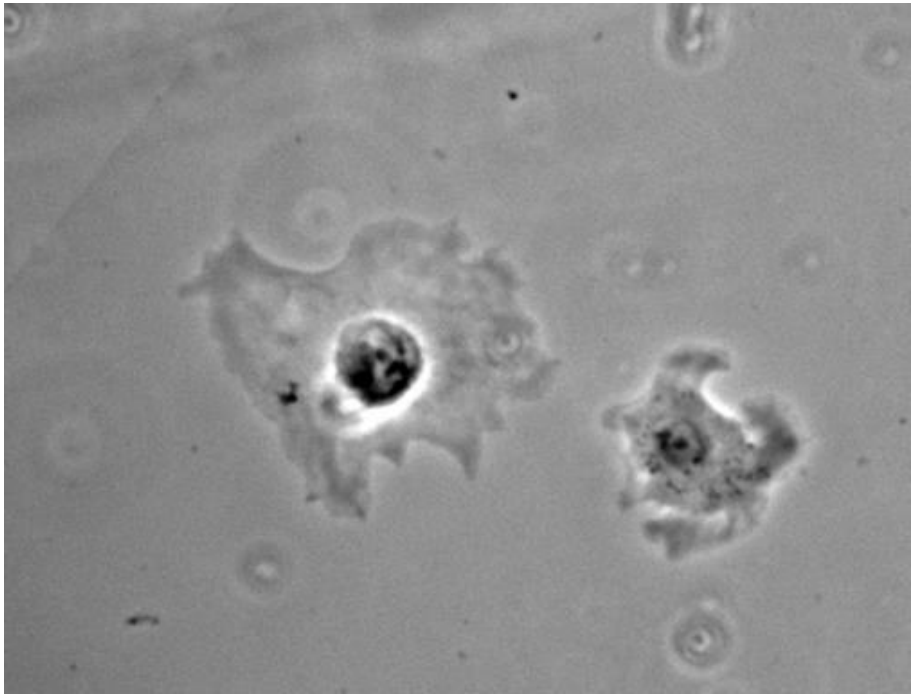
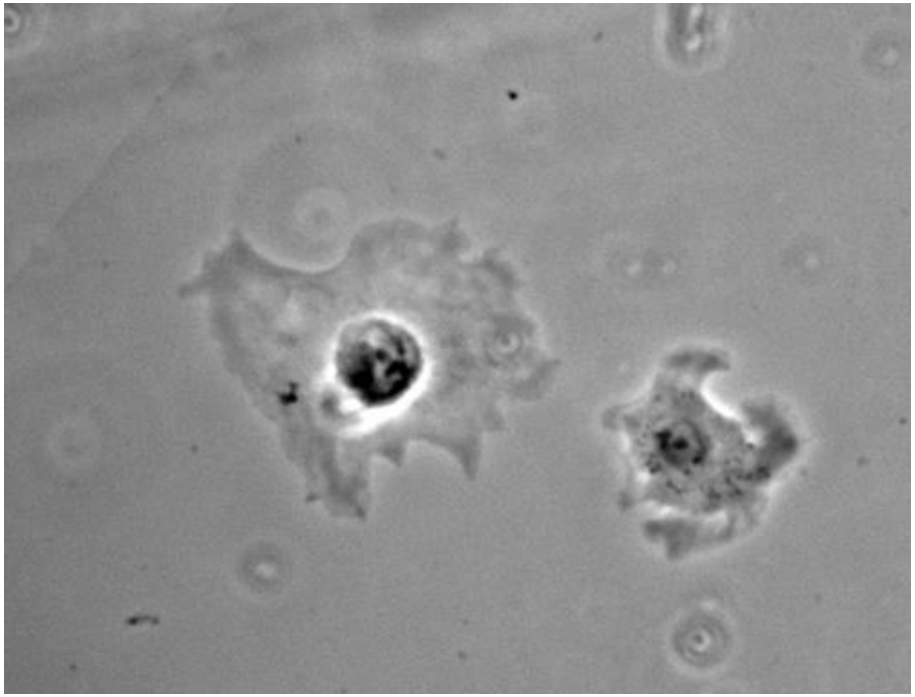
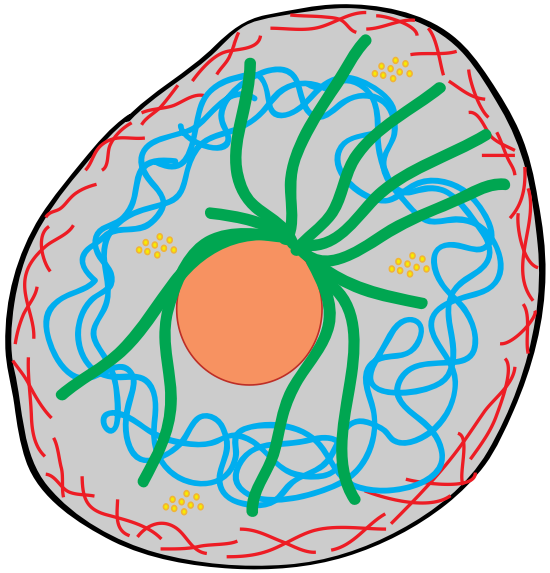


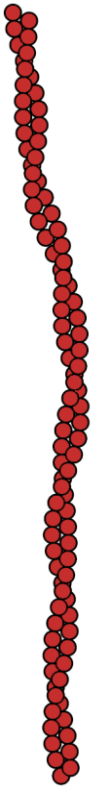
Active, biological materials

Gardel Lab

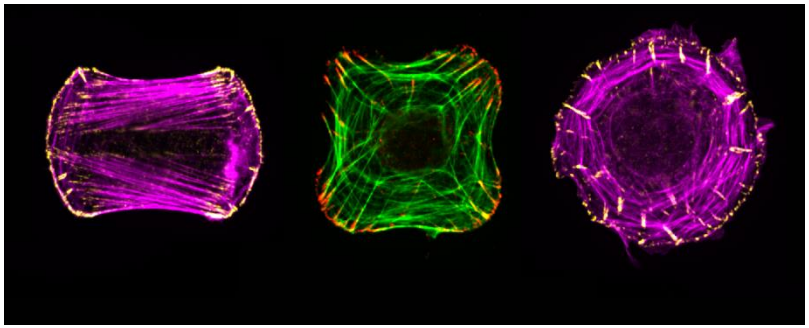
Soft, biologically inspired materials



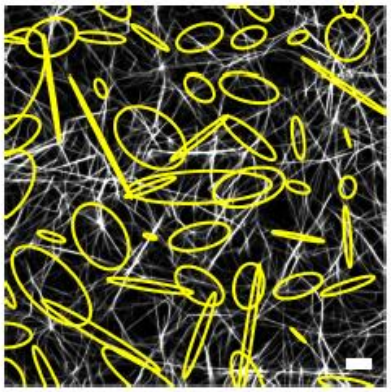


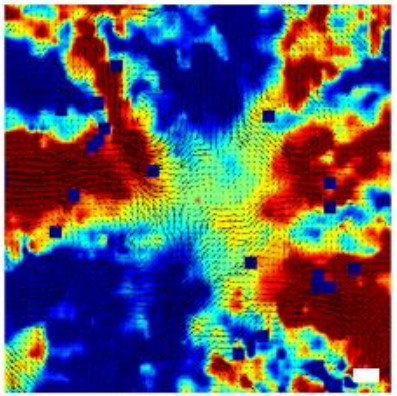


Soft, biologically inspired materials



Patrick Oakes





Samantha Stam

How do soft, active materials self-organize?

Mitotic spindle

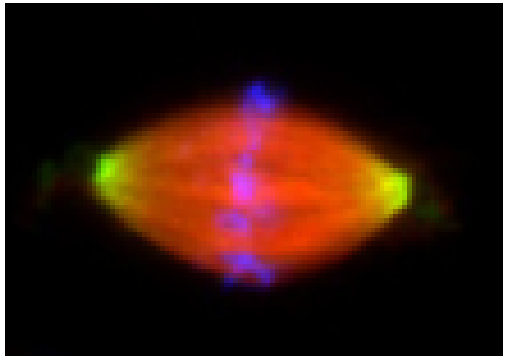
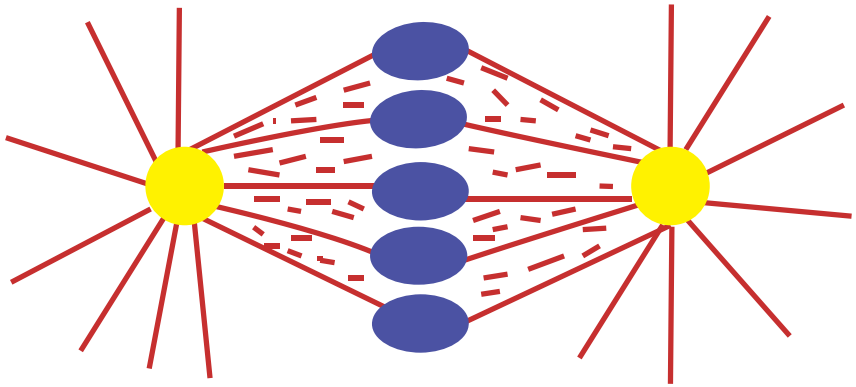


Image: Torsten Wittmann



Muscle sarcomere

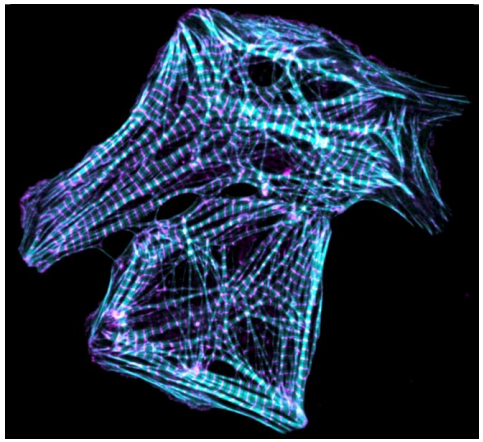
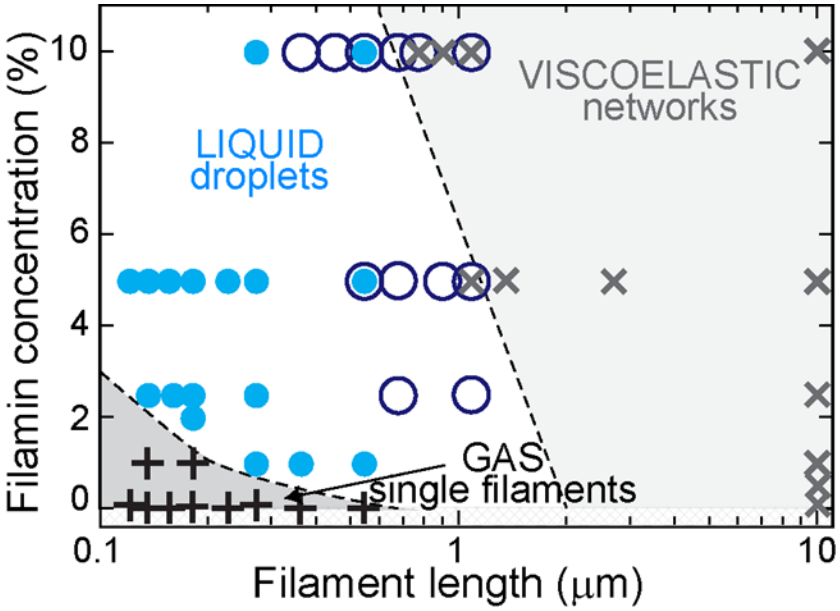


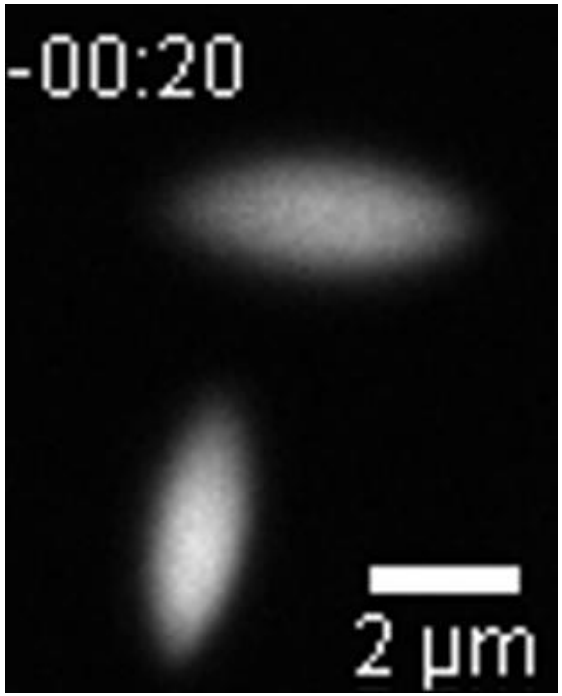
Image: Barbara Hissa

Approach: liquid biopolymer droplets

Short, dilute filaments

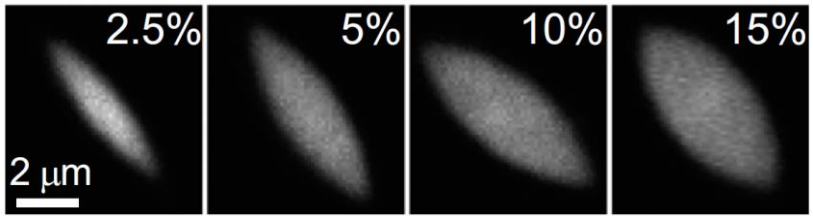
Impose filament interactions



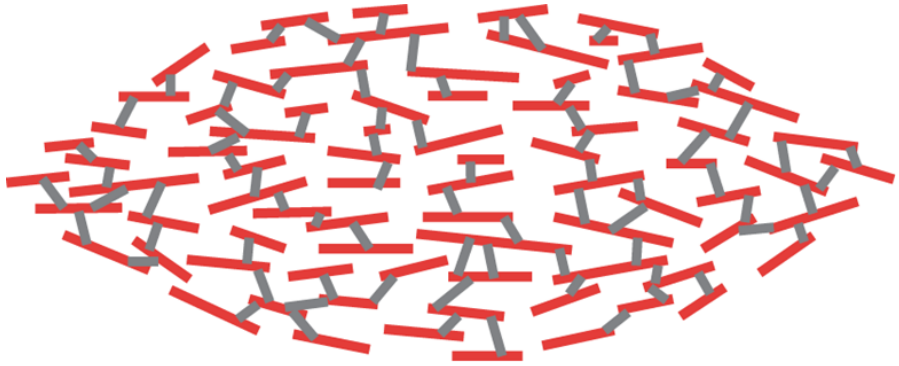


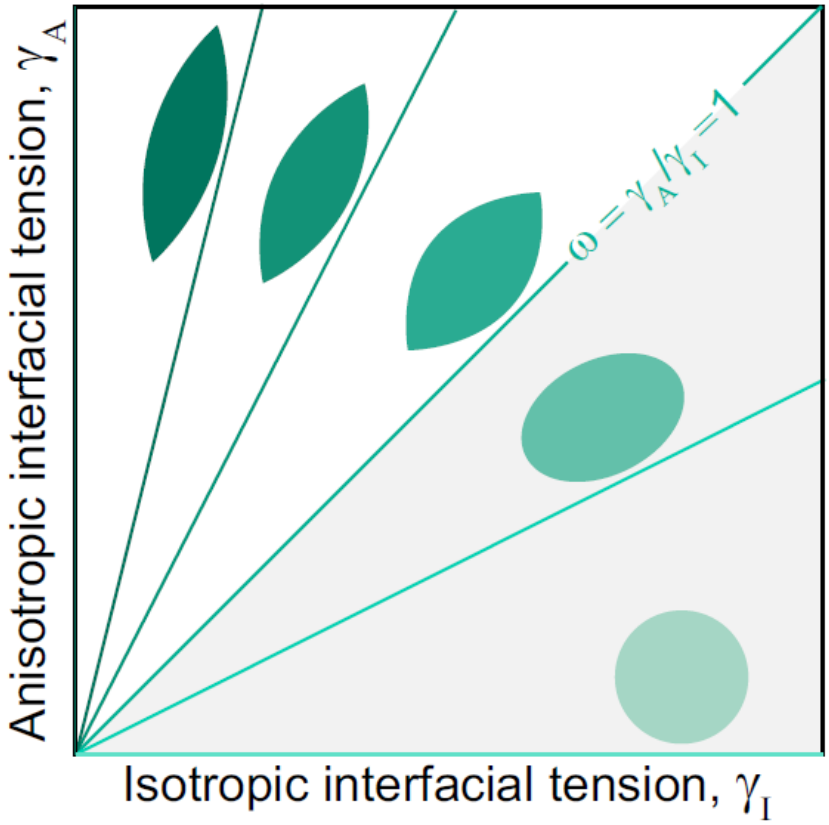
Weirich, Banerjee, Dasbiswas, Witten, Vaikuntanathan & Gardel, *PNAS* 2017

Droplet shape is controlled by anistropy



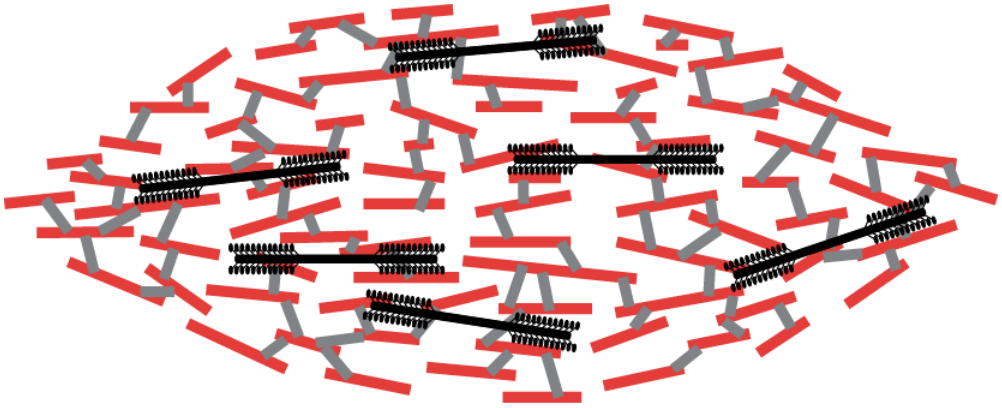
$$E_{\text{droplet}} = \gamma_{\text{Isotropic}} + \gamma_{\text{Anisotropic}}$$

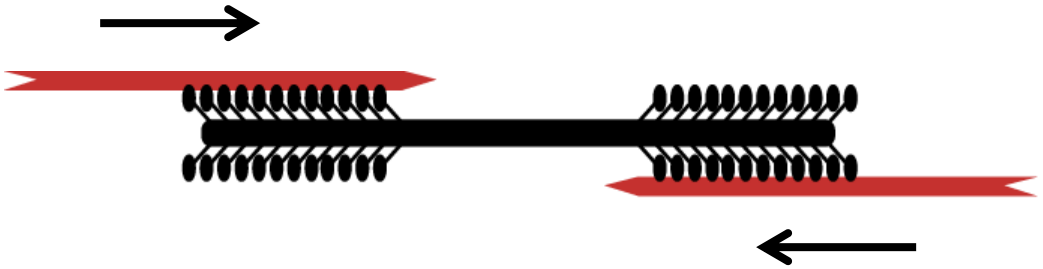




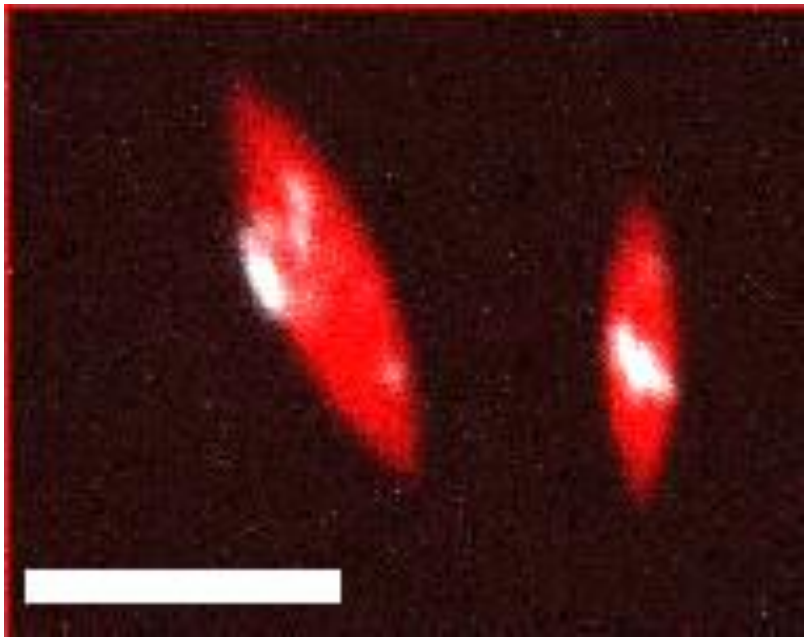
Weirich, Banerjee, Dasbiswas, Witten, Vaikuntanathan & Gardel, *PNAS* 2017

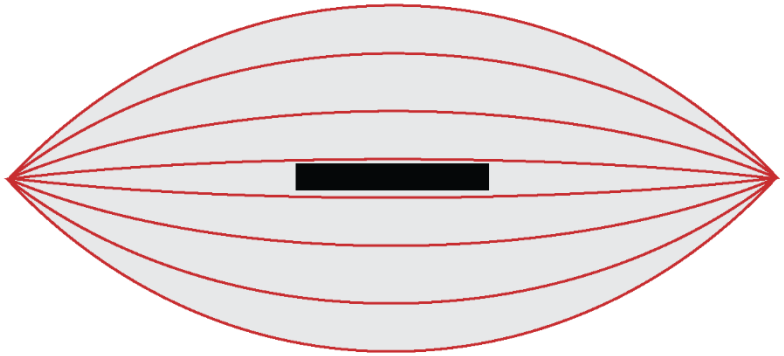
Can anisotropy drive self-organization in biomaterials?



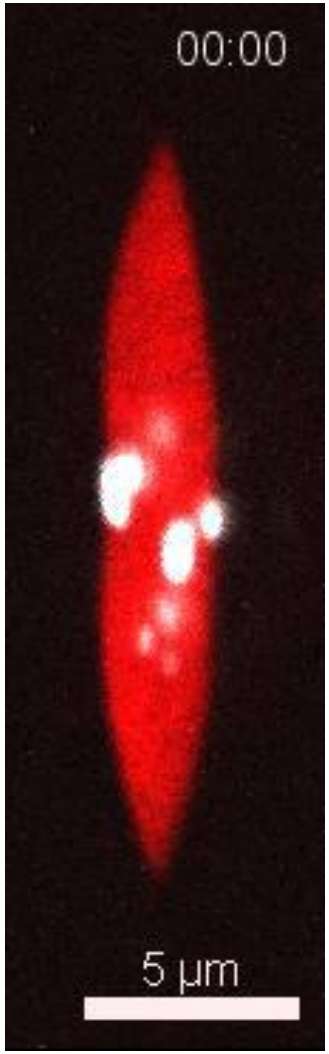


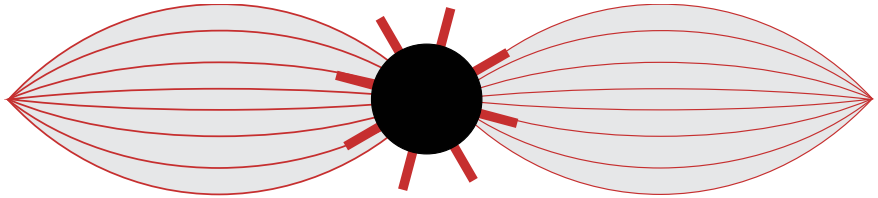
What drives particles to self-organize in a droplet?





What is the role of the particle activity?





$$E = E_{\text{droplet}} + E_{\text{align}} + E_{\text{adhesion}}$$