

Materials Research Science and Engineering Centers (Princeton MRSEC 1420541)

iSuper-Seed: Harnessing the Rules of Life to Enable Bio-Inspired Soft Materials

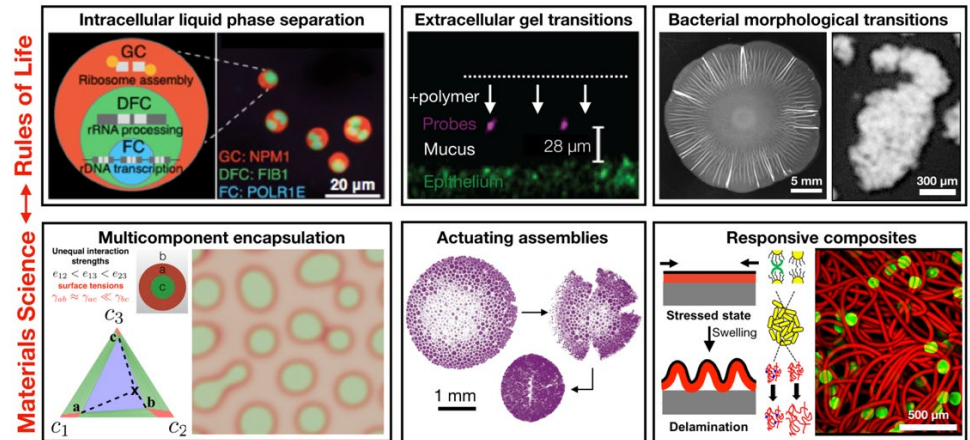
DMR MRSEC Program

Vision: Connect material science of soft composites to the sub-cellular and super-cellular structures that give biological function and shape.

Starting point: Polymers entropically regulate the structure and function of biological systems, ranging from sub-cellular proteins to extra-cellular hydrogels to multi-cellular communities.

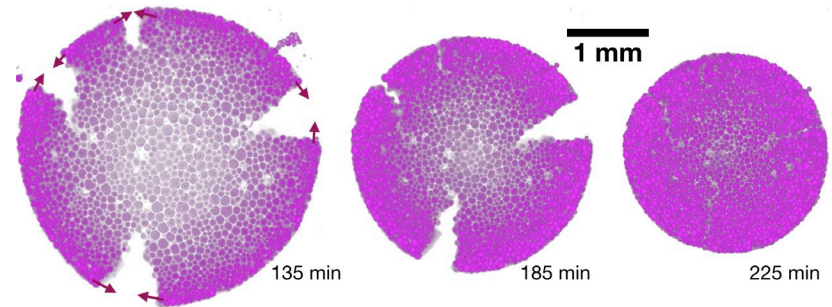
Goals:

- (1) Define principles governing how living systems use polymers to regulate structure and function.
- (2) Control multi-scale structural transitions in soft materials.
- (3) Design novel multi-functional bio-inspired soft materials.



Top row: Polymeric interactions in living systems.

Bottom row: Material science innovations inspired by the Rules of Life or applied to understand some rules of life.



Hydrogel particle assembly, mimicking a biological tissue, undergoing large deformations due to drying-induced differential shrinkage.