Equilibrium mechanisms of self-limiting assembly

The vast majority of equilibrium assembly processes give rise to two states: one consisting of dispersed disassociated subunits and the other consisting of a bulk-condensed state of unlimited size. The Brandeis MRSEC focuses on the more specialized class of self-limiting assembly, which describes equilibrium assembly processes resulting in finite-size structures. These systems pose a generic and basic question, how do thermo-dynamic processes involving non-covalent interactions between identical sub-units "measure" and select the size of assembled structures?

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Schematic illustrations of two classes of selflimiting assembly. (a) Self-closing assembly, in which inter-subunit rotations lead to cohesive assembly into closed, boundary-free aggregations. (b) Open-boundary (self-limiting) assembly, in which intra-aggregate stress accumulates with assembly and restrains the cohesive drive toward unlimited size.



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