# Text S3 Assembly Regime Criteria

We demarcate various assembly regimes by using the following values: the yield of the complex at thermodynamic equilibrium, or , the yield of the complex after , or , and the mean size (in number of components) of the intermediates after and number of components in a complex, or and , respectively. Table S2 shows the specific criteria for demarcating assembly regimes.

**Above of complex**

Molecular engineers can effectively design complexes (usually the target end product of self-assembly) using thermodynamic principles to have a low free energy and thus achieve high yields after very long assembly times (). So designing complexes that are not stable or subjecting components to assembly conditions that give is unfavorable from an engineering perspective and hence assigned a red label in our plots.

**Nucleation-limited conditions**

Nucleation-limited conditions thermodynamically favor complex formation () but weak component-component interactions limit yields (). Under these conditions the mean intermediate size (in number of components) is less than or equal to half of the size of the complex after (or , see Figure S15), suggesting that nucleation is the primary growth mechanism of complex assembly.

**Assembly funnel**

The regime where an assembly funnel is present (the assembly funnel regime) is the most favorable regime of assembly, where complexes are highly thermodynamically favored () and complexes form rapidly enough to achieve high-yield in finite times ().

**Parallel assembly pathway and rearrangement-limited conditions**

The parallel assembly pathway and rearrangement-limited regime occurs when complexes are highly thermodynamically favored () but the dynamics of assembly are slow (). Additionally, under these conditions the mean intermediate size (in number of components) is greater than half of the size of the complex after (or , see Figure S15), suggesting that the rearrangement of components between intermediates is necessary to form complexes.