Multicompartment Micelles from ABC Triblock Terpolymers

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The desire to mimic complex processes and structures found in nature has been a driving force for research by many groups for decades. Self-assembly of block copolymers is one of the most promising paths towards hierarchical super structures. This bottom-up approach allows the directed aggregation of e.g. block copolymers into thermodynamically stable or kinetically trapped constructs with rich architecture, complex fine structure and versatile functionality.

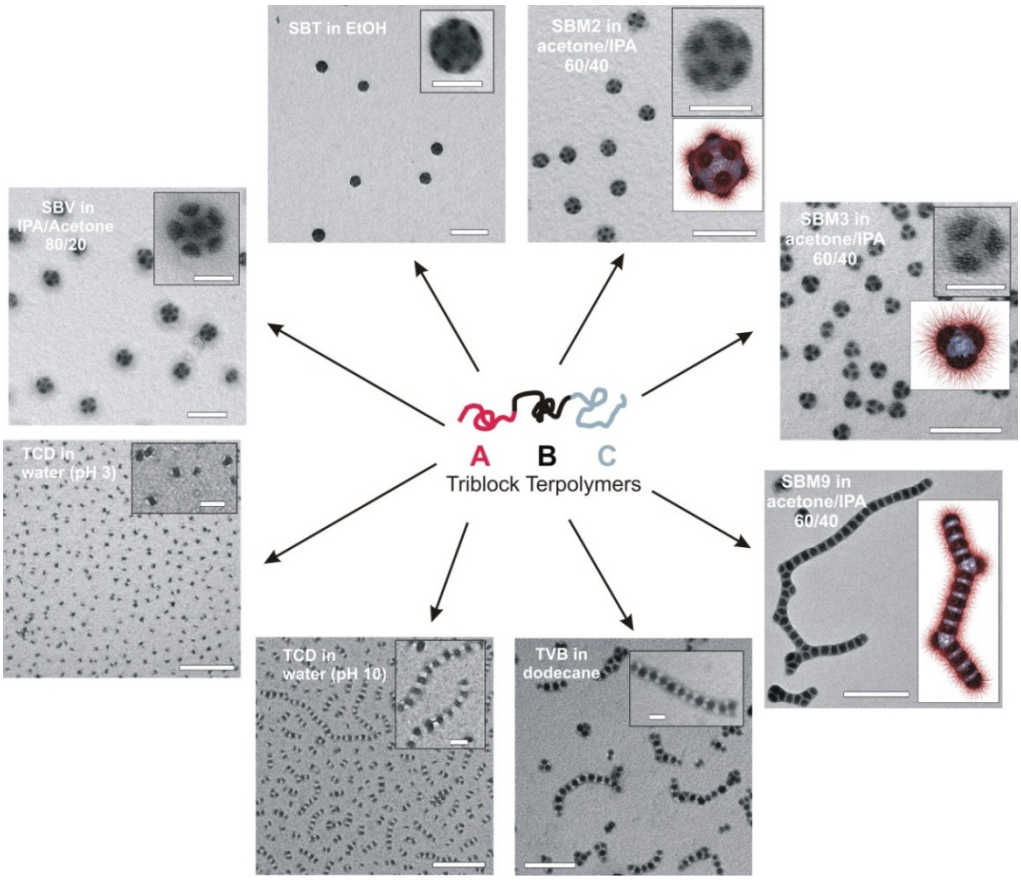

Figure 1: Multicompartment micelles via obtained via a simple solvent-based process.

Here we want to present a unique route for the self-assembly of ABC triblock terpolymers into multicompartment micelles (MCMs) simply by choosing the right solvent conditions and solvent sequences. The presented concept is applicable to almost any terpolymer (Figure 1) and circumvents the problems that MCMs are mostly obtained from complicated polymer architectures, with the aid of additives or specialized monomers and monomer sequences. Not only can we direct the self-assembly into MCMs, but also describe parameters that determine the step-growth polymerization into higher level worm-like multicompartment superstructures. Finally we want to demonstrate that some MCMs can be exploited as precursors for a novel synthetic path towards soft Janus particles.