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Nanostructured assemblies from amphiphilic ABC multiblock polymers¹

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Amphiphilic AB diblock copolymers containing a water compatible segment can self-assemble in aqueous media to give supramolecular structures that include simple spherical micelles and macromolecular vesicles termed polymersomes. Amphiphilic ABA triblocks with hydrophobic end blocks can adopt analogous structures but can also form gels at high polymer concentrations. The structural and chemical diversity demonstrated in block copolymer micelles and gels makes them attractive for applications ranging from drug delivery to personal care products to nanoreactors. The inclusion of a third block in amphiphilic ABC triblock systems can lead to a much wider array of self-assembled structures that depend not only on composition but also on block sequence, architecture and incompatibility considerations. I will present our recent efforts on tuning micelle and gel structure and behavior using controlled architecture ABC triblocks. The combination of diverse polymer segments into a single macromolecule is a powerful method for development of self-assembled structures with both new form and new function.

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