

## **202c Synthesis and Characterization of Amphiphilic Block Copolymers, Self-Assembly Behavior and Drug Delivery Applications**

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We have developed an amphiphilic multiblock copolymers, poly(N,N-(diethyl amino)ethyl methacrylate) – b - poly(ethylene oxide) – b - poly(propylene oxide)-b-poly(ethyleneoxide)-b-poly(N,N-(diethylamino)ethyl methacrylate) (PDEAEM-b-PEO-b-PPO-b-PDEAEM), that form micelles and gels with temperature and pH responsive properties. The PEO-PPO-PEO blocks are derived from the commercially available Pluronic® F127 triblock copolymers. The pentablock copolymer retains the thermoreversible gelation properties of the Pluronic® copolymer. The goal of this work is to investigate effects of concentration, temperature and pH on the self-assembly of the pentablock copolymer in solution at multiple length scales ranging from the nanoscale to the macroscale. Small angle neutron scattering techniques and cryogenic transmission electron microscopy were used to study the micelle and gel structures formed in aqueous pentablock copolymer solutions. Cell culture cytotoxicity experiments of the pentablock copolymer gel indicate good biocompatibility, indicating this material has great promise for future applications in drug delivery.