

### **81c Self-Assembly of Amphiphilic Linear Dendritic Block Copolymers for Drug Delivery**

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A novel amphiphilic ABA linear dendritic block copolymer has been created for targeted drug delivery. The novel polymer has a hydrophobic core composed of poly(propylene oxide) (PPO) and hydrophilic A blocks of polyamidoamine (PAMAM). The proposed architecture is flexible and tunable, where the middle hydrophobic block can be extended to increase capacity or the chemistry of the block can be modified or changed to change encapsulation properties. The outer dendritic blocks create dense regions of functional groups to which ligands can be attached for targeting purposes. This work outlines the synthesis of PAMAM-PPO-PAMAM and its characterization to establish the feasibility of a polymer with the described architecture as a drug delivery micelle. Solution phase properties of the amphiphilic polymer were determined. The results from studies to ascertain the critical micelle concentration in water using pyrene as a fluorescent probe show that aggregates form in solution at concentrations that are comparable to pluronic drug delivery systems. Dynamic light scattering and TEM were used to characterize the size and shape of the polymer micelles. Drug loading and release studies with a model hydrophobic drug, irgasan, were performed. Modifications of the amphiphilic block copolymer include the covalent addition of small poly(ethylene glycol) (PEG) chains to the PAMAM block. The solution phase properties of the PEG-modified polymer has been studied and will be presented.