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**Polypeptoids: A model system for exploring sequence and shape effects on block copolymer self-assembly**

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While our ability to understand the detailed relationship between block copolymer chemistry and mesoscopic self-assembly has made remarkable progress over the last many years, yet we are still limited to a relatively small number of blocks in terms of structure-property understanding. Thus, there is a need to explore self-assembly phase space with sequence using a model system. Polypeptoids are non-natural, sequence specific polymers that offer the opportunity to probe the effect of sequence on self-assembly with much simpler molecular interactions and more scalable synthesis than traditional polypeptides. In this talk, I will discuss the use of this model system to understand the role of sequence on chain collapse and globule formation in solution, polymer crystallization, and block copolymer self-assembly. I will then discuss potential application as surface active agents for anti-fouling.