

Electrospinning: A bridge between nanotechnologies and bioinspired applications

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A major goal of nanoscience and nanotechnology is to connect materials systems on different length scales to take advantage of the unique properties of nanoscale materials. Throughout the lecture, hierarchical scaling is demonstrated. It focuses on electrospinning technology and discusses the relative importance of various processing parameters in solution electrospinning. The combination of matter self-assembly and electrospinning enables new structures and constructs to benefit from both the molecular and nanostructural features of self-assembly and the macroscale design freedom of electrospinning fabrication. A fiber architecture-based model is presented to connect nanoscale materials' properties to macrostructures. The lecture demonstrates the bridging concept using proteins, polysaccharides, and polymers in various applications, including energy, the environment, and food.