

DNA-directed Formation of Inorganic Nanostructures

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Abstract

This award in the Inorganic, Bioinorganic and Organometallic Chemistry Program is part of the NSF 98-20 Nanotechnology initiative and supports research in the laboratories of Dr. Chad Mirkin at Northwestern University. The research involves the preparation of nanostructures consisting of DNA and/or nanoparticles, which may be insulators, semiconductors, or metals, utilizing the chemical and physical characteristics of DNA to control particle placement and interparticle distance in two and three-dimensional materials. The ultimate goal of this program is to control particle composition and colloidal crystallization in the preparation of functional materials based upon hybrid nanostructures. The investigators will develop a theoretical understanding of the optical, structural, and electrical properties of these new nanostructures. The proposed research is anticipated to allow the synthesis of nanostructures with predetermined physical and chemical properties. These materials may have applications in photocatalysis, nonlinear optics, separations, sensor design, and photonics.