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Templated Organization of Nanoparticles using Self-Assembling Peptides NIKHIL SHARMA, JOEL SCHNEIDER, KRISTI KIICK, University of Delaware, DARRIN POCHAN, Unviersity of Delaware — Bottom up nanofabrication holds the potential for engineering matter at scales that are limit of current lithographic capability. Herein we describe the template-directed organization of inorganic nanoparticles into linear arrays using two distinct, hierarchically assembled peptide nanostructures. First, a long chain alanine-rich polypeptide was also used to create 1D nanoparticle assemblies. This peptide assembles into fibrils with monodisperse widths and presents charged functional groups in a desired periodic fashion along the length of the fibril. These functional groups bind nanoparticles that results in their spatially modulated linear arrangement. Second, a 20 amino acid peptide, consisting of alternating lysine and valine residues flanking a central diproline turn sequence (VKVKVKVKVPPTKVKVKVKV-NH2) was employed as a template for the organization of 2nm gold particles. This peptide self assembles into a laminated morphology in solution and has a periodic nanostructure. Negatively charged nanoparticles are templated into the positively charged lysine layer and are aligned within the laminated template to form laterally spaced (2D) linear arrays.

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