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Manipulating nanoparticles via polymer crystallization CHRISTOPHER LI, BIN DONG, BING LI, XI CHEN, WENDA WANG, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA 19104, USA — Directed nanoparticle (NP) assembly is of great interest in order to achieve desired NP structures for various application purposes. In this presentation, we will present our recent results on employing polymer single crystals (PSC) to direct NP assembly. First, tailor-made, free-standing NP frames and wires containing single or multiple types of NPs have been obtained by using an in-situ polymer crystallization method. End functionalized poly(ethylene oxide) single crystals were used as the templates. Gold and magnetite NPs were successfully patterned as evidenced by transmission electron microscopy experiments. Secondly, carbon nanotube induced PSCs were used to guide AuNPs to assemble into periodic pattern with controlled periodicity. Thirdly, polymer nanofibers decorated with block copolymer single crystals were used as templates to induce the formation of hydroxyapatite (HA) nanocrystals and the resultant nanofiber/HA hybrids mimic the structure of natural bones.

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