Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Creating Ordered Antibody Arrays with Antibody-Polymer Conjugates. XUEHUI DONG, ALLIE OBERMEYER, BRADLEY OLSEN, Massachusetts Institute of Technology — Antibodies are a category of functional proteins that play crucial roles in the immune system and have been widely applied in the area of cancer therapeutics, targeting delivery, signal detection, and sensors. Due to the extremely large size and lack of specific functional groups on the surface, it is challenging to functionalize antibodies and manipulate the ordered packing of antibodies in an array with high density and proper orientation, which is critical to achieve outstanding performance in materials. In this work, we demonstrate an efficient and facile approach for preparing antibody-polymer conjugates with two-step sequential "click" reaction to form antibody-polymer block copolymers. Highly ordered nanostructures are fabricated based on the principles of block copolymer self-assembly. The nanostructures are studied with both small angle X-ray scattering (SAXS) and transmission electron microscopy (TEM). Lamellae with alternating antibody domain and polymer domain are observed with an overall domain size of ~50 nm. The nanostructure not only increases the packing density and promotes proper orientation of the antibody, but also provides possible channel to facilitate substrate transportation and improves the stability of the antibody.

Xuehui Dong
Massachusetts Institute of Technology

Date submitted: 24 Nov 2015 Electronic form version 1.4