

Abstract Submitted
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Label-free optical detection of protein binding on small-molecule ligand microarrays¹ Y. S. SUN, J. P. LANDRY, X. D. ZHU, Dept. of Physics, Univ. of California at Davis, T. BAO, K. S. LAM, Dept. of Internal Medicine, Univ. of California at Davis Medical Center — Biomolecular microarrays are becoming indispensable tools in proteomic research and biomarker discovery processes. The need for label-free microarray detection methods that are complementary to fluorescence-based methods is also increasing. We have developed oblique-incidence reflectivity difference (OI-RD) microscopes for detecting protein-protein and protein-small molecule reactions in microarray format through changes in density, thickness, and conformation of surface-bound proteins on solid supports. This can be done without extrinsic labeling molecules (e.g. organic fluorophores or quantum dots), which are costly and potentially intrusive. Of particular interest to one of our current investigations are microarrays of small molecules that may be used for high-throughput screening for protein ligands. With OI-RD microscopes, we have detected antibody-antigen capture and streptavidin-biotin binding reactions in microarray format using mixtures of proteins as well as pure proteins in prescribed sequences. In the streptavidin-biotin binding reaction, we used BSA molecules as the scaffold to anchor biotin molecules on the solid support. We will report these recent experimental results and the analysis.

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