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Real-time High Resolution Plasmonic nanosensors: pH modulated captavidin/biotin binding[1] JEFFREY ANKER, RICHARD VAN DUYNE, Northwestern University — The ability to observe real-time molecular binding kinetics is important for understanding the functions and interactions of biological molecules. Localized surface plasmon resonance (LSPR) nanosensors exhibit intense extinction and scattering spectra that redshift when molecules bind to their surface. Herein, we use an array of biotin functionalized silver nanoprisms to detect pH-modulated binding and dissociation of captavidin to biotin as a model system. The captavidin binds at neutral pH and dissociates at high pH. Spectral shifts are monitored in real-time at high resolution during pH-modulated binding and dissociation cycles over hours. After the first cycle, good reversibility is observed. We also observe pH modulated charging and nanoparticle etching effects which are important experimental parameters and also provide a means to control and modulate the nanoparticle spectra.

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