

## **Active Control of Energy Transfer in Plasmonic Nanorod-Polyaniline Hybrids**

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I will discuss recent work in which we showed that polyaniline (PANI), which readily hybridizes onto gold nanorods (AuNRs), undergoes switchable energy transfer when the PANI chemical structure is modulated between its emeraldine base and salt forms. Energy transfer between plasmonic nanoparticles and polymer acceptors is a possible means to overcome fast competing processes such as rethermalization. Energy transfer had not previously been identified, despite the fact that AuNR/PANI hybrids have been widely studied for refractive index switching. Because energy transfer depends strongly on spectral overlap between the donor (AuNR plasmon) and the acceptor (PANI absorption) spectra, small changes in overlap within a heterogeneously broadened colloidal sample are enough to obscure the effect in ensemble spectroscopy. Single-particle scattering studies exploit the innate heterogeneity of AuNR/PANI samples because we were able to examine the spectral overlap of 1 hybrid at a time and show that strong energy transfer can occur when overlap is maximized in either the emeraldine base or salt forms. Thus, the small differences in AuNR/PANI structure turn out to be an advantage when we look one hybrid at a time.