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**Surface plasmon resonance reflects diameter of actin structures decorated with gold nanorods** JOEL SOLOMON, Department of Physics and Optical Science, Center for Biomedical Engineering and Science, University of North Carolina at Charlotte, TEJAS PRUTHI, AARON BRETTIN, VASILY ASTRATOV, Department of Physics and Optical Science, University of North Carolina at Charlotte, YURI NESMELOV, Department of Physics and Optical Science, Center for Biomedical Engineering and Science, University of North Carolina at Charlotte
— We used actin filaments (diameter 6 nm [1]) and bundles (diameter 140 nm [1]), decorated with gold nanorods (AuNR, diameter 10 nm), to examine if the spectral position of surface plasmon resonance (SPR) follows diameter change of these biological objects. SPR is sensitive to the dielectric properties of the environment of the AuNR. Since the diameter of an actin filament is comparable to the diameter of a AuNR and the diameter of a bundle is much larger, the environment of a bound AuNR is different which should modulate the spectral position of the SPR. We found that the spectral position of the transverse SPR remained virtually the same for decorated filaments and bundles. The position of the longitudinal SPR was red shifted by 20 nm with the increase of the diameter of the biological object. We conclude that the spectral position of the longitudinal SPR reflects the difference in diameters of actin filaments and actin bundles upon decorating them with AuNR.
[1] S. Jansen, A. Collins, C. Yang, G. Rebowski, T. Svitkina, and R. Dominguez. Mechanism of actin filament bundling by fascin. *Journal of Biological Chemistry*, 286(34):30087-30096, 2011.

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