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Selective plasmon enhancement of fluorescence towards point of care disease diagnostics BISHWAMBHAR SENGUPTA, JINGYI ZHU, Clemson University, RAMAKRISHNA PODILA, APPARAO RAO, Clemson Univeristy — Surface plasmon coupled emission (SPCE) is a novel analytical technique in which the isotropic emission of a fluorophore is combined with the surface plasmon resonance of a metal thin film to yield highly directional emission from the so-called plasmaphore and thus greatly increased sensitivity. The optimal SPCE enhancement is achieved by introducing a spacer layer to mitigate fluorescence-quenching arising from metal-fluorophore interactions. Here we report a >10-fold amplification of rhodamine B (RhB) fluorophore when carbon nanomaterials are used as the spacer layer. By combining experimental and density functional theory studies, we found that the rehybridization between CNMs and RhB results in emission redshift. We present SPCE-based biosensors for smart-phone based sensing of different analytes including biomarkers for diseases such as tuberculosis.

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