

## **Molecular plasmonics with tunable exciton-plasmon coupling strength in J-aggregate hybridized Au nanorod assemblies**

Controlling coherent electromagnetic interactions in molecular systems is a problem of both fundamental interest and important applicative potential in the development of photonic and opto-electronic devices. The strength of these interactions determines both the absorption and emission properties of molecules coupled to nanostructures, effectively governing the optical properties of such a composite metamaterial. Here we report on the observation of strong coupling between a plasmon supported by an assembly of oriented gold nanorods (ANR) and a molecular exciton. We show that the coupling is easily engineered and is deterministic as both spatial and spectral overlap between the plasmonic structure and molecular aggregates are controlled. We think that these results in conjunction with the flexible geometry of the ANR are of potential significance to the development of plasmonic molecular devices.