# New Advances in Hybrid Plasmonic Nanoparticles for Biomedical Applications

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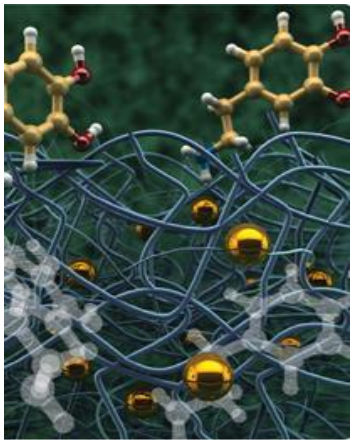
In this talk, we present the design of hybrid plasmonic nanostructures, combining gold nanoparticles and functional polymers (smart, reactive and molecularly imprinted polymers) for applications in biosensors and nanomedecine. We will first describe an original strategy for the regioselective functionalization of gold nanoparticles, based on a combination of photo-induced plasmon excitation and aryl diazonium salt chemistry [1-3]. This strategy allows the grafting of the chemoreceptors in specific areas of maximum near field enhancement, resulting in highly sensitive biosensing platforms for the detection of biomarkers by Surface-Enhanced Raman Spectroscopy. The grafting of molecularly imprinted polymer shells is also shown to provide optical nanosensors enabling the direct, label-free detection of various kinds of molecules, such as folic acid and paracetamol [4]. The combination of plasmonic nanostructures and polymers therefore offers promising outlook to merge multiple functions at the nanometer scale, which is of particular interest for biomedecine.

**Figure 1.** Illustration of hybrid plasmonic nanostructures combining gold nanoparticles and functional polymers



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