Graphene-coated plasmonic interfaces have been theoretically and experimentally investigated as alternative SPR surfaces. The advantages of graphene-based SPR surfaces are the high surface-to-volume ratio which has proven to be beneficial for efficient adsorption of biomolecules when compared to gold and possible -stacking interactions between the carbon-based ring structures of organic and biological molecules and the hexagonal cells of graphene. This strong interaction of biomolecules is, however, a major limitation of graphene-based SPR sensors due to the lack of specificity of these interfaces.

In this presentation, different strategies (electrophoretic deposition, mechanical transfer, etc) for the formation of graphene-coated SPR interfaces will be presented and their respective advantages/disadvantages discussed [1,2]. The resulting SPR surfaces were used for the detection of lysozyme, an enzyme that hydrolyses the polysaccharide walls of bacteria. Increased concentrations of lysozyme in urine and serum are associated with leukemia and renal diseases. The exact determination of lysozyme concentrations is thus of clinically importance. It will be further shown that such SPR interfaces are alternative platforms for the screening of pathogens and for the understanding of bacterial adhesion parameters.