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Abstract

The periodic follow-up of pharmacologic treatment features as one of the expansion fields of biosensor technologies in view of their key influence in the efficiency of the treatment and the possibility to prevent secondary effects of the drug. In the present project we aim at fabricating a platform for the detection of Clioquinol, a cancer treatment drug that will be used as a model molecule. [1]

The work is divided into three fundamental pillars. First, the achievement of a sensitive, stable, and highly reproducible plasmon detection system. For this purpose, a tool capable of sensing individual plasmons in nanostructured plasmonic materials was developed. The system is able to detect spectral displacement due to the presence of biological molecules as well as serving as a quality control tool. [2]

Then the fabrication of a plasmonic support that could be used as a drug tracking cartridge, that should be biocompatible and reusable, as it can be used both in transmission/reflection spectroscopy and in Surface enhance Raman Scattering (*SERS*). The present project proposes the insilico design and fabrication of gold nanocrown structures onto silicone nanopillars (*AuNCr/SL*), exhibiting promising simulated localized surface plasmons.

Last but not least, the biofunctionalization pathways of the surface of said structures through titanosinalization processes will be described and their effectiveness will be proved in X-ray spectroscopy (*XPS*) experiments.

[1]. Wagner, C.C. et al. Vibrational spectra of clioquinol and its Cu(II) complex. J. Raman Spectroscopy 38 (2007) 373.
[2]. Ming Li, et al. Plasmon-Enhanced Optical Sensors, Analyst. 2015 Jan 21; 140(2): 386–406.