Nanostructured porous silicon (nPSi) can be regarded as a complex network of silicon nanocrystals embedded in an amorphous porous matrix. Its typical large specific surface area and high reactivity make this material very suitable for the development of sensors. Moreover, its biocompatibility and biodegradability opens the way to the development of biosensors and biomedical applications. In addition, its porous structure and compatibility with electrochemical, physics and chemical techniques to develop hybrid nanomaterials become nPSi as excellent candidate for use as composites host material. On the other hand, noble metal nanoparticles (NPs) including Au and Ag have also become an emerging tool for biosensing, due to their localized surface plasmon resonance properties can enhance both Raman and Fluorescence signals different biomolecules linked around, being possible to use such spectroscopic techniques as high sensitivity detection routes for biosensing. In the present work, hybrid Ag/porous silicon thin films were fabricated by the capillarity suction of AgNPs inside nPSi porous structure. AgNPs were green biosynthetized Peumo extract which is a simple, fast, eco-friendly and efficient process. The main properties of the final hybrid thin film have been characterized by different experimental techniques including SEM, XPS, AFM, FTIR, and XRD. After expose these substrate to different concentration of fluorescence biomolecules such as rhodamine B and emodin, experimental results have shown an enhance of fluorescence signal in comparison with the control, opening the way for the development of efficient high sensitivity biosensors.

Keywords: Porous silicon, Silver nanoparticles, Biosensing

Acknowledgment:

The author of this work gratefully thank FONDECYT proyect 11150322 for financial support

Presenting author’s email: grecio@uct.cl