

# Nanoplasmonics and surface enhanced spectroscopy

## Plasmonic nanochips for applications in enhanced fluorescence spectroscopy

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The utilization of plasmonic nanochips (PN) in fluorescence measurements becomes more reachable now because of new possibilities, opened by nanotechnology [1]. Among of PN advantages in comparison with traditional methods are minimization of necessary reagents, possibility to perform the fluorescence measurements in real time flow regime and, as main point, more simple realization of fluorescence enhancement, using phenomenon of localized surface plasmon resonance (LSPR). There two main problems, which should be overcome to prepare the appropriate plasmonic nanochips – ordering of nanostructures arrays and providing of the precise dielectric covering to prevent the quenching and respectively, to reach the enhancement of fluorescence signal [2]. In this work we present the attempts to realize the preparation of PN with reasonable characteristic to observe the surface enhanced fluorescence (SEF). Here we used the several technology approaches to prepare the PN, including thermal annealing of island high conductive films, nanoimprint lithography and laser interferometry. To optimize the distance between dye and nanostructure the finite domain modeling was used. The precise thickness of dielectric covering, which realize this distance, was provided, using LbL and SiO<sub>2</sub> layers.

1. *V.I. Chegel. Nanostructured materials for biosensor application. Comparative review of preparation methods. In book: RSC Nanoscience and Nanotechnology No. 24. Published by Royal Society of Chemistry. 2012. – pp. 318-357.*
2. *Demchenko A.P. Introduction to fluorescence sensing // Springer. – 2009. – 590 p.*