

Title:

Label-free biosensing for dry eye by means of BICELLS

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

The use of Biophotonic Sensing Cells (BICELLS) based on micro-nano patterned photonic architectures has been recently proven as an efficient methodology for label-free biosensing by using Optical Interrogation [1]. According to this, we have studied the different optical response for a specific typology of BICELL, consisting of structures of SU-8. This material is biocompatible with different types of biomolecules and can be immobilized on its sensing surface. In particular, we have measured the optical response for a biomarker in clinic diagnostic of dry eye. Although different proteins can be studied such as: PRDX5, ANXA1, ANXA11, CST4, PLAA y S100A6 related with ocular surface (dry eye), for this work PLAA (phospholipase A2) is studied by means of label free biosensing based on BICELLS for analyzing the performance and specificity according with means values of concentration in ROC curves.

References:

[1] M. Holgado, C.A. Barrios, F.J. Ortega, F.J. Sanza, R. Casquel, M.F. Laguna, J. Bañuls, D. Lopez-Romero, R. Puchades, A. Maquieira. *Label-free biosensing by means of periodic lattices of high aspect-ratio SU-8 nanopillars*. Biosens. Bioelectron. , 25 (2010), pp. 2553–2558

[2] F.J. Sanza, M. Holgado, F.J. Ortega, R. Casquel, D. López-Romero, J. Bañuls, M.F. Laguna, C.A. Barrios, R. Puchades, A. Maquieira. *Bio-photonic sensing cells over transparent substrates for antigestrinone antibodies biosensing*. Biosens. Bioelectron., 26 (2011), pp. 4842–4847

[3] A. Lavin, R. Casquel, F.J. Sanza, M. F. Laguna, M. Holgado. *Efficient design and optimization of bio-photonic sensing cells (BICELL's) for label free biosensing*. Sens. Actuators B: Chem. (2012)