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Biophotonic Sensing Cells for measuring biological agents

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Abstract

Label-free immunoassay sector is a ferment of activity, experiencing rapid growth as new technologies come forward and achieve acceptance. The challenges can be broken down into several key aspects as: sensibility and competitive limit of detection, ability of measuring molecules with different molecular mass, low reagent consumptions and the capability of measuring with simple drops for measuring different molecules simultaneously. The landscape is changing in a “bottom up” approach, as individual companies and research groups promoting key remarkable technologies. However, no many technologies based on Label-free technology are currently in the market, where mature labeled technologies such as lateral flow for its simplicity and ELISA for its sensitivity as ones of the most employed nowadays. Biophotonic Sensing Cells (BICELLs) defined as Bio-Sensitive cells that can be integrated in wells and interrogated vertically by enhanced optical techniques is currently an interesting approach for measuring biological agents as an label-free alternative for its capability of multiplexing many sensing sites in a single well, and therefore multiples diagnostics can be implemented simultaneously. Furthermore, good figures of sensitivity have been demonstrated for measuring different biological agents such as proteins, hormones and viruses, even in real samples. Several BICELLs type have been proposed and published. A good example it is that based on network of nanopillars made of low-cost resist, where bioreceptors can be immobilized easily. BICELLs technology is an interesting technology to face the unmet need for reliable diagnostic tools that ensure sensitive, rapid and simple analysis through a simple PoC reader.

Biography

Dr. Eng. Miguel Holgado received Ingeniero Industrial degree (1996) from Universidad Politécnica de Madrid (UPM), and Doctor Ingeniero Industrial degree (Ph.D.) at the Spanish National Research Council from the same University (2000). He is currently Group Leader of the Micro-nano Photonics and Biohotonics at the UPM Laser Centre and Associate Professor at the Applied Physics Departement of ETSII (UPM). He has more than 4 years experience working in R&D in Industrial Sectors, was Spanish Representative in the 5th and 6th European R&D Framework Programme. He is author/co-author of multiple publications in international journals cited more than 800 times.

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