BILOBA
BLOCH ELECTROMAGNETIC SURFACE WAVE BIOSENSORS FOR EARLY CANCER DIAGNOSIS

07TH APRIL 2014

BILOBA project is over midway towards completion

The collaborative project BILOBA "**Bloch electromagnetic surface wave biosensors for early cancer diagnosis"** funded by the European Commission through its Seventh Framework Programme, reaches half of its development.

Overview of BILOBA

BILOBA aims at developing a **compact** and **multifunctional** point-of-care platform leading to a **rapid detection of cancer biomarkers** at very low concentration, that can be monitored real-time. This will be achieved by exploiting the unique features of electromagnetic waves bound at the biochemically active surface of a disposable photonic crystal biochip upon capturing the relevant biomarkers from plasma samples. The platform operates in a tandem configuration using label-free detection and spectral analysis of enhanced fluorescence emitted by immobilized biomolecules.

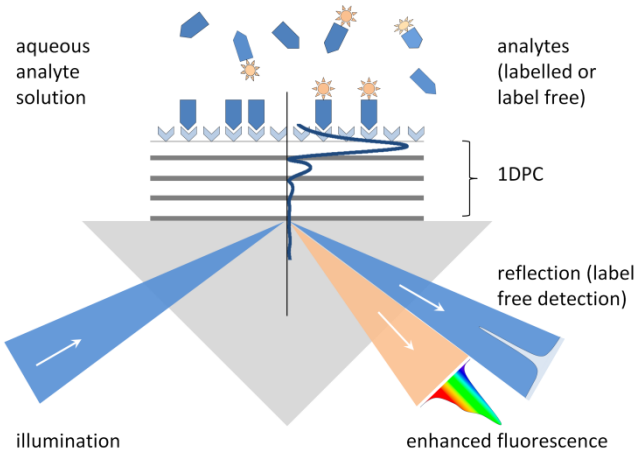

Figure 1: BILOBA technical solution

Concept

The well-established optical method for label-free detection of biomolecules is the surface plasmon resonance (SPR). However, its sensitivity suffers from the strong absorption of surface bound waves. Here, a similar concept, already at the proof of principle stage, is advantageously implemented by applying the unique properties of Bloch Surface Waves (BSW) sustained on 1D Photonic Crystal (1DPC). By analysing both labeled and label-free signals on the same bio-sensor, the system can increase the resolution and reliability of optically read surface bound assays.

The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013), under the Grant Agreement n° **318035.**

Results achieved

The integration on a single platform of the simultaneous detection of the label-free and fluorescence signals has been already demonstrated at the present stage of development. Plastic BSW bio-chips are designed, fabricated and tested on the platform. The routes to chemical functionalization of the bio-chips surface have been developed and tested. In the second half the full prototype will be developed and BSW bio-chips will be tested in a pre-clinical environment to confirm their response in the presence of cancer bio-markers.

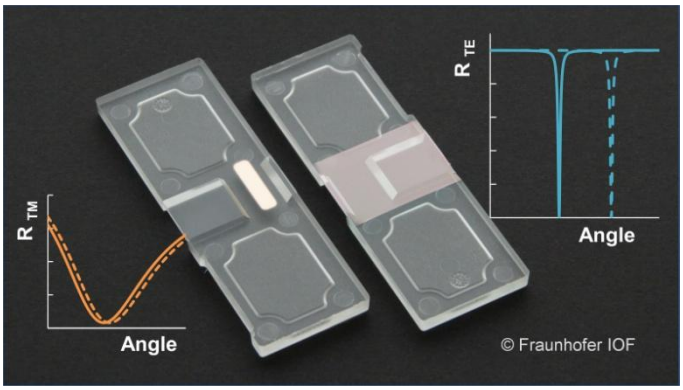

Figure 2: plastic BSW bio-chips

BILOBA will be present at the following events:

- ✓ ***SPIE Photonics Europe Conference*** (Brussels, Apr 13-17 2014)
- ✓ ***Europt(R)ode*** (Athens, Apr 13-17 2014)
- ✓ ***PEG Summit*** (Boston, May 5-9 2014)
- ✓ ***PEG Summit Europe*** (Lisbon, November 3-7 2014)

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