Claire Soum et al., J Biosens Bioelectron 2014, 5:3
http://dx.doi.org/10.4172/2155-6210.S1.022

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Biosensors & Bioelectronics
August 11-13, 2014 Hilton San Antonio Airport, San Antonio, USA

Design, characterization and evaluation of reusable biosensors allowing the direct monitoring of MMP activities

Claire Soum[1,2], **Mohamed-Anis Alouini**[1], **Sandra Albenque-Rubio**[1], **Jean Guillon**[1], **Gérard Déléris**[1] and **Thomas Berthelot**[1]
[1]University Bordeaux, France
[2]IRAMIS, France

Matrix metalloproteinases (MMP) are a family of proteolytic enzymes, the expression of which in a key step of tumor progression has recently been better defined. The over-expression of one or more MMPs is thus common among malignant tumors. It may characterize tumor progression and help predicting its response to chemotherapy. Consequently, the development of a device for measuring MMP activities is an important challenge for diagnosis and prognosis. Herein, we describe an innovative supported biosensor for screening MMP activities. The array formation is based on stable supramolecular assembly between synthetic linear peptides (selective substrates of MMPs) and β-cyclodextrin surface as a "molecular printboard". The surface chemistry used here for the array development is based on an innovative chemistry named GraftFast™ which allows surface functionalization of conductive and insulating materials in water. Moreover, the surface chemistry versatility used for the β-CDs support synthesis allows transferring our system to a large variety of transducer systems as SPR (Surface Plasmon Resonance), QCM (Quartz Crystal Balance) or SAW (Surface Acoustic Wave) devices for example. To validate our supramolecular assembly, NMR and fluorescence studies have been performed and demonstrated the specific orientation of the linear peptides relative to the surface. The resulting sensor was used to discriminate *in vitro* MMP activities but also to distinguish between invasive and non-invasive cancerous cell suspensions in biopsy condition. Furthermore, surface sensor regeneration during *in vitro* and *ex vivo* experiments was performed and validated.

Biography

Claire Soum is a PhD student from Ecole Doctorale des Sciences Chimiques de Bordeaux since 2011. She will complete her PhD by the end of November 2014. She has won an award for the best poster presentation at the Chemical Sciences Doctoral School Day in 2013.

claire.soum@cea.fr