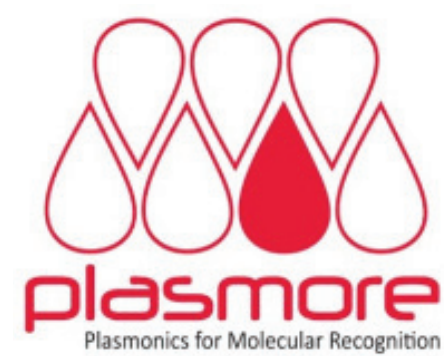


# Optical imaging biosensors for multiplex detection of food and feed contaminants

Willem Haasnoot<sup>1</sup>, Ana Frangolho<sup>2</sup> and Gerardo Marchesini<sup>2</sup>



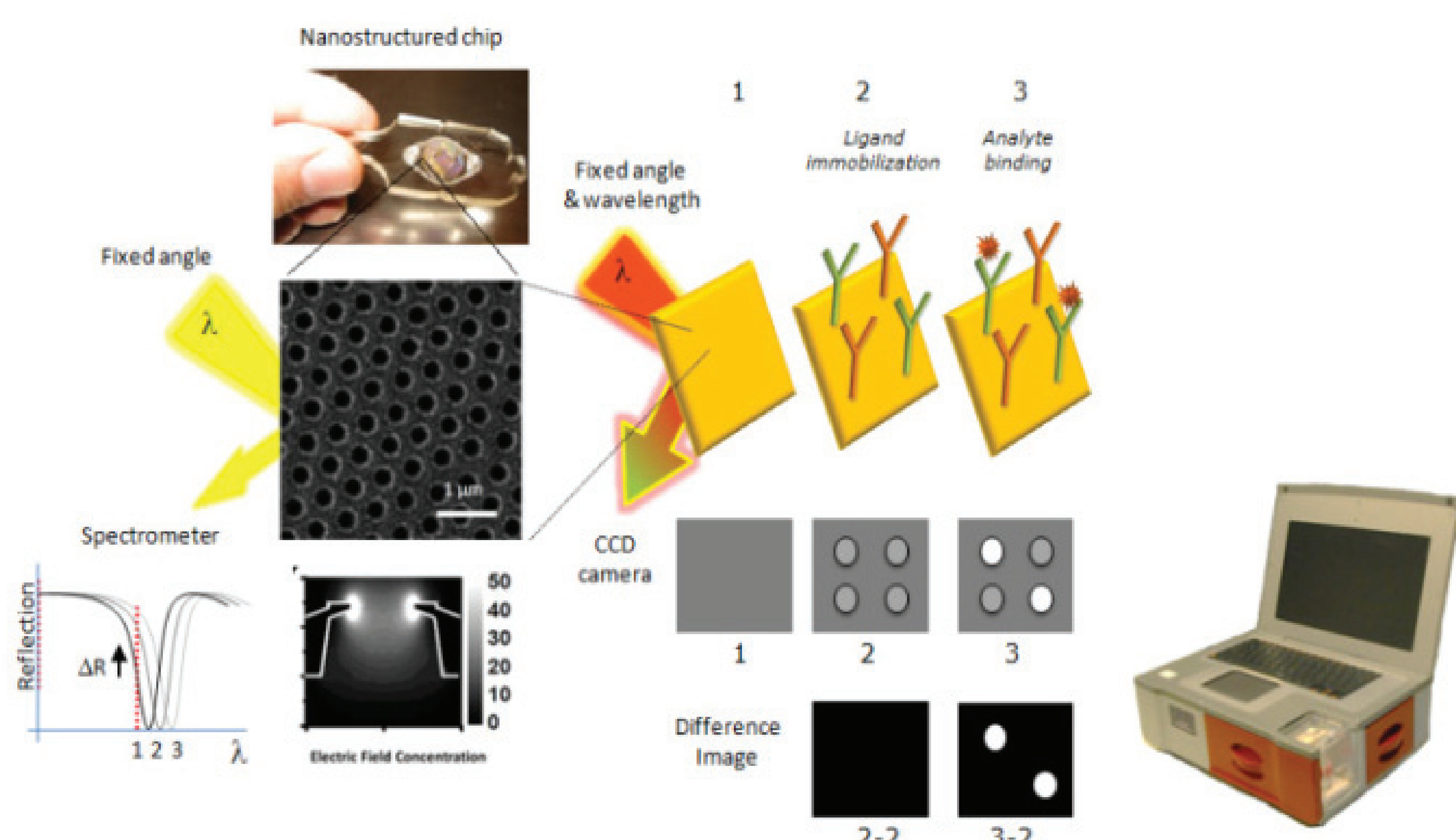
## Introduction

The growing need for new multi-analyte screening assays enables the development of platforms for the rapid and simultaneous detection of different contaminants in numerous samples. For that purpose, a new portable imaging SPR (iSPR) biosensor (the IMPRESSOR), in combination with a continuous flow microspotter, was tested as possible replacer of the bench top iSPR (IBIS, Figure 1) and compared with Biacore 3000 results within the Marie Curie project IMPROVED food safety monitoring through Enhanced imaging nanoplasmonics (IMPRESS, Project No. 286262). The multiplex approach was tested for the simultaneous detection of a milk protein, an antibiotic and a mycotoxin.



**Figure 1.** On the left the continuous flow microspotter, on the right the iSPR of IBIS with the IMPRESSOR on top.

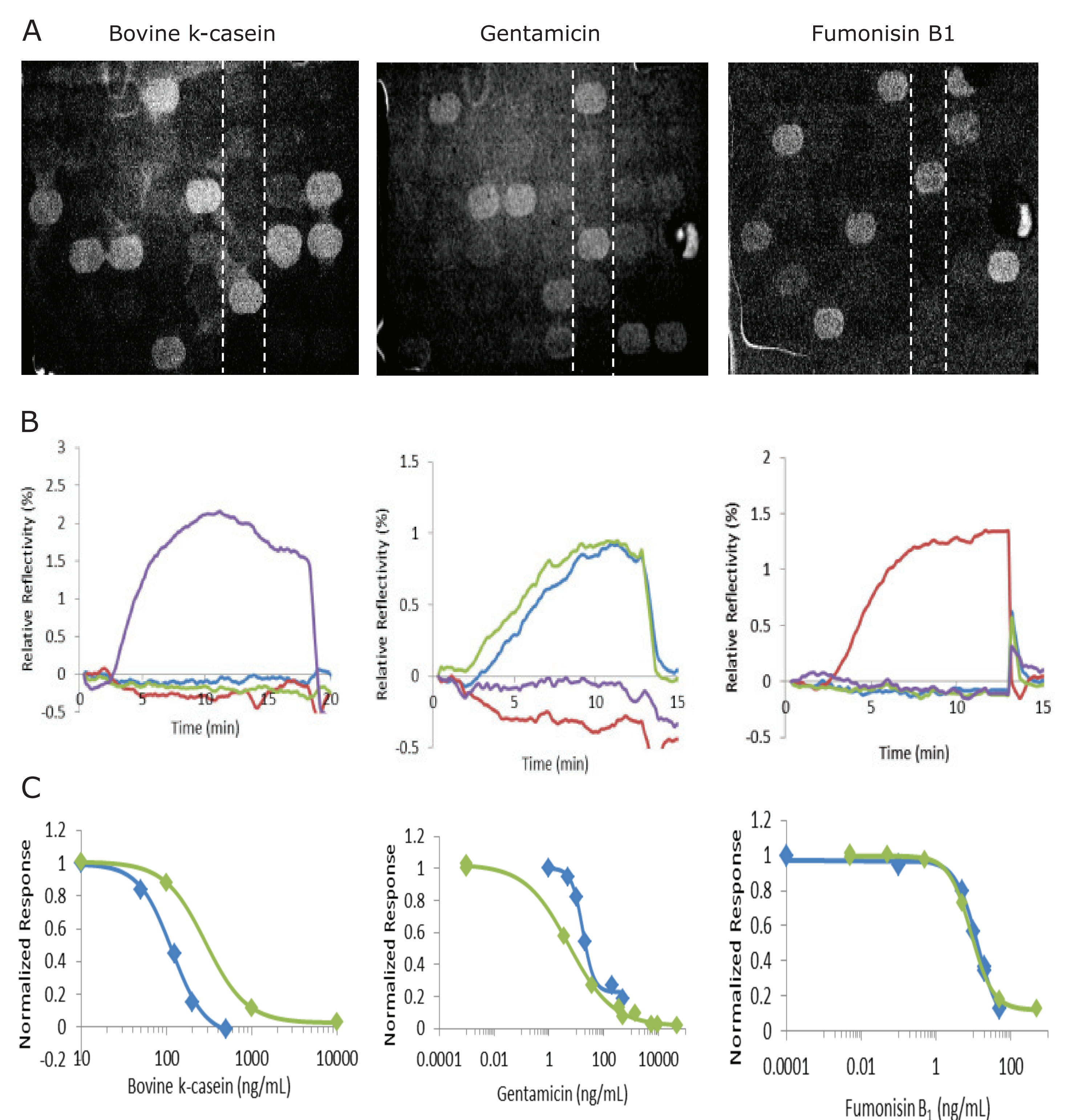
## Principle of the IMPRESSOR



**Figure 2.** Schematic presentation of the working of the IMPRESSOR based on Imaging Nanoplasmonics™.

## Results

After the interaction of 8, 5 and 6  $\mu\text{g/ml}$  of anti-casein, anti-gentamicin and anti-fumonisin, respectively, specific bindings of antibodies to the corresponding immobilized antigens are obtained (Figure 3A and 3B).



**Figure 3.** A) Multiple spots of the 3 antigens and the selected spots for analyses, B) Binding of antibodies to immobilized antigens and C) Inhibition curves in the IMPRESSOR (blue) and in the Biacore (green) using a mixture of 3 Mabs against k-casein with the anti-fumonisin and anti-gentamicin.

## Conclusions

The initial results obtained with the IMPRESSOR are close to those obtained with the Biacore and they look promising for further extension of the multiplex assay to more food and feed contaminants.

## Acknowledgements

This research was funded by the Marie Curie Actions- Industry-Academia Partnerships and Pathways and by the Dutch Ministry of Economic Affairs.

