

1- Introduction

Ochratoxin A (OTA) is the most common mycotoxin contaminating feed and foodstuffs, it has a chronic toxic effect and proved to be mutagenic, nephrotoxic, teratogenic, immunosuppressive and carcinogenic (1).

On the other side, because of their high stability, specificity, affinity and their easy chemical synthesis, Aptamer based methods (2) are applied to OTA bio sensing as alternative to traditional analytical technique.

This research project develops a label free aptasensor for Ochratoxin A detection based on the Impedance Spectroscopy (IS) as transduction method. IS is a simple, high-



sensitivity, low-cost and rapid transduction principle to follow biosensing events that takes place at the surface of an electrode.

To achieve the main feature of this work, electrodes based on aluminum anodization. Then, the Aptamer immobilized by covalent bond reaction (EDC-NHS).



3- Immobilization techniques



• A self assembled monolayer of 11-mercaptoundecanoic acid was formed on the porous aluminum oxide.



- Their carboxyl groups were activated using N-hydroxysuccinimide (NHS) and N-(3-dimethylaminopropyl)-N-ethylcarbodiimide (EDC).
- DNA aptamer was coupled to the activated SAM via a 5'-amino linker.

4- Ochratoxin A calibration curve and Aptasensor specificity





0,0 0,7 1,4 2,1 2,8 3,5 4,2 4,9 Concentration OTA ng/mL Aptamer response to Ochratoxin A at accumulative concentrations

Due to the specific interaction on the Aptasensor surface, the electric measurement show that the impedance values increase with increasing OTA concentration in the range of 0.5–5ng/mL, corresponding approximately to 10-100µg/kg.

5- Conclusion

Our developed method is a useful and promising platform for Ochratoxin A detection applications. The use of IS technique does not require any labelled species for the transduction. This detection technique can be used for designing label-free protocols avoiding more expensive and time-consuming assays.



References

(1) van der Merwe, K.J., et al., Ochratoxin A, a toxic metabolite produced by Aspergillus ochraceus Wilh. Nature, 1965. 205(976): p. 1112-3.

(2) Cruz-Aguado, J.A. and G. Penner, Determination of ochratoxin a with a DNA aptamer. J Agric Food Chem, 2008. 56(22): p. 10456-61.









moez.elsaadani@cirad.f