**Rapid and sensitive tools for enhanced chemical safety of food**

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Recently, the European Parliament has called on Member States to strengthen their food safety control mechanisms, which has become a priority for the French government. Over the past few years, substantial progress has been made in microbiological safety, as advances in molecular biology have helped develop rapid, inexpensive, and sensitive methods that are now used by regulatory authorities to improve their control systems. However, on the chemical safety side, the technical and societal transition is lagging behind. The current system is mainly based on monitoring and inspection plans using high-performance reference methods able to detect toxic contaminants in traces level. Among these methods, chromatographic techniques as gas chromatography or HPLC have been shown to be suitable for the detection of toxins, but they need highly trained personnel and they require separation/preconcentration steps, thus limiting the frequency of analysis. Biosensors have been described for many years as good substitutive or complementary tools to conventional methods for the detection of food contaminants, due to their ability to provide real-time qualitative detection with minimum preparation.

In this work, we present two affinity-based sensors for the detection of meat contaminants:

* Firstly, an electrochemical immunosensor for rapid and sensitive detection of fluoroquinolone (FQ) antibiotics is described based on the competitive binding of an synthetized electrochemical probe derivate of difloxacin and free quinolone present in sample on immobilized anti-quinolones antibodies. The proposed immunosensor allowed FQ detection from 0.005 µg.mL-1 to 0.01 µg.mL-1 with a detection limit of 0.003 µg.mL-1. The efficiency of the sensor and the adequacy of the extraction process were finally validated by analyzing different meat samples.
* Secondly, we present the development of electrochemical aptasensors for polychlorinated biphenyls (PCBs) detection. This sensing platform is based on already described sequences, truncated using computer modeling in order to improve the sensitivities of aptamers. The truncated aptamers were validated using Aptamer-based Fluorescent Assay in view of their future integration in electrochemical sensors.

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