# Antibodies to measure residual levels of mycotoxin ochratoxin A in food

VNIVERSITAT DE VALÈNCIA

## Production of new bioconjugates and antibodies for the immunodetection of ochratoxin A

**Inventors:**
Antonio Abad Somovilla, Consuelo Agulló Blanes y Daniel López Puertollano (Universitat de València); Antonio Abad Fuentes and Josep Vicent Mercader Badia (Consejo Superior de Investigaciones Científicas).

**Background:** One of the most harmful and frequent mycotoxins in food is ochratoxin A. Its presence is a real problem for human health due to its toxicity, and it causes significant economic losses to various productive sectors. The main fungi producing ochratoxin A belongs to the genera *Penicillium* and *Aspergillus*, and the products with the highest incidence are cereals, wine, juices and coffee. The small concentrations at which this potent toxin is usually found commonly require the use of sophisticated chromatographic methods. These techniques require laborious and costly methodologies, which must be performed by highly qualified personnel in accredited laboratories and usually far from production areas. These limitations determine the suitability of these techniques for the analysis of a large number of samples and to obtain results in short term, two key aspects to ensure the safety of marketed foods, as well as for more exhaustive studies on exposure of consumers to these toxins through food.

**The invention:** Researchers from Universitat de València and Consejo Superior de Investigaciones Científicas have obtained the reagents (haptens, bioconjugates and antibodies) required for the **immunochemical determination of ochratoxin A** that allow its rapid determination with high sensitivity, selectivity and minimal sample preparation. The immunoassay determination implies a low cost and simple analytical method with great capacity of sampling, thus solving the limitations that show the conventional analytical techniques. These immunoreagents have shown their efficacy in both direct and indirect competitive ELISA to detect concentrations close to parts per trillion. These immunoreagents can be easily implemented in various analytical platforms, from the simplest, such as competitive ELISAs and immunochromatographic strips, to more complex, like chips or biosensors of different types, which allows us to simultaneously analyze a large number of samples in low-resource settings such as warehouses, cellars and even farmlands.

**Applications:** The main application of the technology is in agrofood, environmental and food safety analysis, as procedure for determination, both qualitatively and quantitatively, of ochratoxin A in food and environmental matrices.

**Advantages**: The most remarkable advantages provided by this technology are:

- The developed immunoreagents are capable of recognizing ochratoxin A with an affinity and selectivity not previously described
- Simpler determination than using instrumental analytical techniques
- Rapidity and ability to process high number of samples
- Less sample pretreatment compared with conventional methods
- Ability to carry out in situ analyses with immunotests
- Low cost determination