

## Analytica-2015 : Hapten synthesis and immunoassay development for fluopyram analysis in food samples - Eric Ceballos-Alcantarilla - Universitat de Valencia

**Eric Ceballos-Alcantarilla**

*Universitat de València, Spain*

Pesticides are widely employed in current agricultural practices for plant and crop protection. A new-generation pesticide recently developed by Bayer Crop Science is the fungicide fluopyram, which was approved in Europe in February 2014. Fluopyram is recommended for preventing different fungi pests in crops such as apples, peaches, cherries and grapes. However, given that pesticides are potentially toxic chemicals, their presence in food can become a threat for consumers. Therefore, availability of rapid, sensitive, and economic analytical tools is desirable. In the present study, we have developed a competitive Enzyme-Linked Immune-Sorbent Assay (ELISA) for fluopyram analysis in food samples. Two functionalized haptens of fluopyram with equivalent spacer arms located at opposite positions were prepared by total organic synthesis. Using those derivatives, several protein-hapten conjugates were obtained and a collection of rabbit polyclonal antibodies was generated. Antibodies were evaluated against fluopyram by competitive ELISA in two different formats. After optimization of assay conditions (pH and ionic strength) sensitivities in the low nano-molar range were achieved. Performance of the best immunoassay was assessed using fortified and blind juice samples, and results were compared with a reference chromatographic method previously developed by our group. To the best of our knowledge, this is the first reported immune-assay for fluopyram.

High-fondness and particular monoclonal antibodies have been created against the strobilurin fungicide trifloxystrobin. A battery of functionalized haptens has been orchestrated, and conjugate-covered protein connected immunosorbent examines following various techniques have been created. From one perspective, a two-advance conjugate-covered immunoassay was improved utilizing expanded or short brooding occasions, with cutoff points of discovery of 0.10 ng/mL for the all-encompassing measure and 0.17 ng/mL for the fast test. Then again, an immunoassay in the conjugate-covered configuration was streamlined after a system comprising of only one brooding advance. This one-advance test had a restriction of recognition of 0.21 ng/mL. These examines demonstrated location limits for trifloxystrobin in the low parts per billion territory, well underneath the

normal most extreme buildup limits for this pesticide in staples (50 microg/kg).

Monoclonal counter acting agent based procedures have become a helpful investigative innovation in the agro-food area. These days, buildups of the as of late enlisted fungicide fluopyram are progressively being found in quality control programs. In the current investigation, novel concoction subordinations of this pesticide were readied and explicit and high-partiality monoclonal antibodies to fluopyram were raised just because. In addition, immunoassays to fluopyram were created in two elective catalyst connected immunosorbent measure groups, utilizing homologous and heterologous examine conjugates, with cutoff points of discovery beneath  $0.05 \mu\text{g L}^{-1}$ . The enhanced immunoassays were applied to the examination of fluopyram in strengthened plums and grapes of four distinct assortments just as in-house arranged musts and wines. Recuperations were somewhere in the range of 76.3% and 109.6% and coefficients of variety were underneath 20%. Evaluation limits were well underneath the most extreme buildup limits. Immunoassay execution was factually approved with a reference chromatographic strategy utilizing tests from fluopyram-rewarded plum and grape cultivars.

### Biography

Eric Ceballos-Alcantarilla has a degree in Chemistry and a Master's degree in Organic Chemistry, both from Universitat de València (Spain). Currently, he is pursuing his PhD at the Department of Organic Chemistry from Universitat de València and the Institute of Agrochemistry and Food Technology from the Spanish National Research Council. He is a recipient of a Pre-doctoral Fellowship from the "Atracció de Talent, VLC-CAMPUS" program of Universitat de València.

Email:Eric.Ceballos@uv.es  
Eric.Ceballos.Alcantarilla@gmail.com