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Hapten synthesis and immunoassay development for fluopyram analysis in food samples

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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.

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.

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