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PESTIPLAT: Integrated Platform for Pesticides Detection

PROJECT DESCRIPTION

The platform for pesticides detection to be used in food security monitoring (fruits, vegetables, drinking water, milk etc.) and agriculture research laboratories will be a user friendly tool able to perform measurements in 10 minutes time, to diagnose the pesticide presence, to alert and to record data for monitoring and statistical purposes, addressing important issues within the food security.

The project's main objective consists in developing the platform for pesticides detection, including four identical modules each of them containing the following compounds: biosensor, temperature and pH sensors, microfluidic module, fluids delivery control, heating system, computer interface and data acquisition of the sensors network.

PESTIPLAT will focus first on development of an amperometric microbiosensor for direct detection of organophosphoric pesticides using miniaturized electrodes, fabricated by using standard microtechnology processes like thin film metal deposition, micro or nanolithography and clean room facilities. The chemistry of deposited enzymatic layer (concentration, enzymatic activity measuring, deposition protocol), the immobilization technique for AChE, the fabrication technique and the electrical characteristics of the enzymatic sensor will be studied and will be optimised. Nanowire polyaniline thin layer will be deposited on working electrode and used as substrate for acetylcholinesterase immobilization in order to increase the sensor sensitivity. The high surface/volume ratio of the polyaniline will lead to a better conduction and improve essentially the sensor sensitivity.

The second activity developed will be the microfluidic module hosting the biosensor, pH and temperature sensors. The microfluidic system allows the biochemistry reaction of all four modules, independently, leading at the biosensor activation, acetylcholinesterase reaction and inhibition, electrolyte removal and system washing and sample preparation. The fluids delivery will be provided, using a pumping system. The third activity will provide electrical connections, electronic modules, data processing and acquisition of the sensors network. Also, results will be disseminated and exploited, and the platform will be patented.

The main result of the project will be a fully automatic platform for organophosphate pesticides detection at the stage of a prototype.



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PARTNERS

Project coordinator: National Institute for Research and Development in Microtechnologies (IMT-Bucharest), **Romania**

Project partners: Romelgen SA, **Romania**
HSG-IMIT c/o IMTEK, **Germany**
Scienion AG Research and Development, **Germany**

PROJECT DURATION AND TOTAL PROJECT COST:

Duration: 01/11/2010 – 30/10/2013

Cost: 1,005,725 Euro

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