DEVELOPMENT OF POTENTIOMETRIC BIOSENSOR FOR DETECTION OF POTATO GLYCOALKALOIDS

Alexey P. Soldatkin\textsuperscript{1}, Valentyna N. Arkhyypova\textsuperscript{1}, Sergei V. Dzyadevych\textsuperscript{1}, Elena A. Nazarenko\textsuperscript{2}, Yaroslav I. Korpan\textsuperscript{2}, Anna V. El'iskaya\textsuperscript{1}, Claude Martelet\textsuperscript{3}, Nicole Jaffrezic-Renault\textsuperscript{3}

\textsuperscript{1} Laboratory of Biomolecular Electronics, Institute of Molecular Biology and Genetics, NAS of UKRAINE
\textsuperscript{2} Ukrainian Centre of Biosensors, UKRAINE
\textsuperscript{3} Ecole Centrale de Lyon, IFoS UMR 5621, FranceEcole Centrale de Lyon, IFoS UMR 5621, FRANCE
a_soldatkin@yahoo.com, Ya_korpan@yahoo.com Claude.Martelet@ec-lyon.fr

A potentiometric biosensor for detection of glycoalkaloids in potatoes has been developed using pH-sensitive field effect transistor as transducer and enzyme butyryl cholinesterase as a bioreognition element. By using this biosensor and enzyme inhibition effect, the total potato glycoalkaloids can be measured in the concentration range 0.2 – 100 mM. The responses of the developed biosensors were reproducible with a relative standard deviation about 1.5 % and 5 % for intra- and inter-sensor responses, respectively. Moreover, due to the reversibility of the enzyme inhibition, the same sensor chip with immobilised butyryl cholinesterase can be used several times (for at least 100 measurements) after a simple washing by a buffer solution and can be stored at 4°C for at least three months without any significant loss of the enzymatic activity. Furthermore, it has been shown, that biosensor approach can be used for studying the enzyme inhibition mechanisms.

Glycoalkaloide concentrations in different potato juice samples were determined by such biosensor, and a good correlation with the real content was revealed.

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