

γ -GLUTAMYL TRANSFERASE CHARACTERIZATION USING SCANNING ELECTROCHEMICAL MICROSCOPY

Vaineta Vainalavičiūtė^{1,2}, Agnė Boguševičė², Inga Morkvėnaitė-Vilkončienė³, Tomas Mockaitis^{1,2}

¹Vilnius TECH, Department of Chemistry and Bioengineering, Vilnius 10223, Lithuania

²State Research Institute Centre for Physical Sciences and Technology, Department of Nanotechnology, Vilnius 10257, Lithuania

³Department of Electrical Engineering, Vilnius TECH, Vilnius 10223, Lithuania
vaineta.vainalaviciute@stud.vilniustech.lt

γ -Glutamyltransferase (GGT) is the main enzyme involved in glutathione (GSH) metabolism. This enzyme catalyzes the transfer of the γ -glutamyl group between glutathione and amino acids or peptides, maintains cellular redox balance, and protects cells from oxidative stress [1]. GGT activity is related to the functional state of the liver, biliary tract, and pancreas, therefore changes in the concentration of this enzyme in the blood can help assess disorders of various organs [2]. Currently, in clinical practice, GGT activity is determined by spectrophotometric, colorimetric, and other methods, which are sensitive but not very specific.

Scanning electrochemical microscopy (SECM) is a high-resolution microscopy technique that allows the visualization of local electrochemical activity on various surfaces (**Fig. 1**). SECM measurements are performed with an ultramicroelectrode that is capable of scanning at a distance to the sample surface, where catalytic, redox, or other electrochemically active sites may be present [3]. The use of scanning electrochemical microscopy (SECM) in this study allows for the investigation of local electrochemical processes, determination of GGT activity, and real time reaction kinetics.

The aim of this study is to analyse the electrochemical response of γ -glutamyltransferase using scanning electrochemical microscopy to develop sensitive biosensors for faster diagnosis of GGT related diseases.

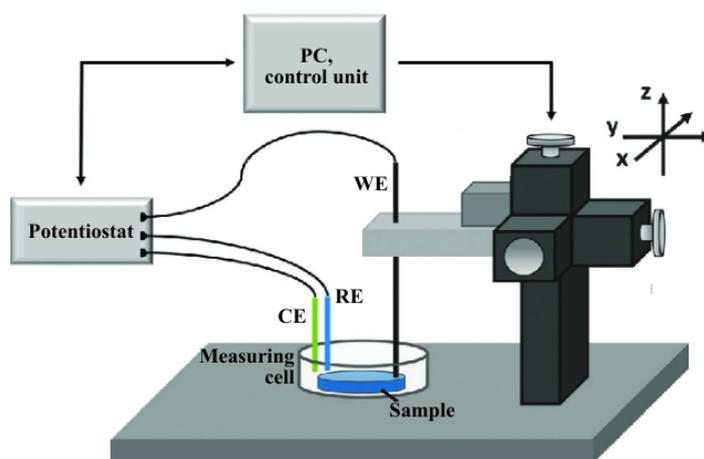


Fig. 1. Illustration of scanning electrochemical microscopy [4].

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