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SCANNING ELECTROCHEMICAL IMPEDANCE MICROSCOPY FOR THE EVALUATION OF BIOLOGICAL SURFACES

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Scanning electrochemical microscopy (SECM) is a powerful tool for the evaluation of reaction kinetics, occurred at the surface of interest [1]. Using SECM, it is possible to determine the surface's electrochemical activity by scanning it with ultramicroelectrode (UME) in a standard electrochemical cell. By using bipotentiostat, the surface of interest can be connected to the electrochemical cell. Potentiostat, used in SECM allows to apply available electrochemical techniques, such as amperometry, cyclic voltammetry, potentiometry, electrochemical impedance spectroscopy (EIS) and so on. If EIS is applied with SECM, the electrochemical system is called 'scanning electrochemical impedance microscopy' (SEIM). SEIM could be used for the registration of electrochemical impedance spectroscopy locally at the surface of interest [2,3]. This technique is beneficial in corrosion researches, but also can be applied for the evaluation of biological surfaces (Fig. 1). The application of SEIM for the assessment of biological surfaces is the main goal of our research.

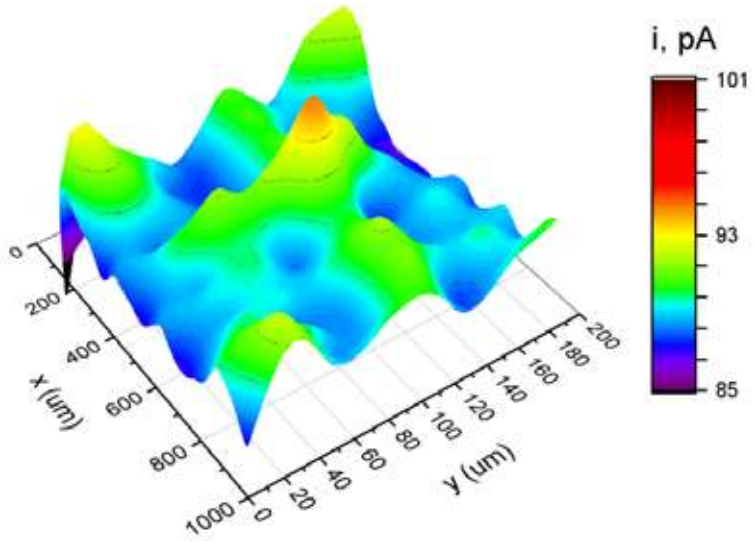

Fig. 1. Mapping of electrochemical activity of horseradish peroxidase, immobilized at 100 μm spots. Measurement was performed in buffer solution, pH 6.7 with 1 mM H_2O_2.

References
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