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# ELECTROSYNTHESIZED MOLECULARY IMPRINTED PEDOT MICRORODS FOR IgG-FITC AND Av-FITC MOLECULAR RECOGNITION

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The idea of molecular imprinting-the creating of the specific cavities in synthetic polymer matrices with memory for the template molecules - has gained rapid popularity and has been used successfully in numerous applications, such as analytical separation, catalysis, chemical and biomimetric sensors [1, 2]. Molecularly Imprinted Polymers (MIPs) are synthetic sorbents with selective binding sites generated by the presence of a target molecule, acting as template during polymerization of suitable monomers. Recently, the electrosynthesized electrically conducting polymers (ECPs) have been proposed as a good candidate for matrix in MIP structures [3]. ECPs offer the advantage of controlled deposition and growth of the polymer chain, mild synthesis conditions, high stability and compability with aqueous and organic solution, which are especially important in the case of protein imprinting, because these fragile molecules are often incompatible with the organic solvents used in most MIP synthesis. MIP systems also have theoretically promising properties for selective recognition of macromolecular compounds, such as proteins and other, but the practical realization of these systems is still a challenge. The main problem lies in the limited mobility of these molecules in the bulk of polymer networks and hence the poor efficiency of binding kinetics. Moreover, the structural complexity and large size of macromolecules lead to non-specific and heterogeneous binding sites, which in turn leads to a poor recognition ability [4]. The fabrication of Surface Imprinted Polymers (SIPs) microstructures can overcome the problems caused by hindered mass transfer of macromolecule in the highly crosslinked polymer structure. Recently, Syritski`s group in collaboration with Gyurcsányi's group in Budapest proposed a novel approach of SIP fabrication based on ECP microstructures of poly (3,4-ethilenedioxythiophene) (PEDOT) doped with polystyrene sulphonate (PSS) [5]. This method is based on the template synthesis of SIP microrods, where PEDOT serves as molecular recognition matrix, which is formed within the pores of a track-etched polycarbonate membrane (PCM) modified with a target protein – fluorescently labelled avidin (Av-FITC). PCM adsorb readily protein molecules due to their hydrophobic nature, and therefore the target protein can be fixed onto the pore walls by simple physical adsorption [5]. In present work we have adapted the novel surface imprinting technique for the preparation of SIP microrods for IgG recognition. In order to reduce the high non-specific adsorption of IgG on gold surface a thin base layer of PEDOT/PSS was electrodeposited onto the working electrode before PC membrane tightening. The specific binding of fluorescently labeled IgG (IgG-FITC) on the prepared SIP microrods was investigated by epifluorescense microscopy.

References

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