

The quartz crystal microbalance with dissipation unit (QCM-D) as a tool for the evaluation of surface biocompatibility

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Recently, a promising new approach for the identification of biomaterials' surfaces hemocompatibility using quartz crystal microbalance with dissipation unit (QCM-D) has been reported [1], [2]. Previous adsorption studies showed that surfaces with high affinity to albumin and low affinity to fibrinogen feature improved hemocompatibility [3], [4].

In this work, QCM-D was used for monitoring the adsorption of fibrinogen onto modified model PET surfaces. Figure 1 shows areal mass (ng/cm²) of adsorbed fibrinogen onto PET modified surfaces. Surfaces have been subjected to several pre-treatments including low-temperature oxygen and nitrogen RF plasma treatment and pre-adsorption of polysaccharides exhibiting anticoagulant properties such as heparin and dextran sulphate. Adsorption of fibrinogen onto treated PET surfaces compared to untreated surface of PET was found to be significantly reduced for all applied treatment methods. The use of non-equilibrium gaseous plasma opens new possibilities for improvement of biocompatibility of PET surfaces.

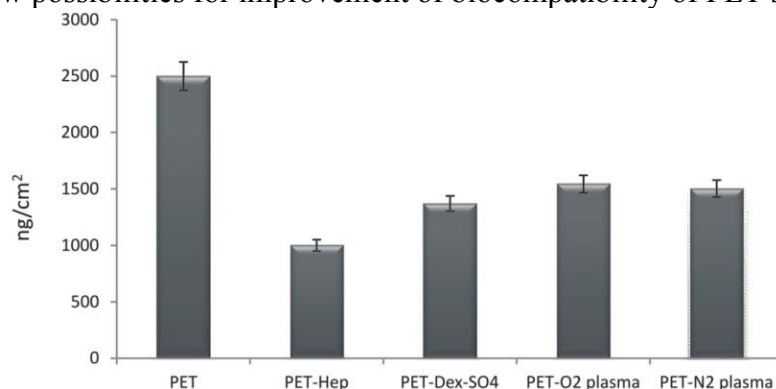


Figure 1: *Fibrinogen adsorption (mass/area at third overtone) onto non-modified (PET), polysaccharide coated (heparin, dextran sulphate) PET surfaces and plasma treated PET surfaces*

Acknowledgments

Operation part financed by the European Union, European Social Fund. Operation implemented in the framework of the Operational Programme for Human Resources Development for the Period 2007-2013, Priority axis 1: Promoting entrepreneurship and adaptability, Main type of activity 1.1.: Experts and researchers for competitive enterprises.

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