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Functionalisation of surfaces using plasma polymerization for biosensor applications STEPHEN DANIELS, R.P. GANDHIRAMAN, V. GUBALA, Dublin City University, BIOMEDICAL DIAGNOSTICS INSTITUTE TEAM, NATIONAL CENTRE FOR PLASMA SCIENCE AND TECHNOLOGY TEAM — In point of care diagnostic device platforms, immobilization of the biorecognition reagents to the polymer surface in a rapid, repeatable and controllable fashion remains a key issue. For a biosensor to work efficiently, biomolecules have to be immobilized on surfaces in their biologically active state with low non specific binding. We present a strategy for the preparation of amine-functionalised surfaces on Zeonor, a type of cycloolefin polymer, using PECVD. Amine functionalities are introduced using 3-aminopropyltriethoxysilane (APTES) and ethylene diamine EDA precursors. The reactivity of free amino groups in the coatings was evaluated by dip coating the samples in an amino-reactive fluorophore solution (lissamine rhodamine B sulfonyl chloride). Subsequently, their average fluorescence emission was measured. The distribution of amine groups on the polymer surface was carried out using amino-functionalized silica nanoparticles. The applicability of such coatings for biosensor platforms was demonstrated through the coupling of oligonucleotides to produce microarrays containing DNA. As a first step towards application of this method, we have successfully demonstrated surface activation of a next-generation prototype.

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