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Photo-ionization Potential Threshold of Single Human Fibrinogen Molecule Absorbed onto Silicon Surfaces XIANHUA KONG, JACOB GAUGUILO, ROBERT NEMANICH, Department of Physics, North Carolina State University — Human Plasma Fibrinogen (HPF), which is a protein involved in haemostasis and thrombosis, is known to readily adsorb onto artificial surfaces. Therefore, understanding the absorption process for specific surfaces is critical to establish biocompatibility. In this study, the photo-ionization potential of single HPF molecules adsorbed onto oxidized p-type silicon substrates was studied by photoelectron emission microscopy (PEEM). PEEM, using the spontaneous emission output of the Duke OK-4 free electron laser (FEL), were illuminated at tunable wavelengths between 248 and 310 nm. The photo-ionization potential threshold for single HPF molecules was found to be 4.6 $\pm$ 0.2 eV. The electronic states of the molecule were related to the electronic states of the oxidized Si surfaces. The deduced alignment of the electronic states is consistent with negative charge transfer from the adsorbed fibrinogen to the p-type silicon substrates which would proceed by tunneling through the thin oxidized layer.

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