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BSA protein adsorption on bioglass and bioceramic surfaces JOE HARMS[1], Austin Peay State University, ROMAN GOLOVCHAK[2], Austin Peay State University, Lehigh University, HIMANSHU JAIN[3], Lehigh University — Advancements in medicine have yielded biodegradable scaffolds to restore diseased or damaged tissues. Scaffolds made of bioactive glasses, specifically the 45S5 composition, are designed to fill and restore bone defects. Most of the studies in the field of 45S5 bioactive glasses have tried to model the interaction between the living tissue and the glass using Simulated Body Fluid (SBF) solution. SBF contains a concentration of ions similar to human plasma to predict in vivo bone formation. However, cells do not attach to the surface of bioglass, but through a layer of mediate adsorbed proteins. The adsorbed protein layer modifies interactions between cells and biomaterial. Not only is the composition of the adsorbed protein layer important, so is the conformational state of each protein. In present studies we report the first results on X-ray photoelectron spectroscopy (XPS) and Raman spectroscopy studies of bovine serum albumin (BSA) attachment to various surfaces of 45S5 bioglass and bioceramics. The XPS shows the amount of BSA attached to the surface depends strongly on the concentration of Ca and P. Thus Ca^{2+} and PO_4^{3-} could be identified as main protein binding sites. Conformations of BSA proteins attached at different temperatures are studied by micro Raman spectroscopy.

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