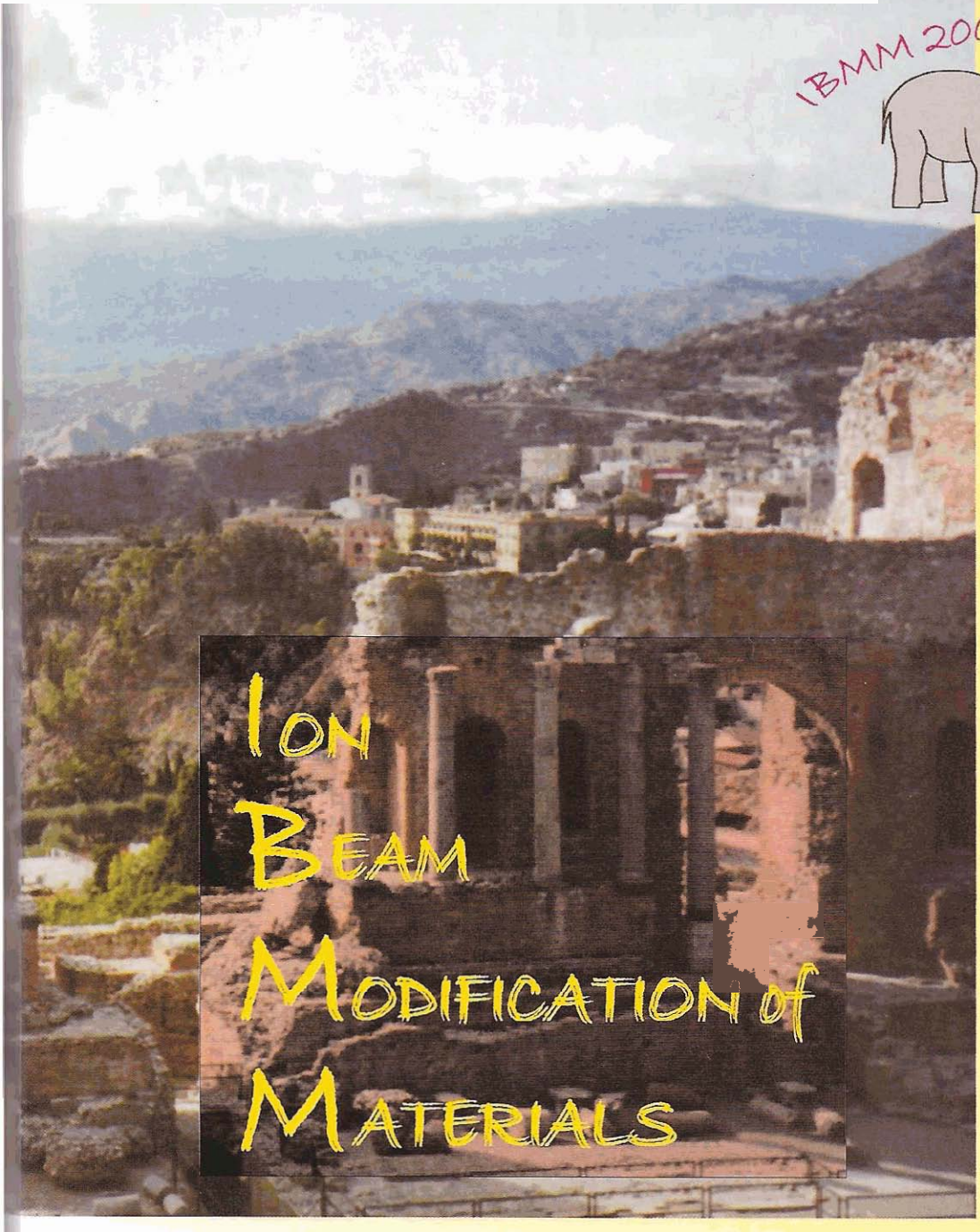

IBMM 2006

Ion Beam Modification of Materials

Program and Abstracts

15th International Conference

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The bioactivity of water, $COOH^+$ ion implantation into titanium oxide films

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Titanium oxide films were produced in plasma immersion ion implanter equipped with metal cathodic arc and radio frequency discharge plasma sources. The water vapor plasma and acrylic acid plasma were implanted into the as-deposited titanium oxide films respectively at the pulse bias of -20kv using 1000w radio frequency. The microstructure and composition were investigated using atomic force microscopy (AFM), Fourier transform infrared spectrometer (FTIR) and x-ray photoelectron spectrum (XPS). Endothelial cells were cultured on the surfaces of the treated samples. Results of x-ray photoelectron spectrum (XPS) and Fourier transform infrared spectrometer (FTIR) analysis exhibit that water vapor plasma and $COOH^+$ ion implantatiou both caused the rearrangement of chemieal bonds and the formation of some new O-containing groups. The surface morphology of modified surface is some different from as-deposited titanium oxide films. The results of endothelial cells cultured on both H_2O and $COOH^+$-implanted Titanium oxide films exhibit good adhesion and growth behavior. Our results suggest that water and $COOH^+$ ion implantation is a practical means to improve the surface bioactivity of medical implants made of titanium oxide films.

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