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## **Characterization of Plasma-Polymerized Hexamethyldisiloxane and Poly Acrylic Acid Multilayer on Magnesium Surface**

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Magnesium (Mg) is light, biocompatible and has similar mechanical properties to natural bone, so it has the potential to be used as a biodegradable material for orthopedic applications. Unfortunately, Mg has extremely poor corrosion resistance, particularly in the presence of choline ion; this limited its used as metallic biomaterials for permanent implants. Hexamethyldisiloxane (HMDSO) plasma-polymerized thin films can be assayed for a large number of applications in rather different fields such as protective anti-scratch coatings on plastic substrates, barrier films for food and pharmaceutical packing and corrosion protection layers. And hydrophilic coatings with a tunable surface density of COOH groups, such as plasma deposited poly-acrylic acid (PAA), have been investigated as cell adhesives and functional layers for the immobilization of biomolecule. In order to improve the osseointegration of the implants, the Mg surface has been modified by means of bioactive coatings plasma polymerization. The aim of this study was to investigate the metal ion release properties and cell response of HMDSO/PAA multilayer coated Mg surface using plasma polymerization. The chemical and physical properties of the HMDSO/PAA multilayers were characterized by contact angle measurements, Fourier transform infrared spectroscopy and atomic force microscopy. The biodegradation test was performed immersion in simulated body fluid. MC3T3- E1 cell were cultured on each sample and the cell attachment and proliferation were examined using MTT and ALP assay. It was found that weight loss of multilayer coated samples was lower than that of untreated samples. The cell viability tests revealed significantly enhanced viability on the multilayer coated Mg surfaces than on another surfaces. These results that the polymeric multilayers coated on Mg may be potentially applied for clinical use. (\*Corresponding Author: [kim5055@chosun.ac.kr](mailto:kim5055@chosun.ac.kr), Ministry of Education, Science and Technology (No. R13-2008-010- 00000-0))

### **Keywords**

Plasma polymerization  
Hexamethyldisiloxane  
Magnesium  
Multilayer coating