

The pre-osteoblast cell culture on titanium surface coated with fp-151-RGD and hyaluronic acid by polyelectrolyte multilayer (PEM) method

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Hybrid mussel adhesive protein (MAP), fp151-RGD, has excellent adhesion and spreading abilities. Based on its adhesive and cationic properties, fp-151-RGD is possibly suitable for use as a cell-adhesion biomaterial in any other area where efficient cell adhesion is required. In this aspect, we designed oppositely charged PEM of fp151-RGD (+) and hyaluronic acid (HA) (-) as a platform surface to improve complication of titanium-based implantation such as aseptic loosening. Each layer was deposited by spin coater, and the built-up of both fp151-RGD and HA layer were confirmed by quartz crystal microbalance and contact angle analyzer. Then, adhesion and proliferation of MC3T3-E1 pre-osteoblast cells were examined on the multilayer films by MTT methods and spreading of the cells was stained with phalloidin-FITC and DAPI and observed by fluorescent microscope. As results, we observed that fp-151-RGD and HA were well fabricated on titanium surface and the adhesion, proliferation and spreading properties of the MC3T3-E1 cells were superior on the surface-treated titanium to bare titanium surface. Our results suggest that PEM using fp151-RGD and HA can be applied as an efficient coating method for titanium-based implant.