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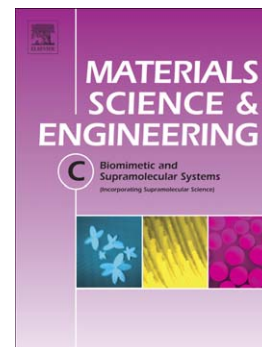
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## Surface characterization and cytotoxicity analysis of plasma sprayed coatings on titanium alloys

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### Abstract:

In the realm of biomaterials, metallic materials are widely used for load bearing joints due to their superior mechanical properties. Despite the necessity for long term metallic implants, there are limitations to their prolonged use. Naturally, oxides of titanium have low solubilities and form passive oxide film spontaneously. However, some inclusion and discontinuity spots in oxide film make implant to adopt the decisive nature. These defects heighten the dissolution of metal ions from the implant surface, which results in diminishing bio-integration of titanium implant. To increase the long-term metallic implant stability, surface modifications of titanium alloys are being carried out.

In the present study, biomimetic coatings of plasma sprayed hydroxyapatite and titanium were applied to the surface of commercially pure titanium and Ti6Al4V. Surface morphology and surface chemistry were studied using scanning electron microscopy and x-ray photoelectron spectroscopy, respectively. Cyclic potentiodynamic polarization and electrochemical impedance spectroscopy were carried out in order to study their electrochemical behavior. Moreover, cytotoxicity analysis was conducted for osteoblast cells by performing MTS assay. It is concluded that both hydroxyapatite and titanium coatings enhance corrosion resistance and improve cytocompatibility.

### Keywords:

Cytocompatibility, orthopedic implants, hydroxyapatite, titanium, biomimetic, osseointegration, corrosion.

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