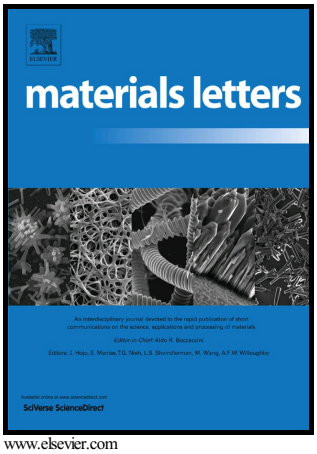

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Enhanced human osteoblast cell functions by "net-like" nanostructured cell-substrate interface in orthopedic applications

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Abstract

In this study, a novelty "net-like" nanostructured cell-substrate interface to enhance the human osteoblast cell's functions in orthopedic applications was proposed. This novelty "net-like" nanostructured surface was fabricated on 316L stainless steel by using ultrasonic shot peening. The *in vitro* study indicated that this "net-like" nanostructured cell-substrate interface could significantly enhance the attachment, spreading and proliferation rate of the human osteoblast cells (Saos2) compared with the as-received surface with coarse grains. The enhancement of cell functions could be attributed to the high density grain boundaries in the "net-like" nanostructured surface, which could promote protein adsorption when material comes in contact with biological environments.

Keywords: "Net-like" nanostructured cell-substrate interface; Metals and alloys; Ultrasonic shot peening; Human osteoblast cell; Biomaterials.