EXPLORING NOVEL MATERIALS AND SURFACE TREATMENTS TO IMPROVE ENDOPROSTHESIS

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Among the most impeding conditions for a patient are those affecting the skeleton. Complex fractures, surgical removal of tumours, congenital malformations and other bone and joint diseases require the use of prosthesis and bone substitutes. The former are used to replace permanently missing bones or joints, and the latter are used to fill cavities caused by disease or trauma, and they are expected to get resorbed as new bone is regenerated. Prosthesis are usually made of titanium and fail in the long-term due to poor osseointegration. A problem that could be fixed by modifying both the surface and the design of the prosthesis in order to achieve a better interaction with the patient’s tissue. Bone substitutes, on the other hand, tend to fail due to incomplete resorption or inappropriate interaction with the surrounding tissue, a question that has prompted the search for new materials and formulations with increased biocompatibility and bone-like features. This work explores tailoring the surface and shape of titanium prosthesis in order to improve osseointegration, and also the use of novel biomaterials to be used as bone substitutes.

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