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FUNCTIONALLY GRADED SURFACES FOR OSSEOINTEGRATED IMPLANTS

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Lifetime of osseointegrated implants depends on the capability of the surface of the implant to promote osteoblast (bone-forming cells) adhesion as fast as possible in order to anchor the implant in place after mineralization. Nevertheless, the intrinsic low resistance to wear of Ti-based materials, mainly used for these applications, may compromise its biological performance. In fact, degradation by tribocorrosion mechanisms (corrosion + mechanical wear) results in the modification of the surface characteristics of the material, but, at the same time, generates micro or nano-sized debris and/or metallic ions that may have a deleterious effect on the biological functions locally and systemically. In this work the surface properties of titanium were tailored, by a graded structure, to ensure enhanced biological properties, corrosion and wear resistance.