CHARACTERIZATION OF TITANIUM SURFACE MODIFIED BY CALCIUM TITANATE

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Coatings based on apatite and others that contain calcium play an important role for the osseointegration with the implant. It is believed that released calcium induces a specific biological response to the living tissue establishing a stable chemical bonding between formed bone and implants. The mechanical anchorage of implants also depends on the surface structure and morphology. In this work, the titanium surface was modified by calcium titanate, which was deposited by sol-gel method combined to the *dip coating* technique followed by heat treatments. Two different emersion rate (5 and 10 cm/min) were used as well as the number of coatings were varied. The temperature of this treatment was established based on the results of the thermal analysis (TG/DTA). The surfaces were characterized by X-ray diffractometry (DRX), Scanning Electron Microscopy (SEM) and water contact angle measurement. The corrosion behavior of modified surfaces was evaluated by electrochemical method (polarization curves) in balanced saline Hanks solution. Finally, biological test was carried out by the analysis of cellular viability and adhesion of MC3T3-E1 (subclone 4), mouse pre-osteoblastic cells (ATCC CRL-2593), using MTT and crystal violet assays, respectively, after 24h incubation at 37^{o}C in 5% CO_2 atmosphere. The coating consists of anatase TiO_2 (PDF 21-1272) and calcium titanate ($CaTiO_3$, PDF 43-226). SEM analysis showed that homogeneous films with 0.8µm of thickness are provided when they are prepared by only one immersion and that the films increase the resistence to corrosion. The coating increases the wettability as the water contact angle decreases from 90^{o}±10^{o} for cp Ti (low interstitial titanium) to 34 ^{o}±5^{o}. The biological test shows that the modifications do not interfere on the osteoblast viability and adhesion, however, the morphological analysis of preosteoblasts cultured on the modified Ti-surface by SEM shows that the coatings promote a cell spreading.

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