At the present time Titanium (Ti) is considered the best material for endosseous dental implants since it promotes osseointegration as has been seen in vivo. However, most of the authors propose that titanium success is due to the intrinsic properties of its native oxide. In order to verify this assertion, we have designed and experiment to evaluate in vitro the differences in cell adhesion between pure titanium surfaces and grown TiO$_2$ surfaces [1-4].

In this work, we have studied cell adhesion by cell-attachment assay on surfaces of commercially pure Titanium (cpTi) and coatings of crystalline (cTiO$_2$) and amorphous titanium oxide (aTiO$_2$), which were deposited by magnetron sputtering. The surfaces were analyzed by X-ray photoelectron spectroscopy in order to clearly identify the surface composition and the surface wettability was analyzed by sessile drop contact angle. Human osteoblasts from jaw were employed in the cell-attachment assay. There were two groups in the assay: group 1 with Fetal Bovine Serum (FBS) to provide adhesion proteins and group 2 without FBS (FBS-free). The results showed a chemical composition similar in both coatings cTiO$_2$ and aTiO$_2$; both had oxidation state of Ti(IV) indicating a stoichiometric oxide. However, the cpTi showed besides the Ti(IV) signal, some traces of metallic Ti and Ti(II) referent to native oxide layer poor in oxygen. The contact angle, however, showed that the three surfaces have similar wettability; they were hydrophilic with a contact angle of 62°±2°. In relation to the cell attachment assay, the cTiO$_2$ and aTiO$_2$ coatings showed excellent cell adhesion in both groups; with and without FBS whereas cpTi only had good cell adhesion when FBS was used.

**Keywords:** Titanium, Titanium Oxide, Cell Adhesion

**References:**


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