Titanium (Ti) started to be used as a medical material, soon after the second world war, it has good properties such as biocompatibility, osseointegration and high corrosion resistance in corrosive environments[1]. Nowadays, Ti is considered the best metal for biomedical applications, superior to, for example, stainless steel 316L (SS), which is also used in biomedical application but, it does not present osseointegration and the corrosion resistance is much lower than Ti [2-3].

In this work, we have compared the response of both metals; Ti and SS to simulated inflammatory conditions. The simulated conditions were achieved by summering the metals into H$_2$O$_2$ rich solutions for seven days. Then, the surface modifications and cell adhesion and cell differentiation were compared. 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. Electrochemical Impedance Spectroscopy was used to study the surface electrochemical response before and after the H$_2$O$_2$ treatment. Human osteoblasts from jaw were used to evaluate the cellular adhesion and differentiation. The results showed that the surface chemical composition changed in both materials after the treatment; the native oxide layers were observed to growth; for both metals, complete oxidized metals were detected after the treatment. The contact angle showed that surfaces after the treatment were more hydrophilic; for Ti, the angle changed from 61.5°± 1.5 to 36° ± 2.5 and SS changed from 65°± 0.7 to 50° ± 0.5. In relation to the cell adhesion, it was evident that Ti presented better cellular adhesion than SS and the response was even more obvious after the treatment.

**Keywords:** Titanium, Stainless Steel 316L, Cell Adhesion

**References:**


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