CYTOTOXICITY EVALUATION OF SILOXANE COATED TITANIUM OBTAINED BY SOL-GEL METHOD AFTER ANODIZATION IN CONVENTIONAL ACIDS OR *Psidium guajava* EXTRACT

Felipe Gustavo Dias, Gabriela Zimmermann Prado Rodrigues, Isadora Schell Frozza, Sandra Raquel Kunst, Claudia Trindade Oliveira, Ana Luiza Ziulkoski

Universidade Feevale, Novo Hamburgo – RS - Brazil

INTRODUCTION: Titanium is widely used in implants; however, the release of metal ions can lead to cytotoxicity. Anodization produces a protective oxide layer that mitigates these effects. Moreover, this surface can be further enhanced with siloxane-based coatings, which offer stability and corrosion resistance. OBJECTIVE: This study evaluates the cytotoxicity of a siloxane coating obtained via the Sol-Gel method as an alternative strategy to improve the titanium surface after anodization. For this purpose, 1×1 cm titanium plates were subjected to three anodization electrolytes: phosphoric acid (H_3PO_4), a combination of phosphoric and hydrofluoric acids (H_3PO_4 + HF) and *Psidium guajava* leaves extract. Each group was analyzed with and without the application of the siloxane coating to assess the impact of the coating on cell viability. MATERIALS AND METHODS: The cytotoxicity of the siloxane-based coating was evaluated using human osteosarcoma cells (Saos-2) cultured in DMEM supplemented with 10% FBS. The assay was performed in microplates using confluent monolayers of cells incubated with extraction medium (EM) for 24 hours at 37°C and 5% CO_2. The EM was obtained by incubating titanium plates in culture medium for 24 hours at 37°C. As a negative control, only DMEM with 10% FBS was used. Cell viability was assessed by the colorimetric Neutral Red uptake and the MTT reduction assays. Statistical analysis was performed using ANOVA followed by Tukey's post hoc test ($p \leq 0.05$). RESULTS AND CONCLUSION: For MTT assay, the coating of anodized titanium with siloxane prevented the increase in mitochondrial activity typically observed after anodization with acidic electrolytes, reducing this increase by 38% for H_3PO_4 and by 30% for H_3PO_4 + HF. For NRU assay, no difference was observed for these samples. The siloxane layer probably minimizes the leaching of species capable of interfering with mitochondria's oxidative status. Samples from *Psidium guajava* electrolyte didn't show alterations for either assay. Taking together, our results demonstrated that the anodized plates—regardless of the electrolyte used—and the siloxane coating maintained 100% cell viability, comparable to the negative control. In conclusion, the siloxane coating does not cause cytotoxicity and may be a promising strategy for surface preservation.

Keywords: titanium microplates; surface treatment; Saos-2 cell line

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