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In vitro hemocompatibility studies of Ti alloys for biomedical application

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Titanium alloys have been investigated for several years with regard to biomedical applications. However, the ideal material must present elastic modulus near to the bone in order to avoid stress shielding phenomenon. So, in this study was investigated In vitro hemocompatibility response of the binary and ternary titanium alloy. Ti-30 Ta and Ti10Mo8Nb. According to ASTM F756-08 (2013) the hemolysis test is considered as a type of in vitro cytotoxicity test due to assess the biocompatibility of the material in contact with blood. This test measures the red blood cell response when the alloy surface was to contact with the blood. Disruption on cell membrane occurs when the material is not hemocompatible causing hemoglobin release. The hemocompatibility was evaluated by hemolysis. In the hemolysis test, 1 ml of 2% potassium oxalate solution was added into 20 ml of fresh human blood for anticoagulation treatment. All the test samples were dipped into silanized glass tubes with 10 ml of 0.9% saline and incubated at 37 °C for 30 min. At the same time, the negative control (10 ml of 0.9% saline) and the positive control (10 ml of de-ionized water) were also incubated at 37 °C for 30 min. During this treatment, the human blood was diluted with 25 ml of 0.9% saline. Then, 0.2 ml of diluted blood was added into each glass tube and the mixtures were incubated for 60 min at 37 °C. Afterward, the suspensions were centrifuged at a rate of 3000 rmp for 5 min. The absorbance of the supernatants was obtained using an ultraviolet spectrophotometer Femto C432(UV-752). Each hemolysis result was an average of three measurements. The results showed Group I- Ticp, Group II- Ti-30Ta and group III- Ti10Mo8Nbor both samples are below the tabulated indices. The values were statistically evaluated, considering $p < 0.05$, with no significant differences between the samples.