**HUMAN CELLS survivability as a function of**

**implant surface topography**

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Titanium-based alloys are widely employed in biomedical applications (including bone replacing implants) due to their favourable combination of good mechanical properties and biocompatibility [1]. The latter depends not only upon chemical and physical properties of the implanted materials, but also on the interaction between the body cells and the material surfaces [1]. A variety of implant surface modification techniques was investigated in terms of their effect on implants biocompatibility [2], including classic metallographic grinding and polishing causing fine-grooved surface topography.

In this study we investigated the effect of surface topography on biocompatibility of the Ti-6%Al-4%V alloy (being known as VT6 according to GOST 19807-91). The surfaces with controlled and systematically changing roughness were obtained by mechanical grinding using a series of abrasive sandpapers, and by fine polishing with diamond pastes.

Surface topography of the samples was characterized by light microscopy and confocal microscopy, with the emphasis on quantitative evaluation of the roughness parameters according to ISO 25178. Biocompatibility was studied by HEK-293 cells adhesion onto the studied surfaces.

We demonstrated that abrasive paper grinding caused one-directional grooved surfaces, whereas the diamond paste polished surfaces appeared to be a superposition of significantly smooth areas with a regular network of deep pits.

Our biocompatibility (cell adhesion) results demonstrated that the fine abrasive paper (10-15 µm grain size) grinding, causing one-directional ordered grooved surface, is distinctly favourable for cell survivability, while the adhesion to smoothly polished surfaces appearss to be low.

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