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Hemocompatibility of Superhemophobic Titania Surfaces SANLI MOVAFAGHI, VICTORIA LESZCZAK, WEI WANG, JONATHAN SORKIN, KETUL POPAT, ARUN KOTA, Colorado State University — Titanium-based implants have received a great deal of attention for their biocompatibility with many different tissues in the human body. However, when these implants come in contact with blood, platelet adhesion and activation occur, which may lead to further thrombosis and sometimes failure of these implants. In this work, we demonstrated a novel strategy to improve the hemocompatibility of titanium-based implants. This strategy consists of altering the blood-contacting surfaces of titanium-based implants and making them superhemophobic (i.e., extremely repellent to blood). The superhemophobic surfaces are so repellent to blood that droplets of blood bead up and roll off from the surface without sticking to it. Further, we investigated the blood platelet adhesion and activation of superhemophobic surfaces and compared them with that of hemophobic surfaces (i.e., surfaces display contact angles >90with blood) and hemophilic surfaces (i.e., surfaces display contact angles <90with blood). Our results indicate that superhemophobic surfaces display significantly lower platelet adhesion and activation and so an improved hemocompatibility compared to hemophobic and hemophilic surface. We envision this simple and scalable fabrication technique will lead to improved hemocompatible, superhemophobic medical implants.

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