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Searching for markers to detect autologous blood transfusion. An investigation on platelets activation by flow cytofluorimetry

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Abstract

Blood transfusion (BT) is a practice banned by the World Anti-Doping Agency (WADA) used by cheating athletes to increase the rate of oxygen transport to tissues with the aim to improve sport performance. At present, a method for the detection of Homologous Blood Transfusion (HBT) has been implemented by the WADA accredited anti-doping laboratories worldwide, while no internationally recognized method has been finalized so far for the direct detection of autologous blood transfusions (ABT), which can at present be revealed only by targeted longitudinal profiling of key blood parameters. The present article reports the results aimed to verify whether platelet activation markers and platelet microparticles (PMPs) could represent reliable direct or indirect markers for the detection of blood transfusion (both homologous and autologous) using flow cytofluorimetry. Our results indicate that platelet microparticles (PMPs) detection seems to be a better and more sensitive approach to analyze platelet activation by flow cytofluorimetry. We also extended the analysis to the detection of microparticles of erythrocytes origin (EMPs) and found that EMPs can represent an additional sensitive marker that is affected by the storage of a blood sample.