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Data Article

Data on how several physiological parameters of stored red blood cells are similar in glucose 6-phosphate dehydrogenase deficient and sufficient donors

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ABSTRACT

This article contains data on the variation in several physiological parameters of red blood cells (RBCs) donated by eligible glucose-6-phosphate dehydrogenase (G6PD) deficient donors during storage in standard blood bank conditions compared to control, G6PD

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Abbreviations: AnnV, annexin V; CPD, citrate-phosphate-dextrose; FRAP, ferric reducing antioxidant power; FSC, forward scatter; G6PD, glucose-6-phosphate dehydrogenase; $G6PD^-$, G6PD deficiency; Hb, hemoglobin; Hct, hematocrit; K^+, potassium; MCF, mean corpuscular fragility; MFI, mechanical fragility index; MP, micoparticles, microvesicles; MPPA, microparticles pro-coagulant activity; NAC, N-acetylcysteine; NS, non-stored; PBS, phosphate buffer saline; PCI, protein carbonylation index; PS, phosphatidylserine; RBC, red blood cell; RFU, relative fluorescence units; ROS, reactive oxygen species; SAGM, saline-adenine-glucose-mannitol; SSC, side scatter; TAC, total antioxidant capacity; tBHP, *tert*-Butyl hydroperoxide; UA-dep AC, uric acid dependent antioxidant capacity; UA-ind AC, uric acid independent antioxidant capacity

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sufficient ($G6PD^+$) cells. Intracellular reactive oxygen species (ROS) generation, cell fragility and membrane exovesiculation were measured in RBCs throughout the storage period, with or without stimulation by oxidants, supplementation of N-acetylcysteine and energy depletion, following incubation of stored cells for 24 h at 37 °C. Apart from cell characteristics, the total or uric acid-dependent antioxidant capacity of the supernatant in addition to extracellular potassium concentration was determined in RBC units. Finally, procoagulant activity and protein carbonylation levels were measured in the microparticles population. Further information can be found in "Glucose 6-phosphate dehydrogenase deficient subjects may be better "storers" than donors of red blood cells" [1].

Specifications Table

Subject area	Biology
More specific subject area	Biology of erythrocytes stored in blood banks for transfusion purposes
Type of data	Graphs, figures
How data was acquired	Cell fragility tests, hemolysis and total antioxidant capacity were measured spectrophotometrically. Reactive oxygen species were quantified by fluorometry. Supernatant potassium and microparticles were assayed using Elecsys Systems Analyzer (Roche) and flow cytometry, respectively. Microparticles' pro-coagulant activity and protein carbonylation were measured by Elisa assays. Metabolomics analysis was performed by ultimate high pressure liquid chromatography-mass spectrometry coupled online with a Q Exactive system.
Data format	Analyzed
Experimental factors	Intracellular ROS generation was measured in energy depleted stored RBCs (incubation for 24 h at 37 °C). Osmotic and mechanical fragility indexes were estimated in situ or after incubation of stored RBCs at the same conditions (24 h/37 °C). Apart from microparticles' and metabolomics analysis, all other assays were performed on day 42 samples with or without supplementation of the units with 2.5 mM N-acetylcysteine (NAC).
Experimental features	Physiological characteristics of stored RBCs and supernatants and malate variation were examined in RBC units donated by $G6PD^-$ and $G6PD^+$ eligible donors. Most measurements were performed at week intervals of the storage period. NAC supplementation was applied to aliquots of the RBC units on day 21 of storage and the effects were analyzed on day 42 samples.
Data source location	National and Kapodistrian University of Athens (NKUA), School of Science, Athens 15784, Greece Technological and Educational Institute of Athens, Athens 12210, Greece University of Colorado, School of Medicine–Anschutz Medical Campus, Aurora, 80045 CO, USA
Data accessibility	Data with this article