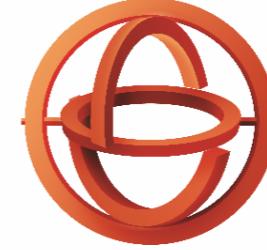


Description of Funded Research Projects

1st Call for H.F.R.I. Research Projects
to support Post-Doctoral Researchers



H.F.R.I.
Hellenic Foundation for
Research & Innovation

Research Project Title:

**Storability and Post-transfusion
Performance of Erythrocytes from beta-
Thalassemia minor Donors**

Principal Investigator:
Vasileios Tzounakas



Popular Title:
beta-thalassemia carriers as blood donors

Scientific Field:
Life Sciences

Host Institution:
National and Kapodistrian University of
Athens

Effective ex vivo storage of red blood cells (RBCs) is an essential requirement for medical practice. However, stored RBCs undergo a series of time-dependent physiological, structural and biochemical alterations (the “RBC storage lesion”), which are only reversible to some extent post transfusion. RBC storage lesion is probably related to the in vivo recovery of RBCs as well as to some of the adverse post-transfusion effects. Beta thalassemia minor (Tm) is frequent in subjects of Mediterranean descent and the most common cause of chronic hemolytic anemia in Greece. Tm donors with normal Hb levels are not excluded from regular blood donations. In addition, the so-called “donor variation effect” that refers to the tremendous variability in the storage capacity of blood from different donors is partly attributed to genetic factors that affect RBCs homeostasis. The aim of this study is to test for the first time the hypothesis that Tm blood, directly or indirectly, might affect the storability of RBCs and the efficacy of the transfusion therapy. To this purpose, in the current project we will study the regular Tm blood donors in three levels: 1) In fresh blood, 2) During storage of pRBC units in standard blood bank conditions and 3) Post-storage in order to understand the influence of beta thalassemia traits in RBC physiology, metabolism, storability and post-transfusion efficacy and survival. The profile of Tm donors pre- during and post-storage and the possible differences between the two groups under examination will be assessed by means of electron microscopy, hematological and physiological indexes, redox biology assays, metabolomics analysis and experimental models of post-transfusion survival.

The currently proposed project is expected to have an impact on society by: 1) Determining the quality of thalassemia minor (Tm)-RBCs. These results might discourage transfusion centers from enrolling Tm subjects as routine donors or encourage these subjects to start donating blood, increasing blood availability in these areas. 2) Guiding future clinical trials to the examination as to whether Tm subjects might be accepted as routine blood donors, which is relevant in that transfusion guidelines in the Mediterranean might be changed accordingly. 3) Lead to the effective management of Tm RBCs units by blood donation services according to their storage characteristics, in order to gain the optimum from each donor. 4) The effective management (stored RBCs logistics) and evolution of storage systems powered by this project will lead to an economical improvement of transfusion-associated services. 5) As a result, the long-term objective of improved personalized transfusion medicine could be achieved.

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This funding gives the opportunity to study the effect of donor-associated beta-thalassaemia trait in the outcome of transfusion therapy in a country like Greece in which both the frequency of those carriers and the demands of volunteer blood donation are especially high. Moreover, the principal investigator has the chance to continue his research at the National and Kapodistrian University of Athens and collaborate with world pioneers in the field metabolomics at the University of Colorado. Nevertheless, this financial support leads to the formation of a dynamic and dedicated group of young scientists, that would be difficult to be constructed otherwise.

*The Principal Investigator,
Vasileios Tzounakas*

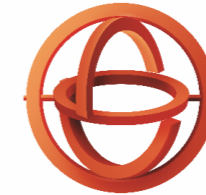
Funding

Amount: **180,000 €**

Duration: **34 months**

Foundation: **H.F.R.I.**





H.F.R.I.
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Research & Innovation

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