Young RBC Subpopulation from Frequent Senior Blood Donors Has Lower Hemoglobin-Oxygen affinity

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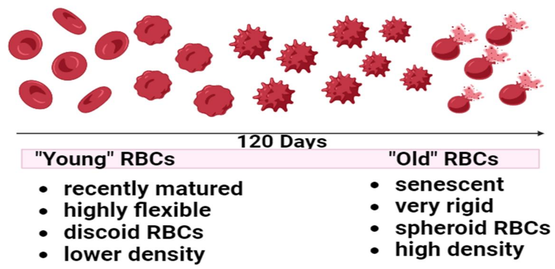
INTRODUCTION AND OBJECTIVE

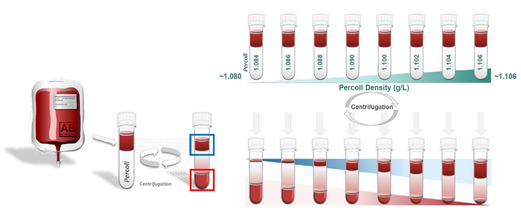
Red Blood Cell (RBC) products are heterogenous distribution of RBC subpopulations from young (recently matured) to old (senescent) cells. Thus, some products could have a higher proportion of young recently matured RBCs due to increased erythropoiesis in some donor groups. p50 refers to the partial pressure of oxygen (pO2) in blood at which hemoglobin is 50% saturated with oxygen. Frequent blood donations may alter the quality of blood components by modulating RBC characteristics.

Objective: Evaluate hemoglobin-oxygen affinity of the subpopulation of "young" and "old" RBCs during hypothermic storage as a function of the blood donor age and frequency of blood donation.



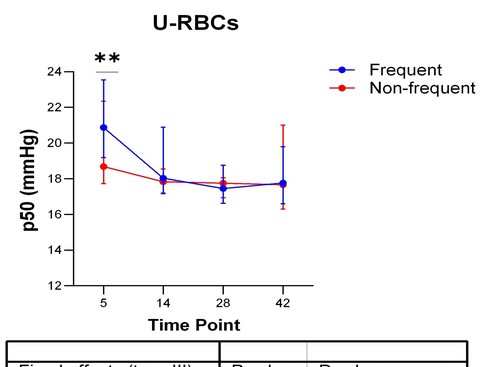
METHODS AND STUDY DESIGN

	Teen < 18 y.o	Senior > 75 y.o
Frequent (> 3 donation per year)	n=5	n=5
Non-frequent (1 donation per year)	n=5	n=5



Percoll separation

RESULTS



Fixed effects (type III)	P value	P value summary
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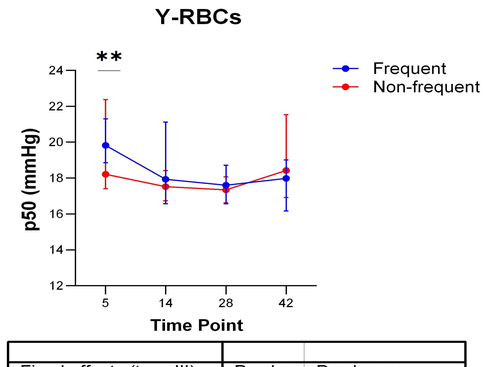
Group ID	0.3739	ns
Time Point x Group ID	0.7168	ns



Fixed effects (type III)	P value	P value summary
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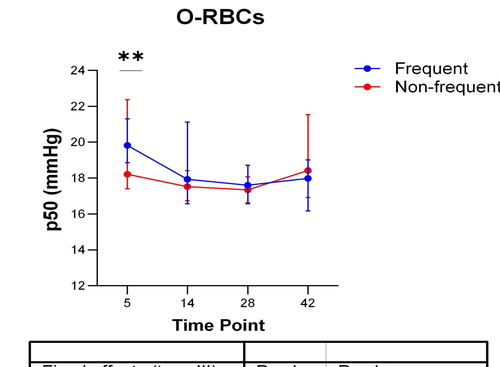
Group ID	0.8464	ns
Time Point x Group ID	0.8059	ns



Fixed effects (type III)	P value	P value summary
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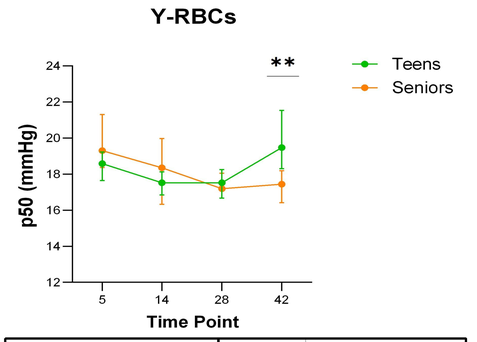

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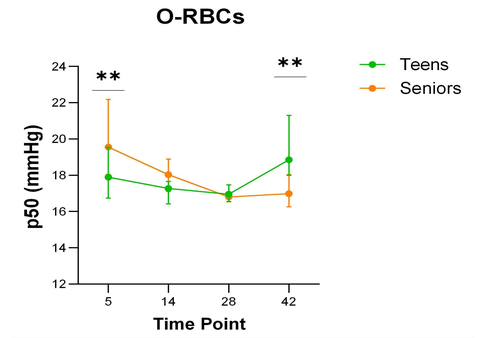

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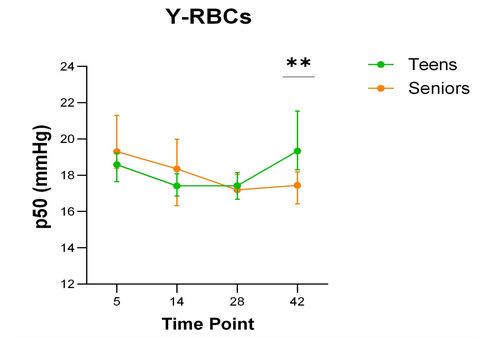

Fixed effects (type III)	P value	P value summary
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Group ID	0.7001	ns
Time Point x Group ID	0.0004	***

CONCLUSIONS

- The frequency of blood donations might impact the distribution of Y-RBCs, by inducing Y-RBCs release to blood circulation and influencing the hemoglobin-oxygen affinity of red blood cells.
- This, in turn, could affect the effectiveness of blood transfusions, leading to higher oxygen release in recipients receiving blood from frequent donors.

ACKNOWLEDGEMENTS

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