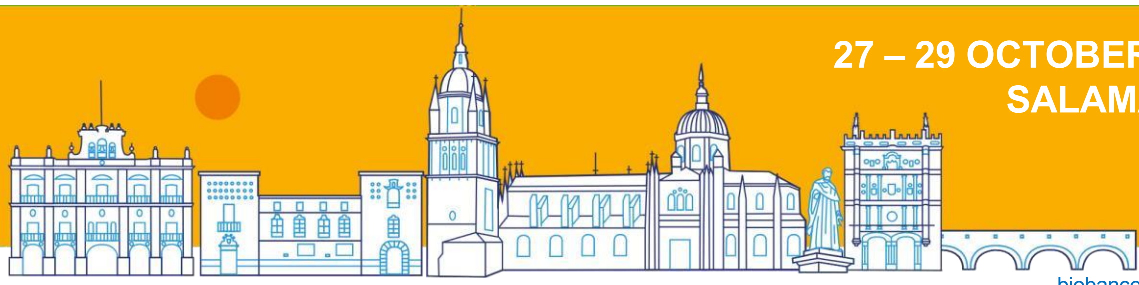

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Freeze-drying as a Sustainable and Safe Strategy for Storing Biological Samples in Biobanks: Pilot Study

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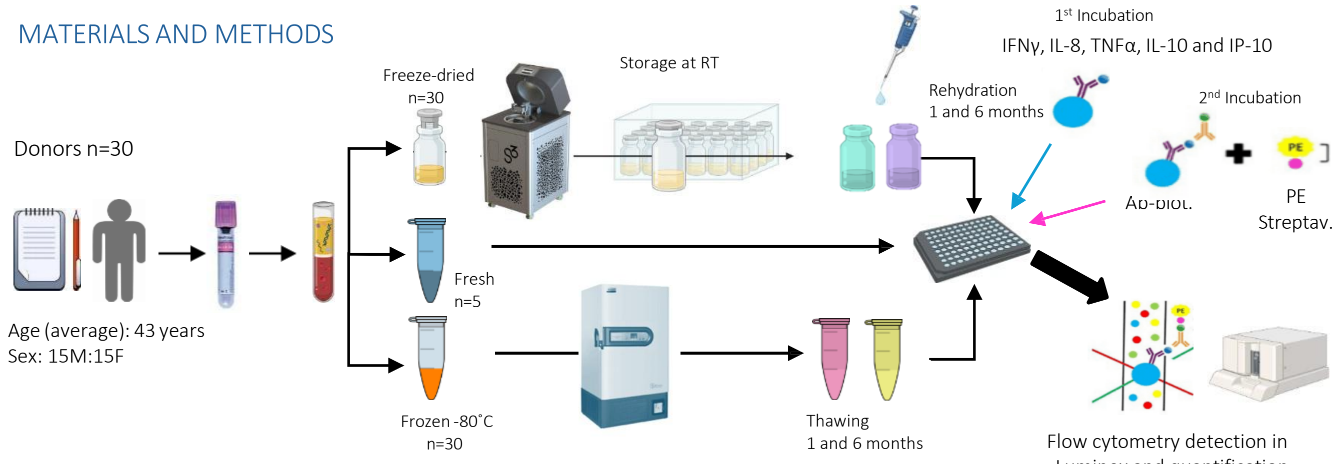
INTRODUCTION

As part of the Biobank's continuous improvement initiatives, and in line with its sustainability and environmental impact reduction objectives, the validation of alternative methods for storing and shipping biological samples has been proposed. Among these, freeze-drying stands out for allowing storage at room temperature, eliminating the need for refrigeration, which entails high vulnerability to electrical or mechanical failures that can irreversibly compromise the integrity of biological samples.

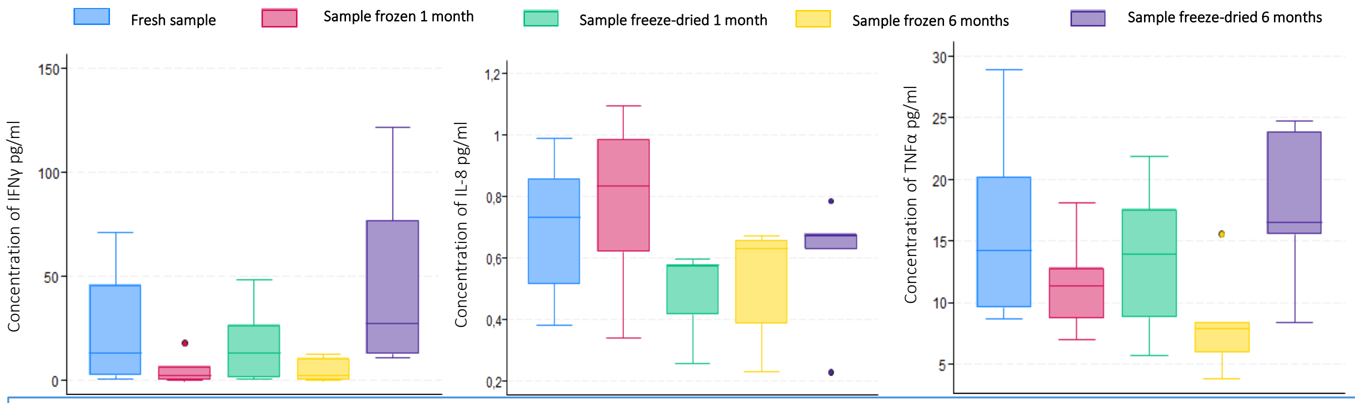
OBJECTIVE

To evaluate the concordance in the functionality of platelet-poor plasma (PPP) samples stabilised by freeze-drying according to the 300K Solutions system compared to freezing, analysing the expression of the markers: IFNγ, IL-8, TNFα, IL-10 and IP-10 after 1 and 6 months of storage.

MATERIALS AND METHODS



RESULTS



The concentration of IFNγ, IL-8 and TNFα obtained after freeze-drying is more similar to that of fresh samples than frozen samples at both storage times.

Frozen samples for IFNγ, IL-8, TNFα, and IL-10 at 1 month and 6 months, showed lower concentrations than the freeze-dried ones, except in the case of IP-10, where the concentration values after freeze-drying are significantly lower.

Frozen vs Freeze-dried	After 1 month		After 6 months	
	Difference from the average	95% CI Bland –Altman limits	Difference from the average	95% CI Bland -Altman limits
IFNγ	-9.2	-63.2-44.8	-31.4	-129.6-66.8
IL-8	-0.3	-4.5-3.9	-1.0	-9.5-7.5
TNFα	-1.6	-18.6-15.3	-7.1	-31.5-17.2
IL-10	0.4	-2.9-3.6	2.3	-49.4-54.1
IP-10	115.6	-19.5-250.7	112.1	-71.3-295.5

CONCLUSION

Preliminary results support freeze-drying as an alternative for sample storage. However, further studies with larger sample sizes and different markers would be necessary to validate the method.

AGRADECIMIENTOS

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