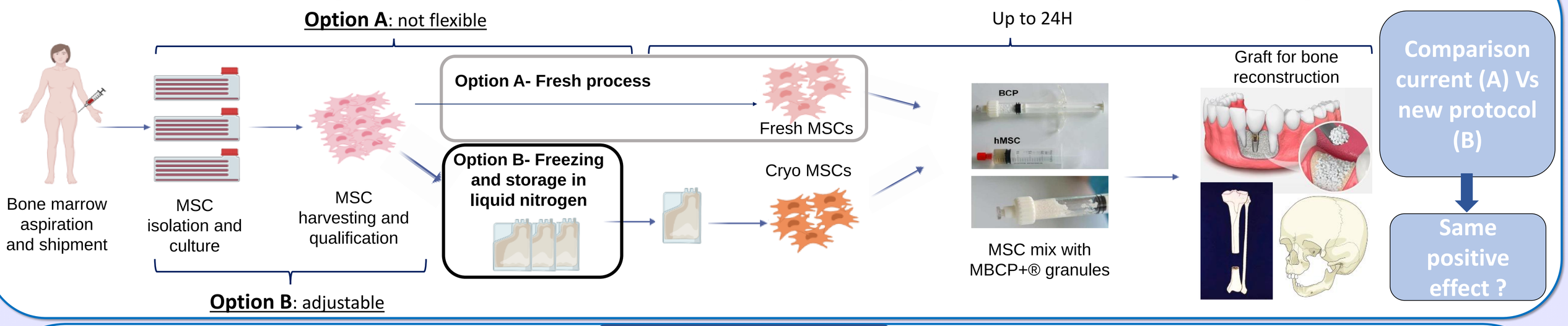
DIRECTLY THAWED BONE MARROW MESENCHYMAL STROMAL CELLS RETAIN MECHANISM OF ACTION AND SUPPORT BONE CLINICAL TRANSLATION

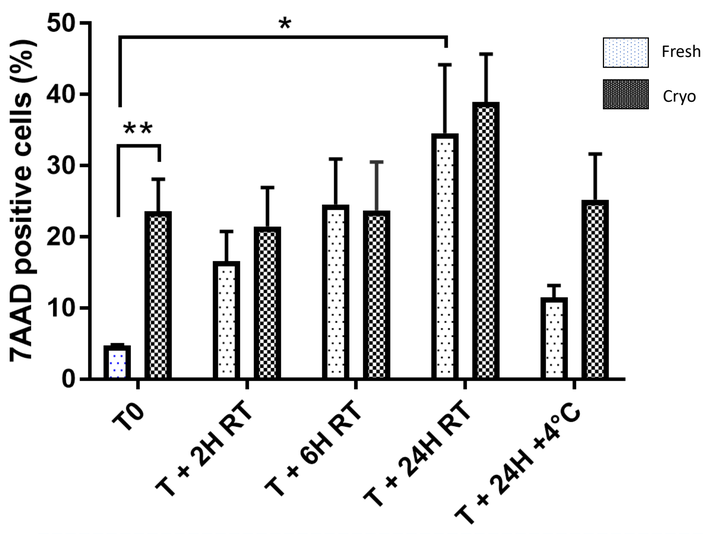
Tiffany MARIE, Andreea COJOCARU, Laura COQUELIN, Elina VARAILLON, Hélène ROUARD, Nathalie CHEVALLIER
IMRB U955-E10, Inserm, Unité d'Ingénierie et de Thérapie Cellulaire - Etablissement Français du Sang, Université Paris-Est, Créteil, France

Current **clinical trials** using BM-MSCs (OrthoUnion / Maxibone) for bone regeneration → positive results but **logistic limitations**



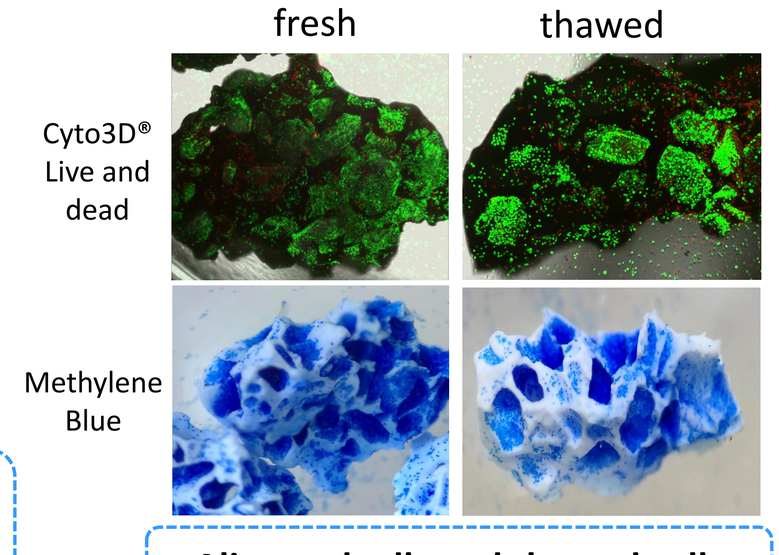
In vitro evaluation

Cell death



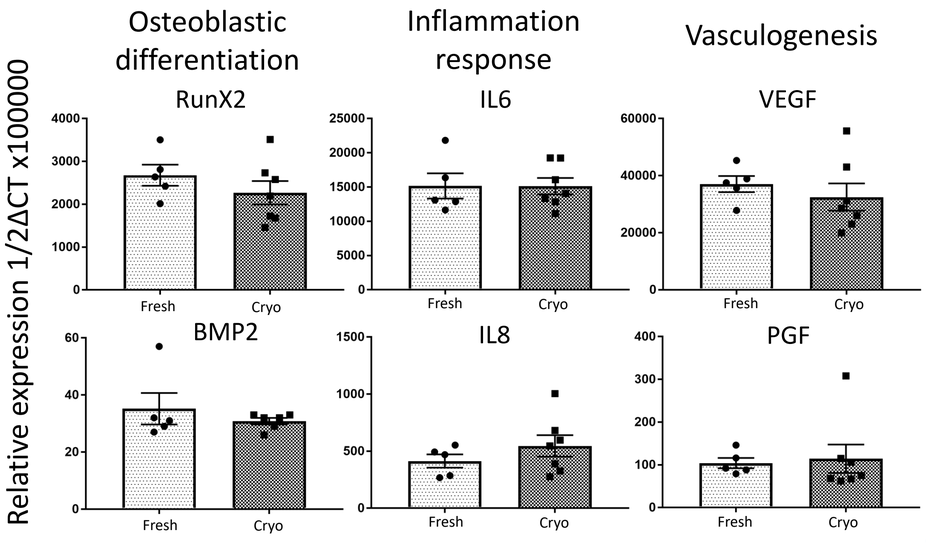
T0 → Significative difference 5% Vs 24%
T+ 2H → No more difference
T + 24H → Best cell viability at 4°C

Cell adhesion on MBCP+®



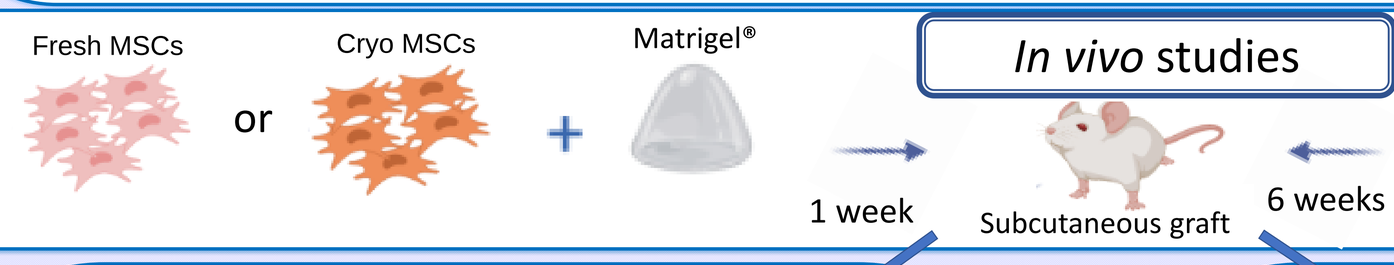
Alive and adhered thawed cells

Gene profile expression immediately after harvesting or thawing



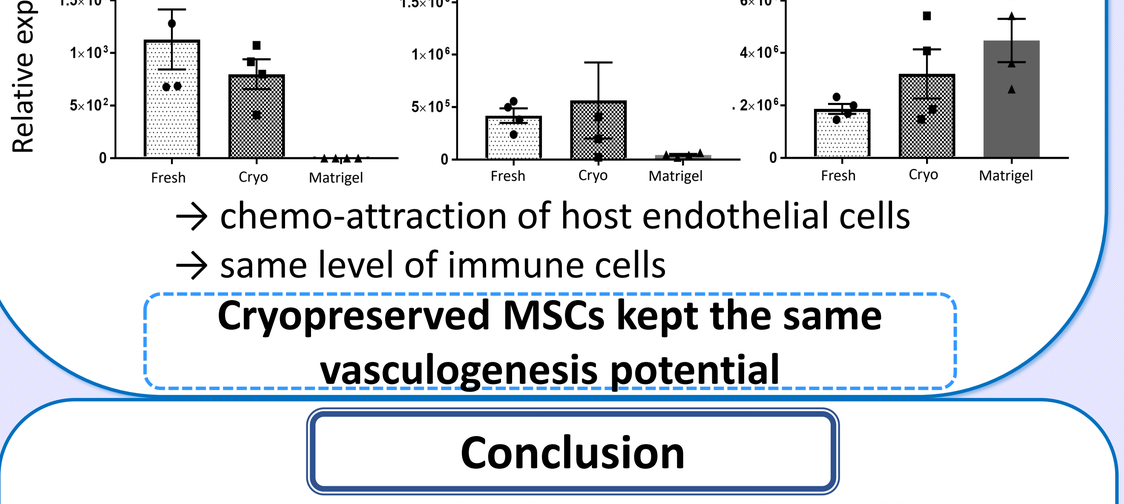
No difference between conditions

In vivo studies



Vascularization ?

Histology



→ observation of vessel-like structures confirmed by IF

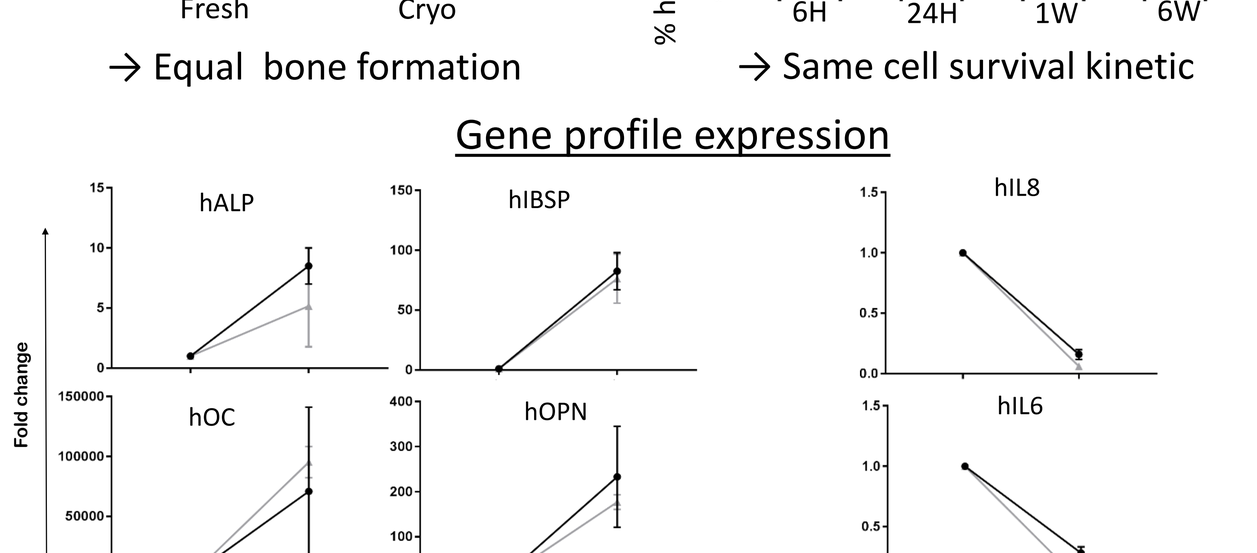
Gene profile expression

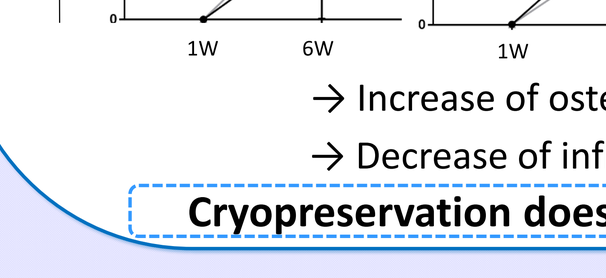
→ chemo-attraction of host endothelial cells
→ same level of immune cells

Cryopreserved MSCs kept the same vasculogenesis potential

Bone formation ?

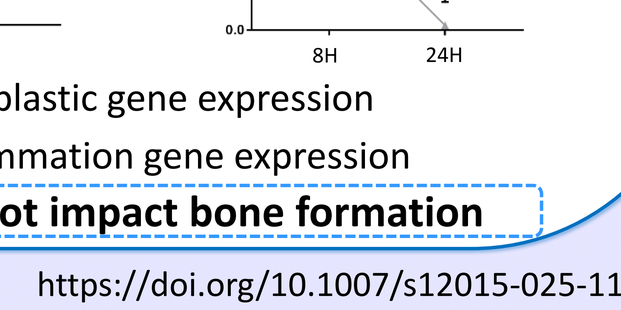
Histology





→ Equal bone formation

Cell survival *in vivo*



→ Same cell survival kinetic

Gene profile expression

→ Increase of osteoblastic gene expression
→ Decrease of inflammation gene expression

Cryopreservation does not impact bone formation

Conclusion

In vitro and *in vivo* results demonstrated no difference between freshly cultured and thawed BM-MSCs

→ No more logistic limitations

This new protocol should be considered for future bone tissue engineering protocols

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