Exploration of Shipping Conditions to Retain Viable Recovery for Umbilical Tissue

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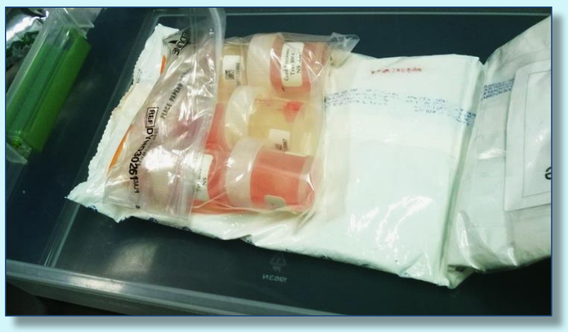
Goals of Collection and Processing

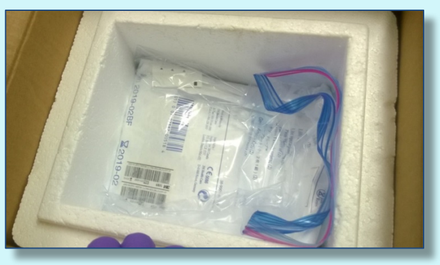
- Get autologous birth tissue that can generate mesenchymal stem cells (MSC) in culture
- Identify a shipping method that allows tissue to arrive in the processing lab in a viable state
- Find methods to control microbial contamination in outgrowth
- Select appropriate cryopreservation reagents and methods
- Deliver to clinical study facilities tissue that is viable and appropriate for further processing



Microbial control and viability maintenance

Methods

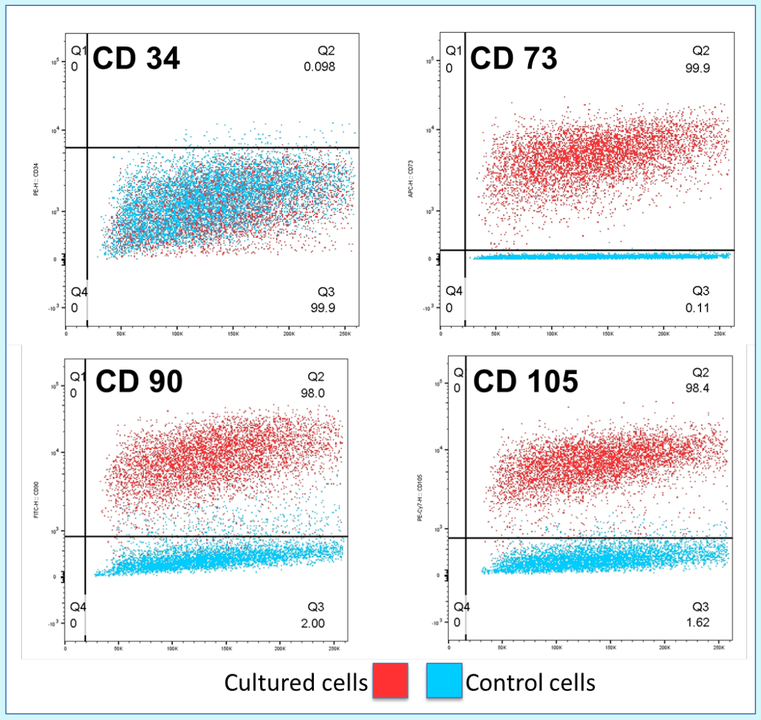
- 3 tissue treatments – dissected, Wharton's Jelly placed on 32 box grid plates on 0.1% gelatin in enriched medium for MSC culture
- 6 collections, 3 conditions before and after freezing
- Growth grade = number of squares with outgrowth / total tissue section squares
- Cryopreservation
  - Cryostor10 soak for 1 hr at 4C, step rate freezing
  - Stored in LN_2, vapor phase



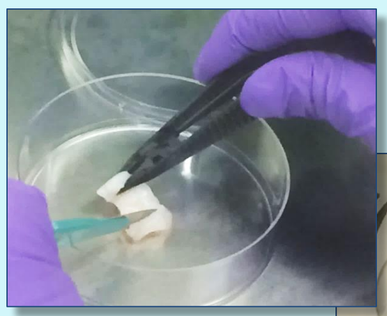
Environmental control

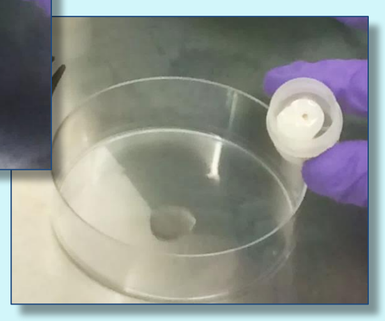
Results

Tissue Collection Condition	Average % with growth – Fresh	Post thaw	Flow Cytometry CD34	CD73 CD90 CD105
NS	48	31.6	Neg	positive
NS+AB	34.6	13.8	Neg	positive
Dry (soaked in AB 24 h)	46.4	17.4	Neg	positive



All 36 samples gave outgrowth before and after freezing

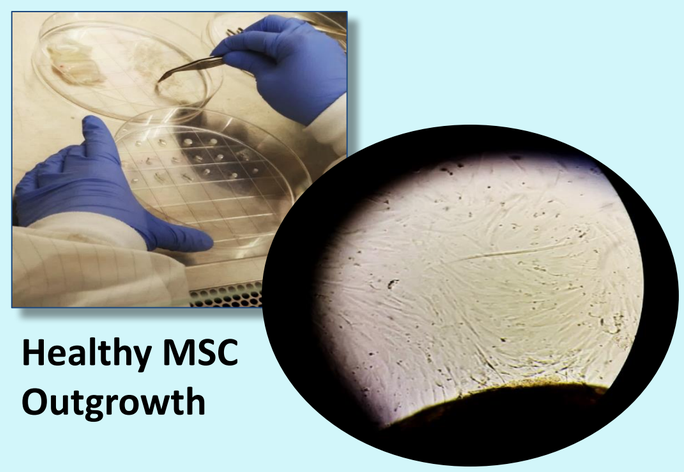




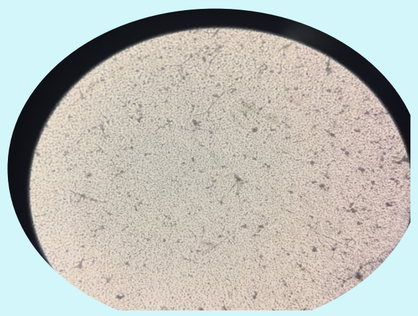
Cryopreservation preparation

Conclusions

- Kit instructions and environmental control yielded viable tissue samples
- All three tissue shipping container conditions were successful for MSC outgrowth confirmed by CD markers
- Further study is needed to optimize tissue handling to obtain microbial control and tissue outgrowth yield



Healthy MSC Outgrowth



Contaminated Outgrowth (1 NS sample)

Next Steps

Some contamination control is necessary, but how much?

- Soak in NS + AB for 24 hours works for contamination control but hurts viability
- Shorter soak times will be tried for microbial control and tissue viability to maximize both