HELIOS® UltraGRO™-PURE

Xeno-free Cell Culture Supplement

Rapid, Consistent, Cost-Effective Cell Culture !

Optimize Your Mesenchymal Stem Cells Culture

AventaCell Biomedical's **UltraGRO™-PURE**, one of their Helios BioScience line of products, was developed to be a xeno-free cell culture supplement rich in growth factors and cytokines, as an alternative to FBS, to optimize your in-vitro culture of primary human cells, including MSCs. **UltraGRO™-PURE** is manufactured from human platelets collected from healthy donors by FDA licensed blood centers to provide you with a safe, consistent, and high performance cell culture supplement.

Benefits of UltraGRO™-PURE

- Animal component-free / Serum substitute
- Replace up to 20% FBS with 5% UltraGRO™-PURE
- Better performance in primary isolation and expansion cultures
- Shorten population doubling times (20~30 hrs)
- Cost-effective choice for low cost per million cells produced
- No adhesion factors needed
- Lot to lot consistency
- No heparin required

Shorter Doubling Time and Higher Proliferation Capacity for hMSCs

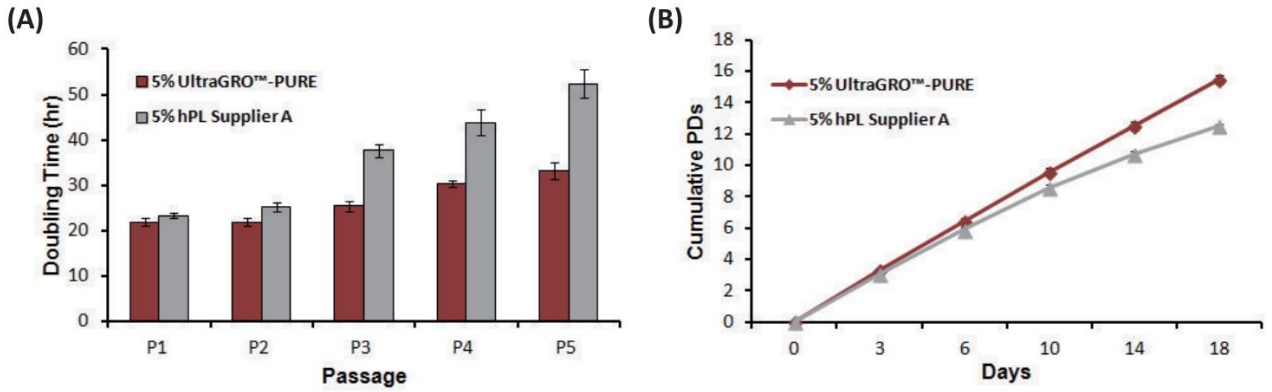

Fig. 1: Performance of UltraGRO™-PURE for human MSCs growth. (A) Doubling time and (B) cumulative population doublings of UltraGRO™-PURE cultured human bone marrow-derived mesenchymal stem cells(hBM-MSCs) were compared to human platelet lysates supplier A. Concentration of both media supplements vs basal medium was 5%. (N=3)

Ordering Information

Product Number	Product	Bottle Size (mL)
HPCHXCRL05	UltraGRO™-PURE Research	50
HPCHXCRL10		100
HPCHXCRL50		500
HPCHXCGL05	UltraGRO™-PURE GMP	50
HPCHXCGL10		100
HPCHXCGL50		500

AventaCell BioMedical Corp

Manufacturing Site:
8727 S 212th Street, Kent, WA 98031, USA

Website: **www.atcbiomed.com**
Contact: **sales@atcbiomed.com**

*AventaCell Internal Data 2014-2018

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Maintain Multi-lineage Differentiation Potential

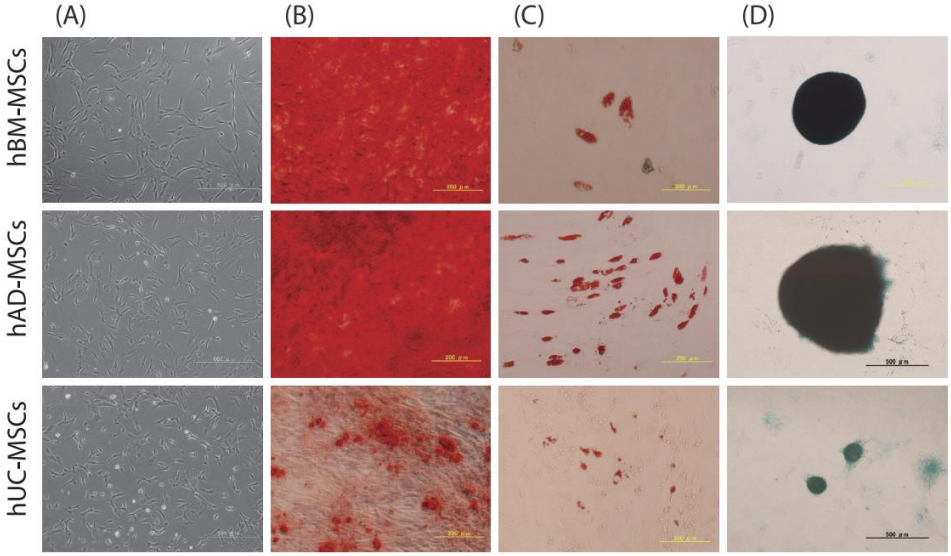

Fig. 2: Characterization of human MSCs from bone marrow (BM), adipose tissue (AD), and umbilical cord (UC) cultured in UltraGRO™-PURE. (A) Cell morphology exhibited spindle-shaped morphology in Passage 5. 100x magnification. (B) The human MSCs can subsequently differentiate into osteogenic cells (Alizarin red staining), 200x magnification; (C) adipocytes (Oil Red O staining), 200x magnification; (D) chondrocytes (Alcian Blue staining), 100x magnification.

Replace 20% FBS with 5% UltraGRO™-PURE

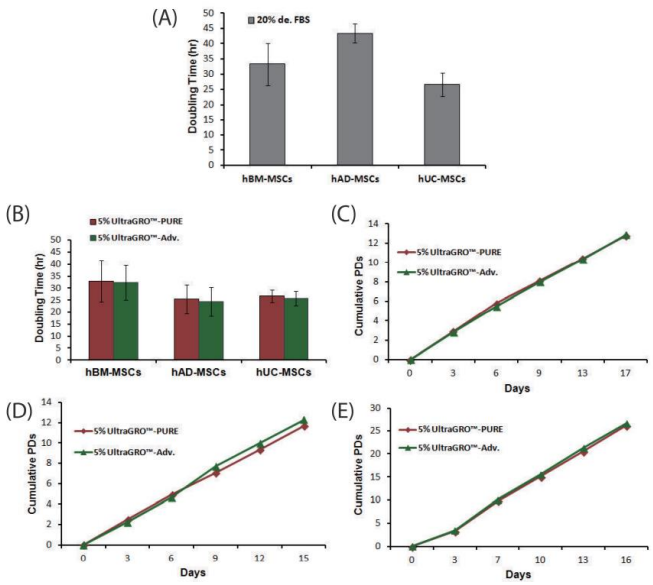

Fig. 3: Performance of UltraGRO™-PURE for human MSCs from bone marrow (BM), adipose tissue (AD), and umbilical cord (UC) growth. (A) Mean doubling time of 20% defined FBS cultured or (B) UltraGRO™-PURE cultured human MSCs for 5 passages. (C) Cumulative population doublings of UltraGRO™-PURE cultured hBM-MSCs, (D) hAD-MSCs, and (E) hUC-MSCs were comparable to UltraGRO™-Adv, as a reference of fibrinogen-depleted hPL product. (N=3)

Maintain Cell Surface Phenotype

Cell Type	Supplement	CD105	CD90	CD73	CD44	CD29	CD13	CD45	CD34	HLA-DR
hBM-MSCs	UltraGRO™-Advanced	99.37%	99.97%	99.8%	99.86%	99.97%	99.88%	0.68%	1.24%	1.42%
	UltraGRO™-PURE	99.82%	99.97%	99.89%	99.82%	99.99%	99.97%	2.77%	0.56%	0.4%
hAD-MSCs	UltraGRO™-Advanced	99.51%	100%	99.64%	99.98%	100%	99.95%	1.41%	0.08%	0.15%
	UltraGRO™-PURE	99.14%	99.98%	99.63%	99.9%	99.98%	99.87%	1.04%	1.21%	0.6%
hUC-MSCs	UltraGRO™-Advanced	98.03%	99.96%	99.67%	99.79%	99.96%	99.71%	0.62%	0.7%	0.52%
	UltraGRO™-PURE	99.64%	100%	99.68%	99.71%	100%	99.97%	1.31%	1.64%	1.66%

Fig. 4: Human BM-, AD-, and UC-MSCs cultured in UltraGRO™-PURE for 5 passages displayed characteristic expression of MSC surface markers. UltraGRO™-Adv. is used as a reference of fibrinogen deletion hPL product.

AventaCell BioMedical's products are manufactured under a GMP compliant Qualified Management System. Unless otherwise indicated, products are provided for in vitro use only, not for animal, therapeutic, or diagnostic use.

Your regulatory authority will provide guidance on the requirements for ancillary materials for cell therapy development applications. Depending on the requirements, AventaCell BioMedical may be able to work with you in meeting your regulatory and quality needs.

If you have any questions or would like to discuss the potential use of a product for your application please contact us.

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