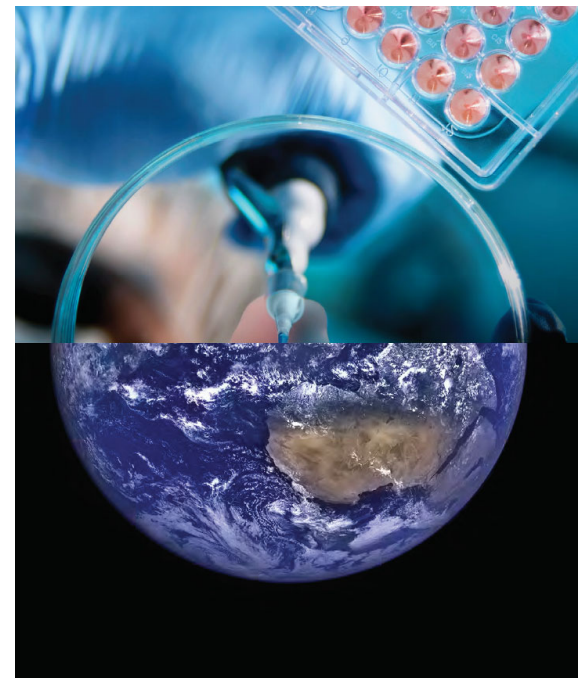
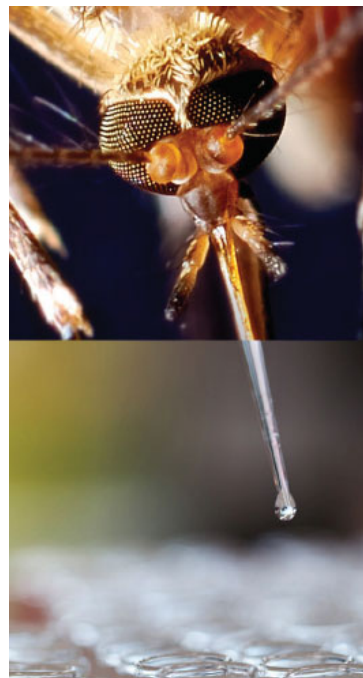
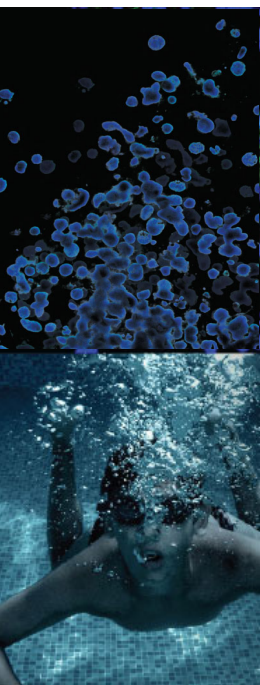




iPSC-derived primary cells: Expand your cell-based assays with an unlimited, biologically relevant source

Yalin Firinci, M.B.A.
Product Line Business Specialist, ATCC

Credible Leads to Incredible™



ATCC today

- Founded in 1925, ATCC is a non-profit organization with HQ in Manassas, VA and an R&D & Services center in Gaithersburg, MD
- World wide brand name and quality recognition
- World's premiere biological materials resource and standards development organization
 - 4,000 cell lines
 - 70,000 microbes
- ATCC collaborates with and supports the scientific community with industry-standard and innovative biological solutions
 - Growing portfolio of products and services
 - Sales and distribution in 140 countries, 12 International distributors
- Talented team of 475+ employees; > one third with advanced degrees
- Multiple accreditations including ISO 9001 and ISO 13485



Established
partner to
global
researchers



Agenda

- iPSC-derived Primary Cells Background
- iPSC-derived Primary Cells Portfolio
 - iPSC-derived Mesenchymal Stem Cells (ATCC® ACS-7010™)
 - iPSC-derived CD34+ Cells (ATCC® ACS-7020™)
 - iPSC-derived Monocytes (ATCC® ACS-7030™)
- Summary

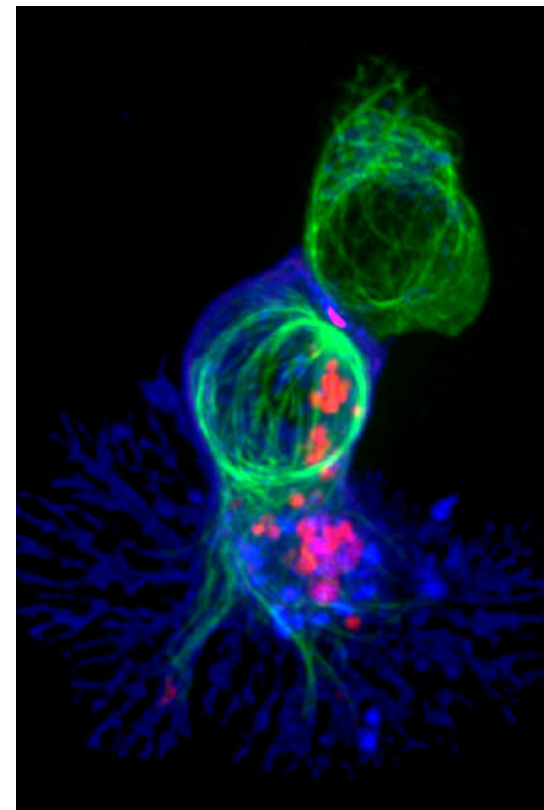
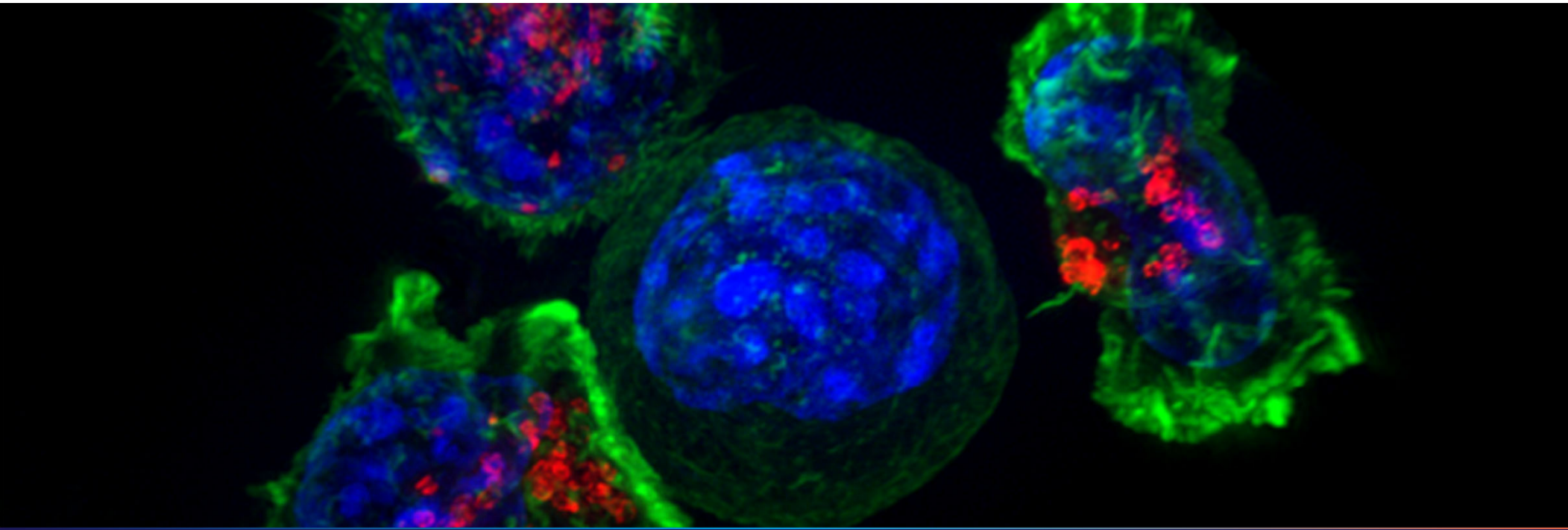


Image courtesy of Alex Ritter, Jennifer Lippincott Schwartz, and Gillian Griffiths, National Institutes of Health



iPSC-derived Primary Cells Background Information

Image courtesy of Alex Ritter, Jennifer Lippincott Schwartz,
and Gillian Griffiths, National Institutes of Health

What are iPSCs?

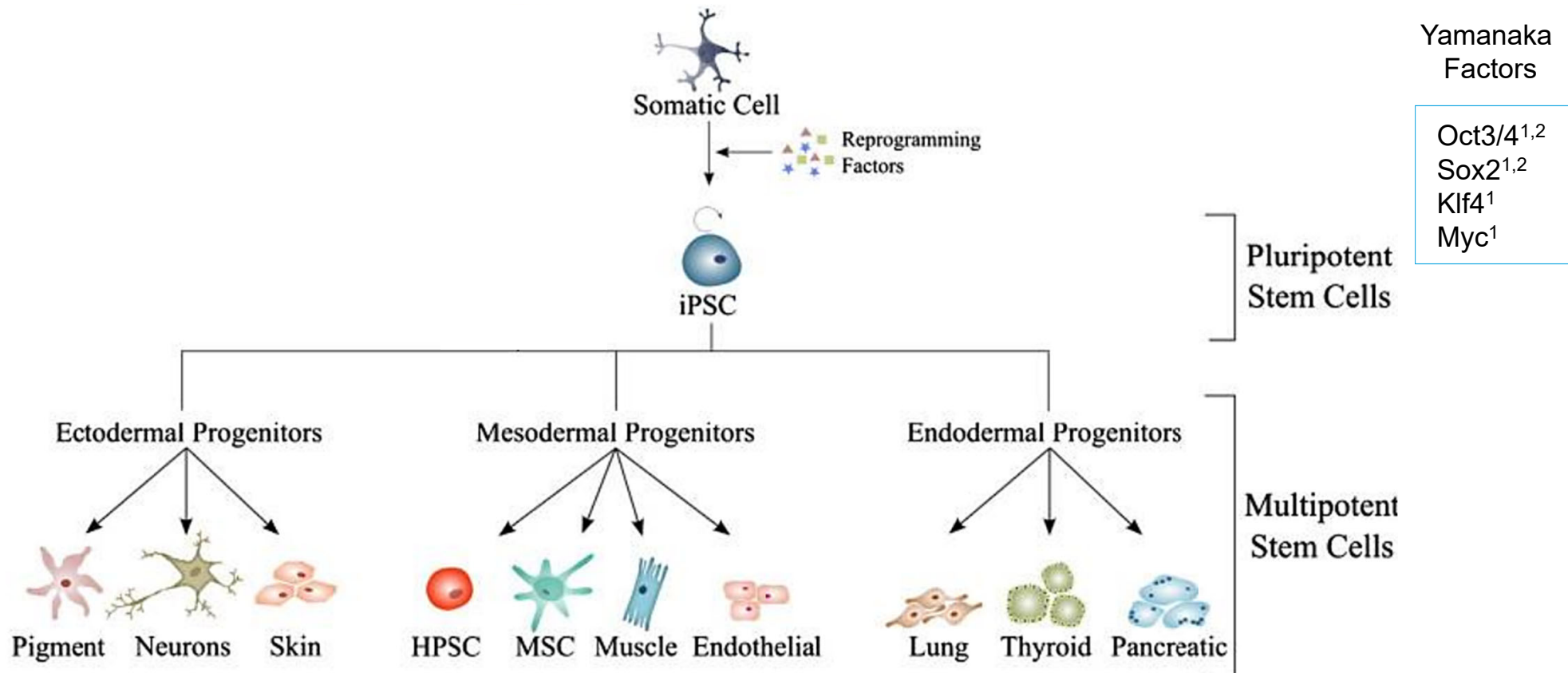
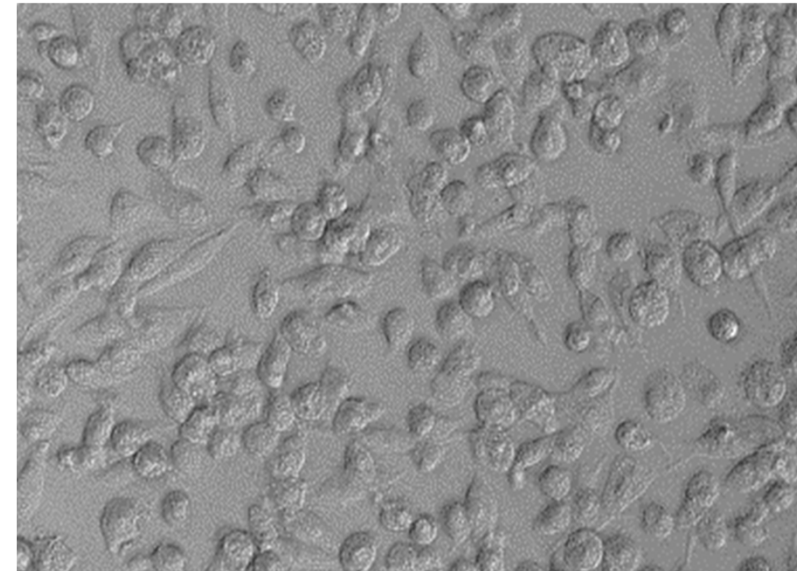


Figure adapted from Kaebisch C, et al., 2015.

1. Takahashi K. et al., 2006.
2. Yu J. et al., 2007.

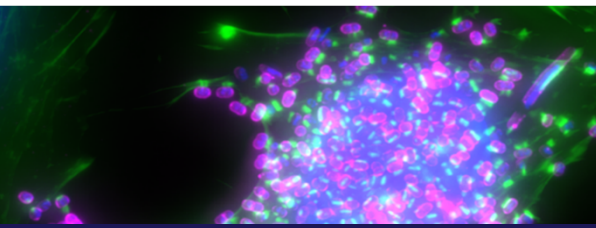
iPCS-derived Primary Cells

- ATCC iPSCs were used as feedstock for this project
- The iPSCs were terminally differentiated to the desired cell type by incubation in proprietary media formulations
- An unlimited, clonal source of cells needed for research or therapeutic purposes was developed using this method
- **Scope:** ATCC iPSCs were the source for three types of differentiated cells:
 - Mesenchymal Stem Cells (MSCs)
 - CD34+ Progenitors
 - Monocytes.

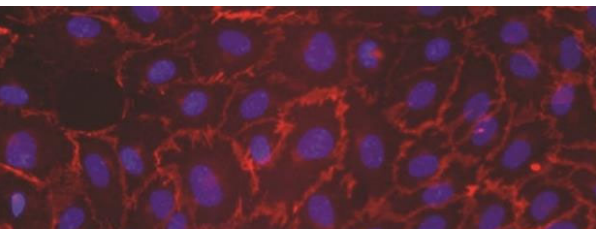


Macrophages differentiated from
iPSC-derived Monocytes

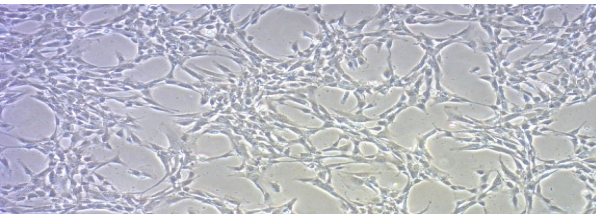
ATCC classic and advanced cell models



Continuous cell line: HeLa (ATCC® CCL-2™)



Primary: Umbilical Endothelial Cells
(ATCC® PCS-100-010™)



iPSC-derived Mesenchymal Stem Cells
(ATCC® ACS-7010™)

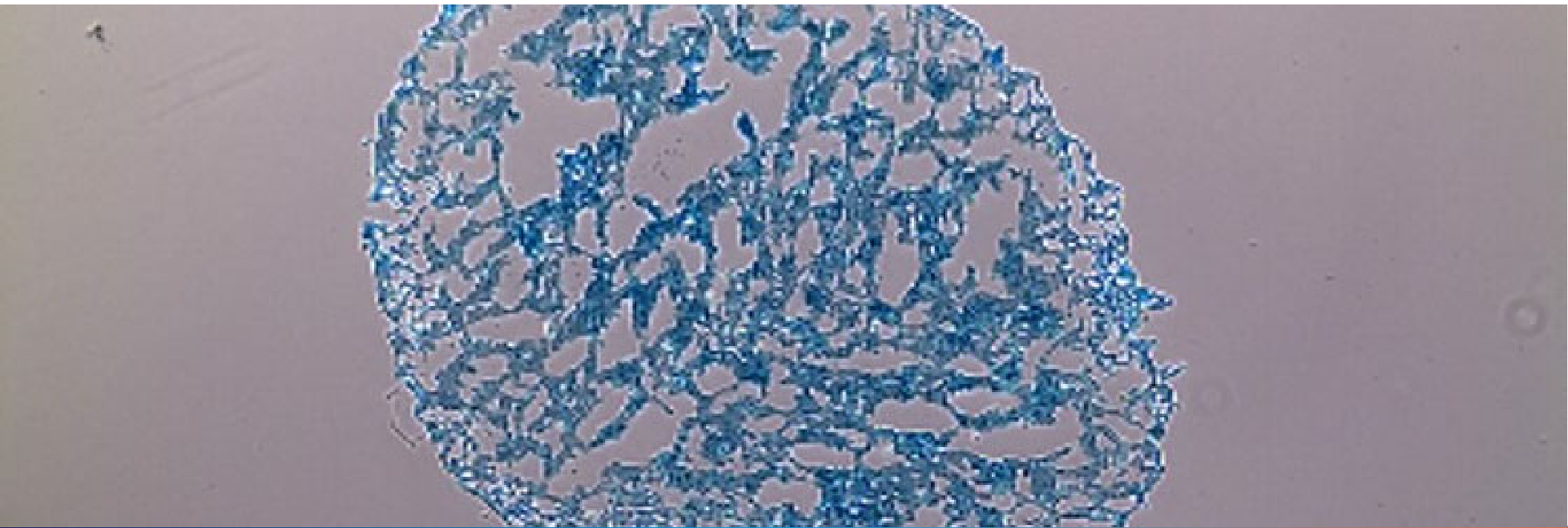
- ATCC is a complete solution supplier
- From basic research through discovery and development to product testing
 - Continuous cell lines
 - Primary cells
 - hTERT immortalized primary cells
 - iPSC-derived primary cells
- Portfolio features
 - Reliability
 - Fully characterized cells
 - Optimized growth protocols

Pros and cons of different cell models

	Primary Cells	hTERT Immortalized	Continuous Cell Lines	iPSC-derived
Mimic <i>in vivo</i> tissue type	++++	+++	+	+++
Genotypic stability	Diploid	Diploid/ Near Diploid	Aneuploid	Diploid
Proliferative capacity	+	+++	+++	+
Supply	+	+++	+++	+++
Inter-experimental reproducibility	+	+++	+++	+++
Cost	+++	+++	+	++
Ease-of-use	+	++	+++	++
Predictability in toxicological studies	+++	+++	+	+++

ATCC Portfolio

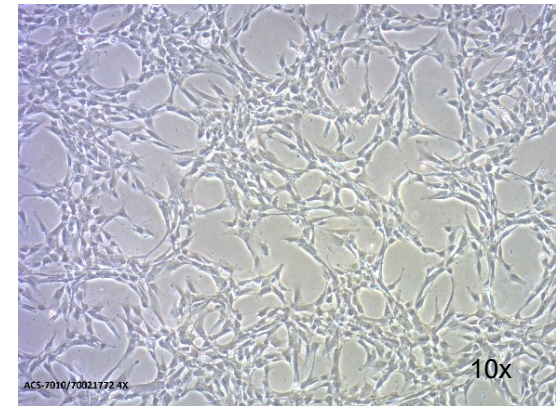
Cell Type	ATCC® No.	Product Type	Tissue of Origin/ Parental Line (ATCC® No.)
Mesenchymal Stem Cells	PCS-500-011™	Primary	Adipose
	SCRC-4000™	hTERT immortalized	Adipose
	ACS-7010™	iPSC derived	Bone marrow BYS0112 (ACS-1026™)
CD34+ Progenitor Cells	PCS-800-012™	Primary	Bone Marrow
	ACS-7020™	iPSC derived	Bone marrow – CD34+ BXS0117 (ACS-1031™)
Monocytes	PCS-800-011™	Primary	Peripheral Blood
	ACS-7030™	iPSC-derived	Foreskin fibroblast DYS0100 (ACS-1019™)



ATCC's iPSC-derived Cells Portfolio

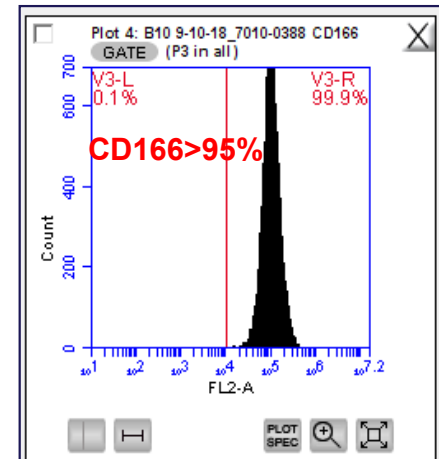
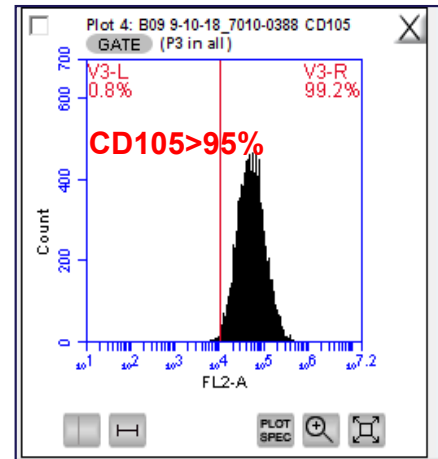
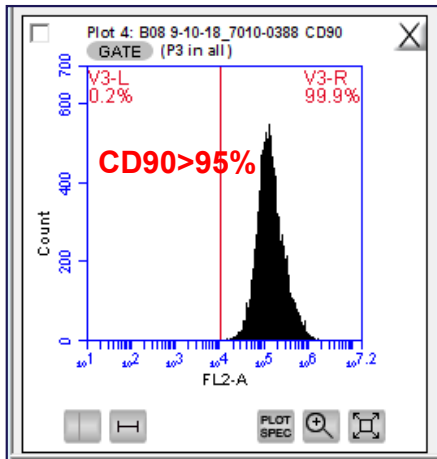
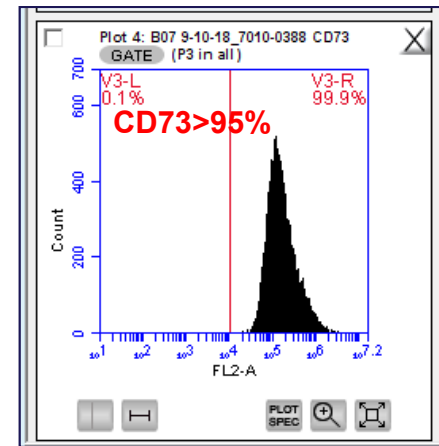
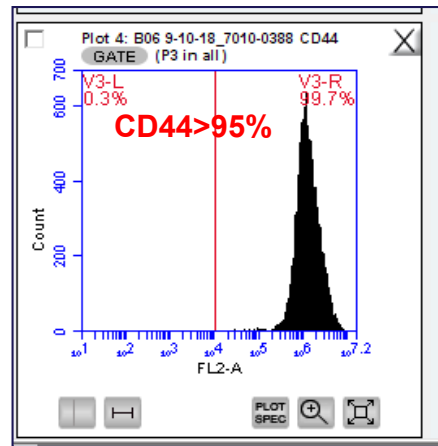
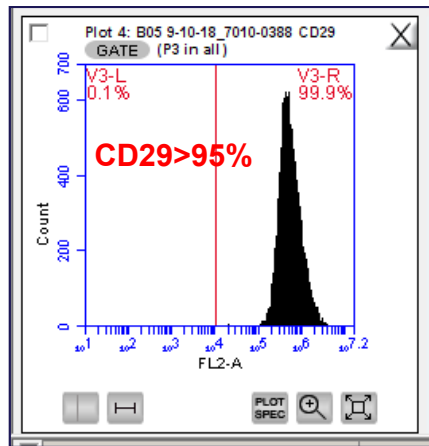
iPSC-derived Mesenchymal Stem Cells (ATCC® ACS-7010™)

- High purity
 - CD29 ,CD44,CD73, CD90, CD105, and CD166>95%;
 - CD14, CD19, CD31, CD34, and CD45 <5%.
 - Tra-I-60⁺ < 5%
- High post-thaw viability (>90%)
- Available in large quantity from a single source
- High osteocyte, adipocyte and chondrocyte differentiation potential
- Serum free freezing medium



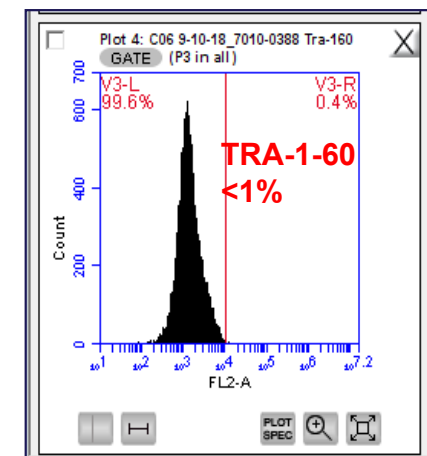
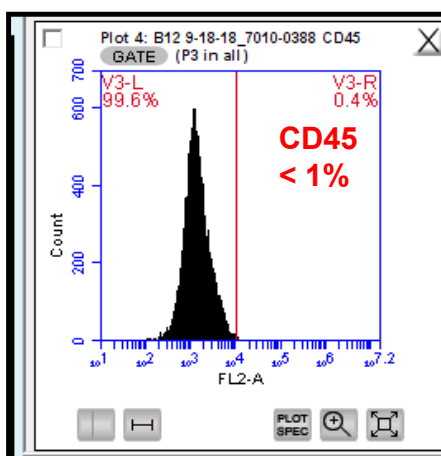
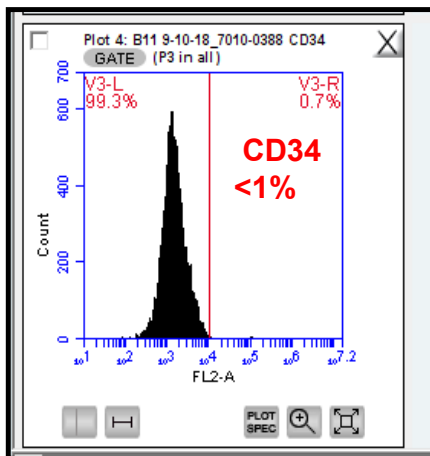
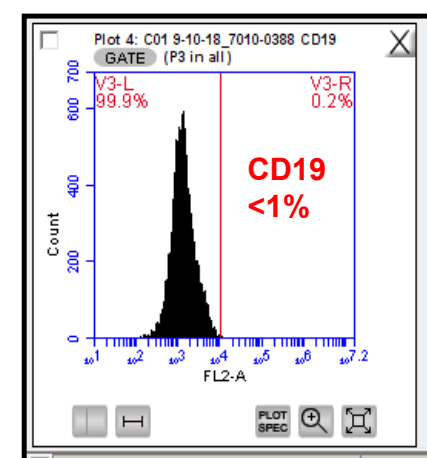
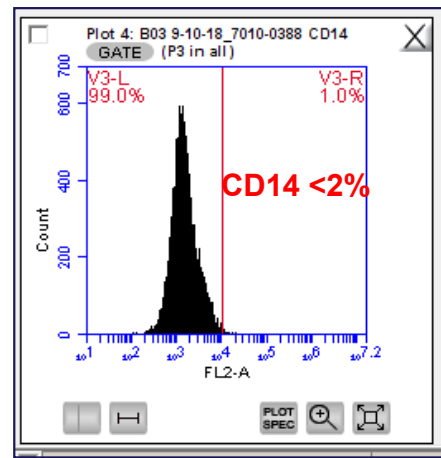
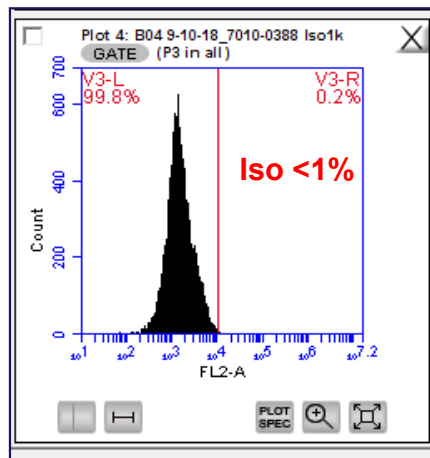
Flow cytometry of surface markers of iPSC-derived MSC

Positive marker expression

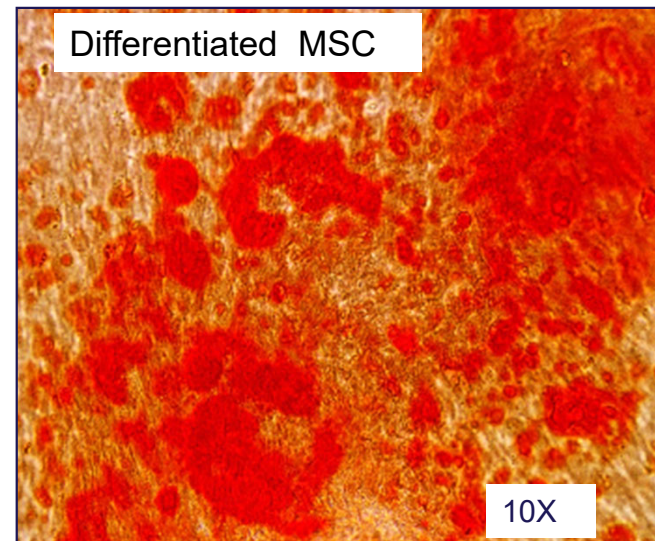
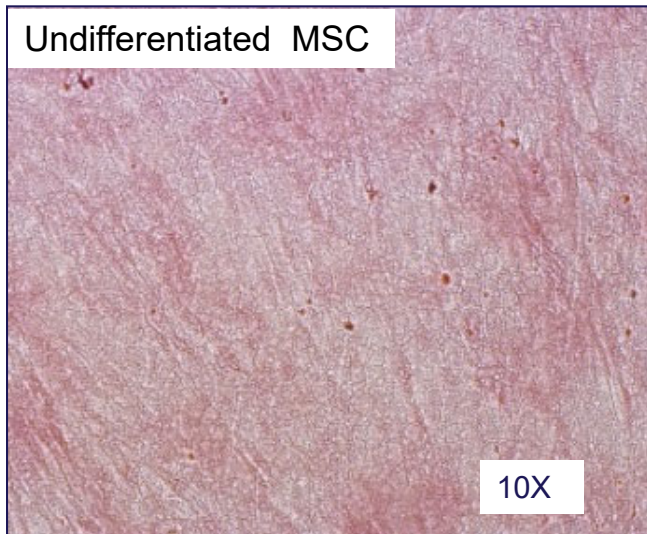


Flow cytometry of surface markers of iPSC-derived MSC

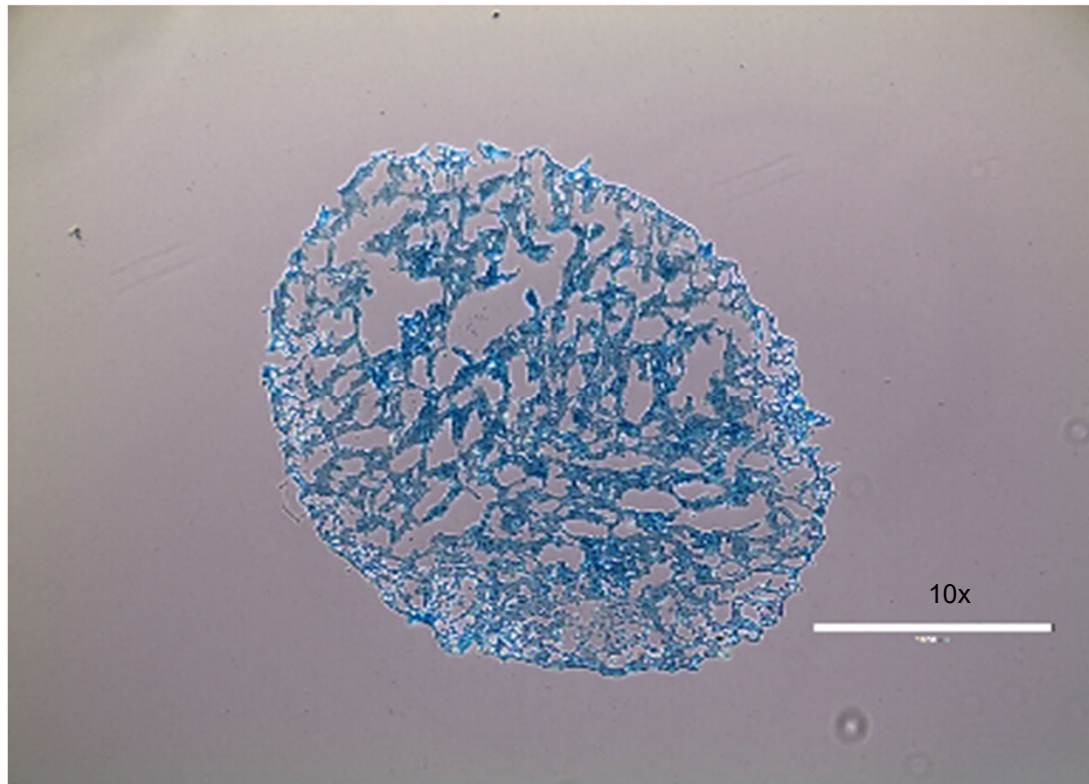
Negative marker expression



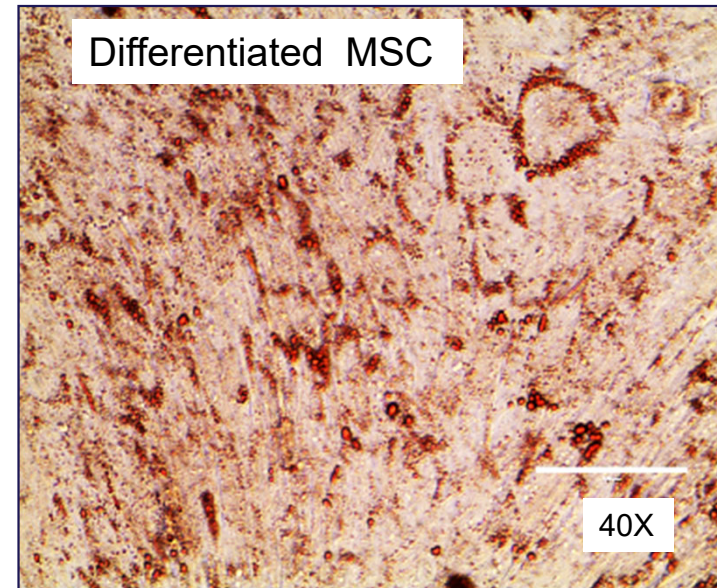
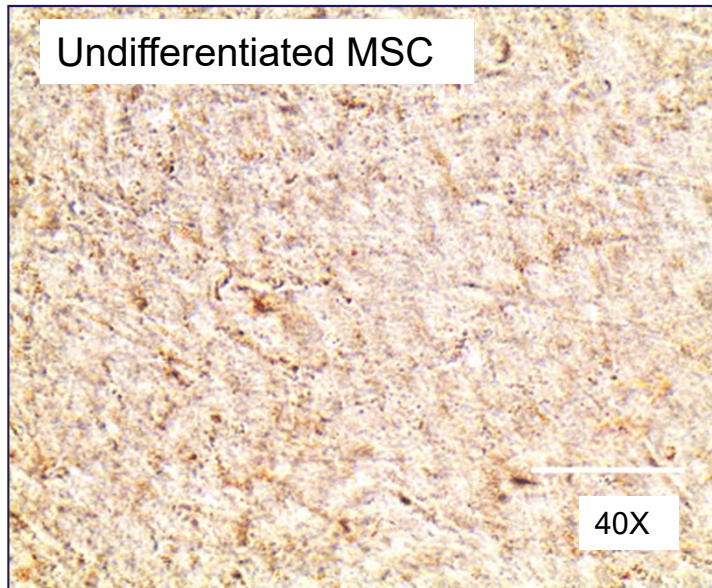
Osteocyte differentiation potential



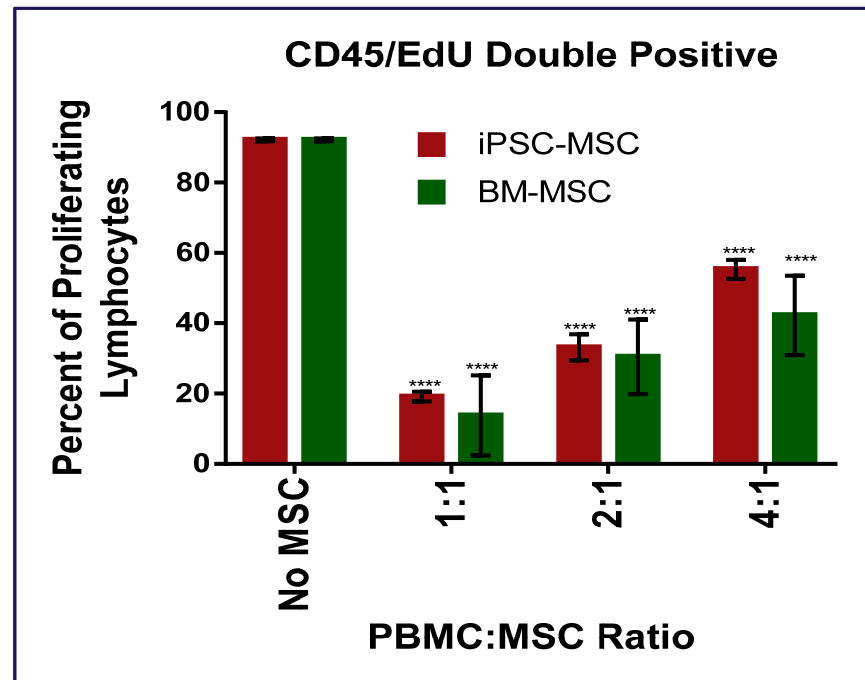
Chondrocyte differentiation potential



Adipocyte differentiation potential

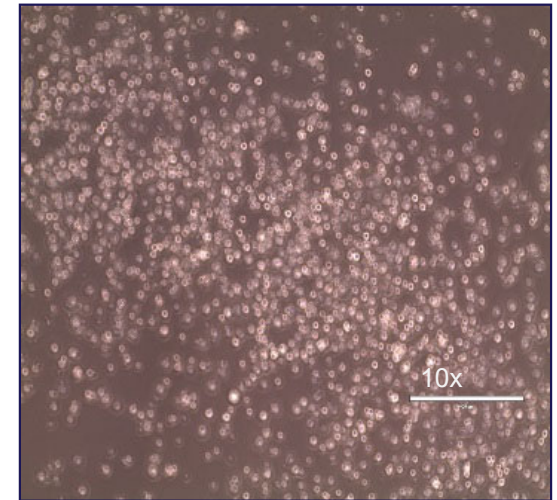


iPSC-derived MSCs immunosuppress activated PBMCs

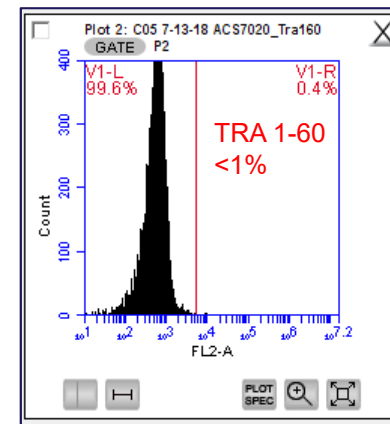
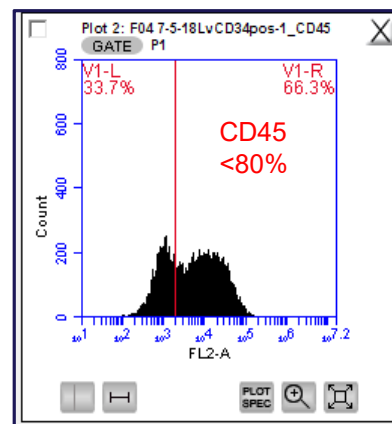
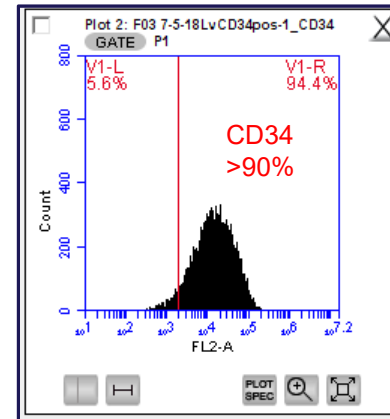
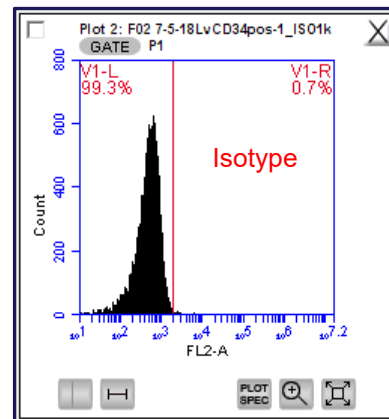


iPSC-derived CD34⁺ progenitor cells (ATCC® ACS-7020™)

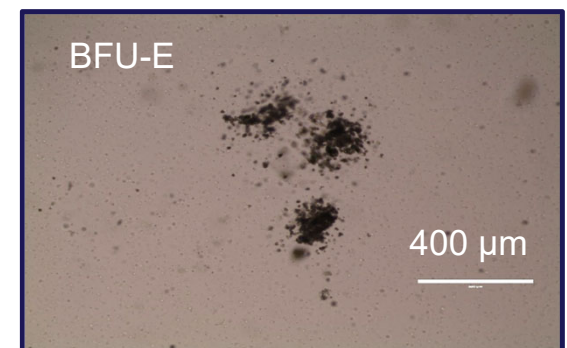
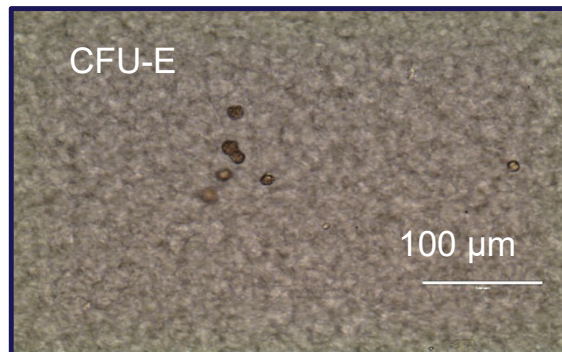
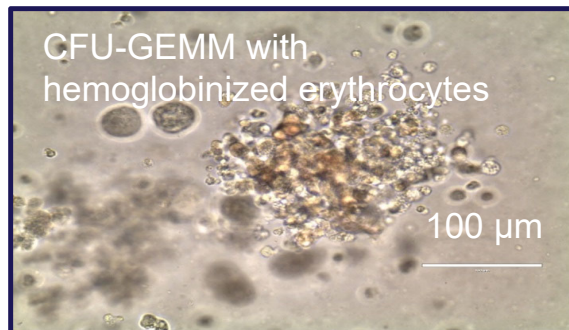
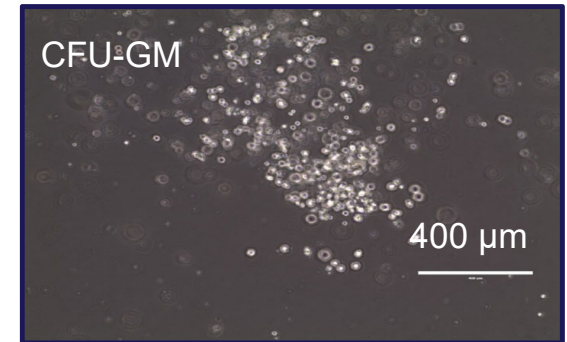
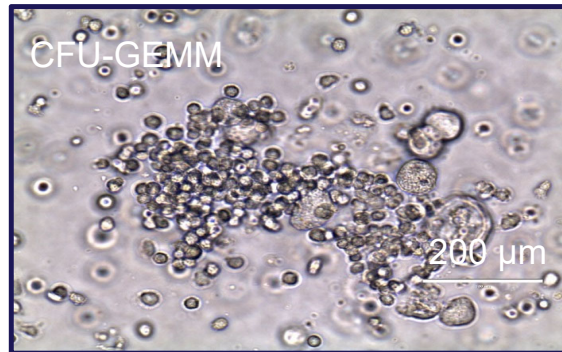
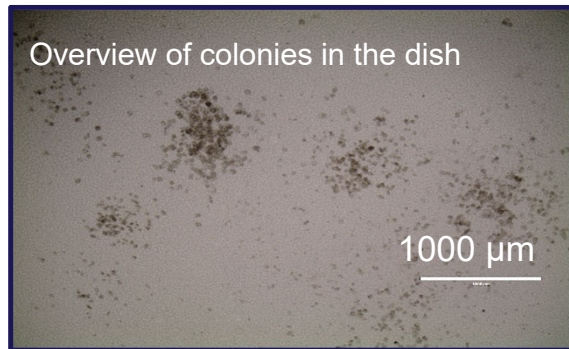
- High purity
 - CD34⁺ >90%
 - CD45⁺ < 80%
 - Tra-I-60⁺ < 5%
- High post-thaw viability (>92%)
- Suspension cells
- Available in large quantity from a single source
- High erythroid, myeloid, and megakaryocyte differentiation potential
- Serum free freezing medium



Marker analysis in iPSC-derived CD34⁺ cells

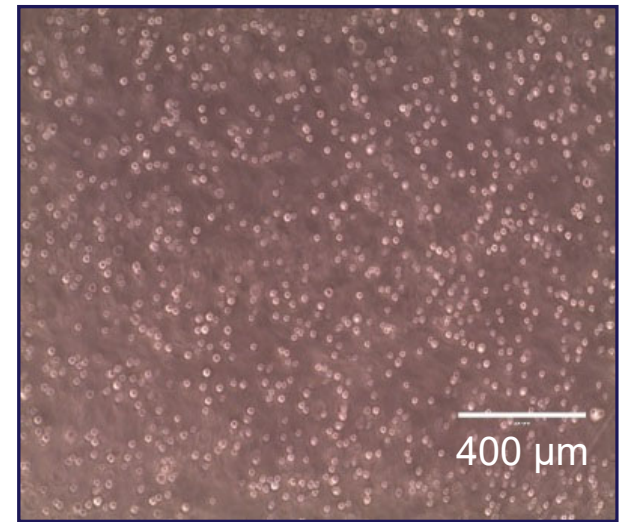


Blood lineage differentiation potential

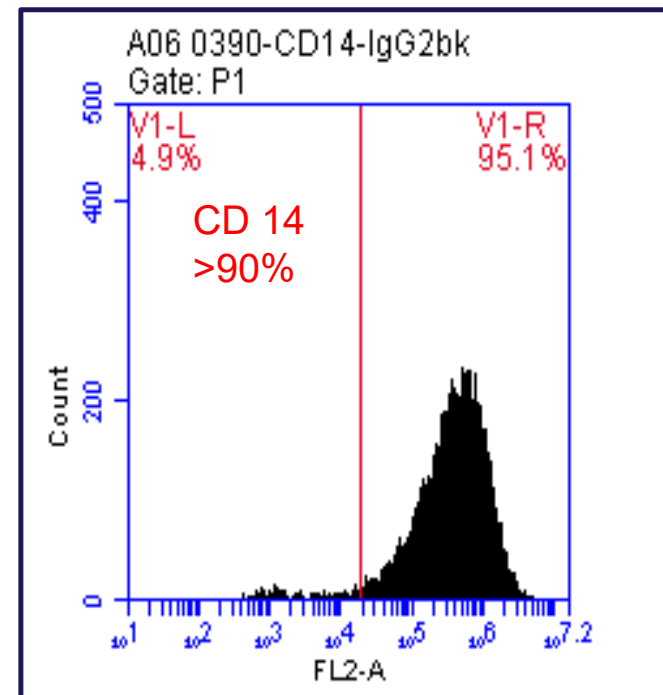
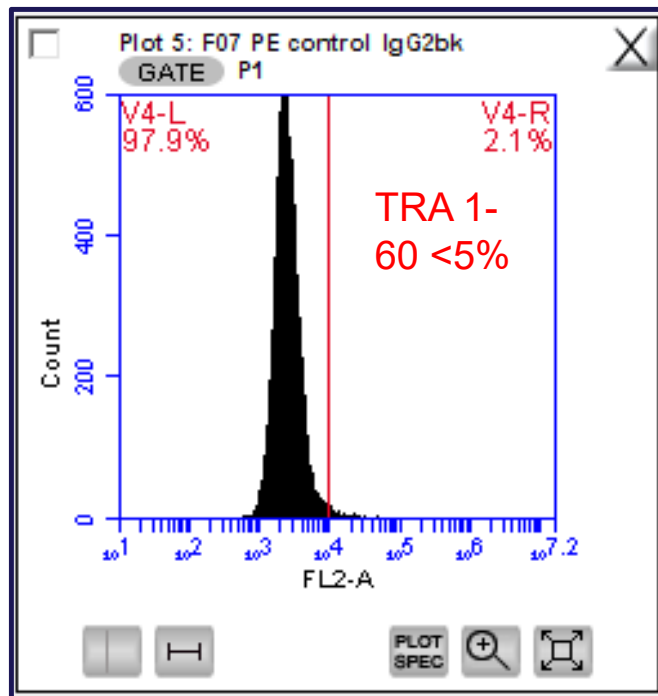


iPSC-derived Monocytes (ATCC® ACS-7030™)

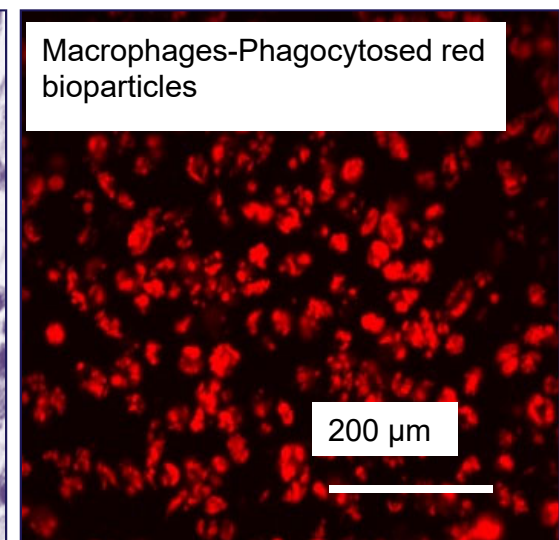
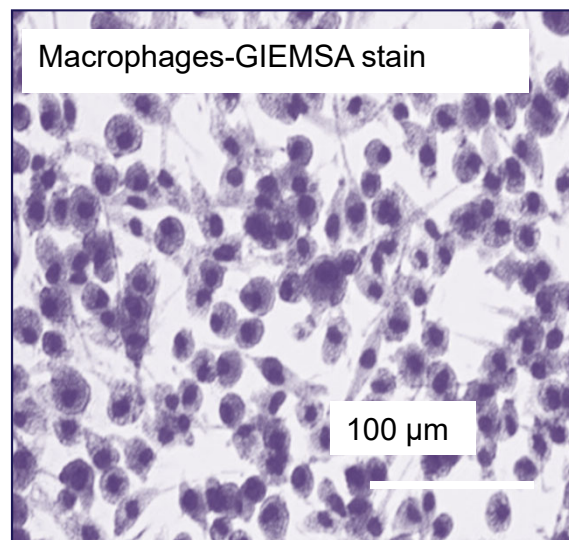
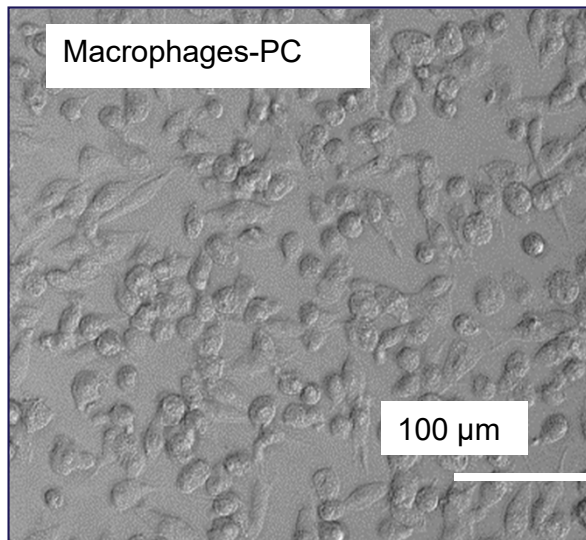
- High purity
 - CD14+ > 90%
 - Tra-I-60+ < 5%
- High post-thaw viability (>95%)
- Suspension cells
- Available in large quantity from a single source
- High macrophage and dendritic cell differentiation potential
- High cytokine activation
- High phagocytic potential for macrophages
- Serum free freezing medium



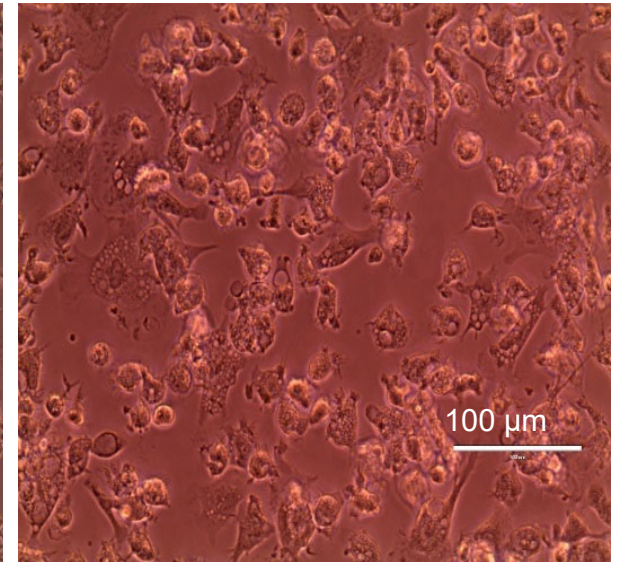
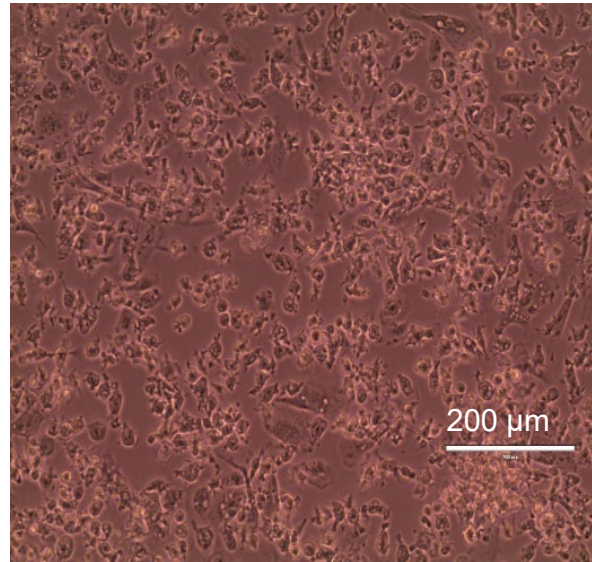
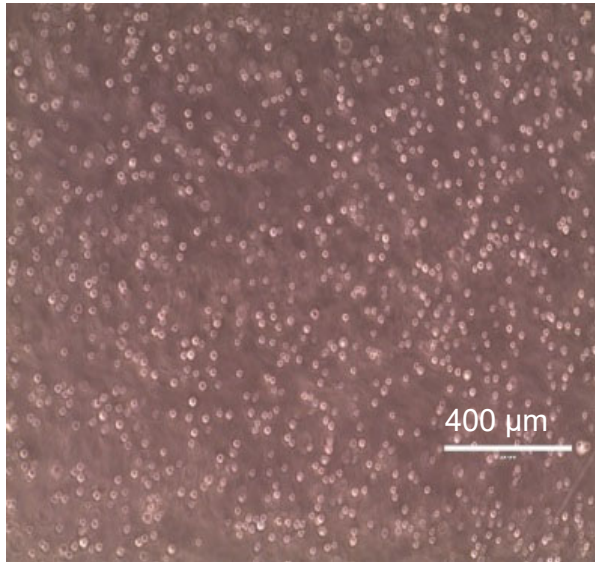
Marker analysis of iPSC-derived Monocytes



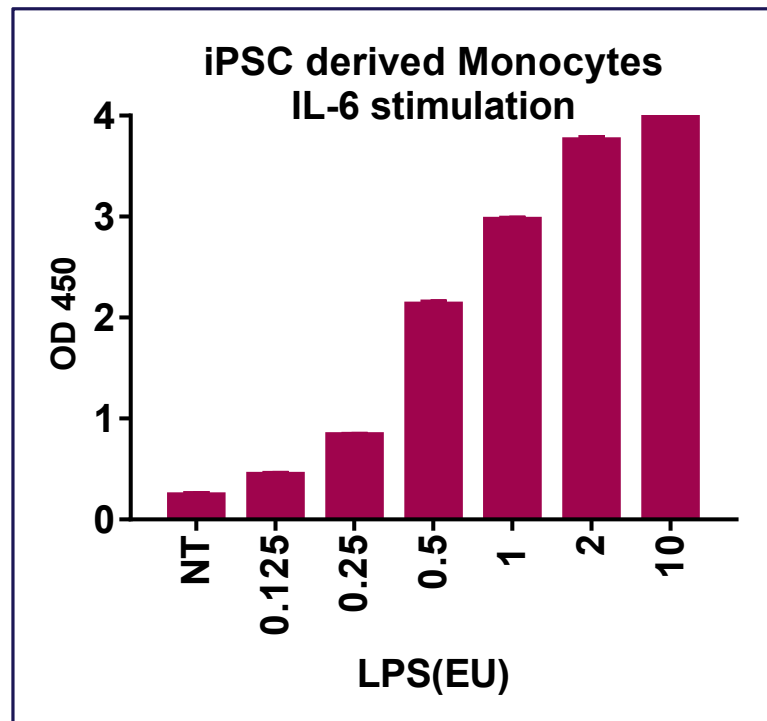
Macrophage differentiation potential



Dendritic cell differentiation potential

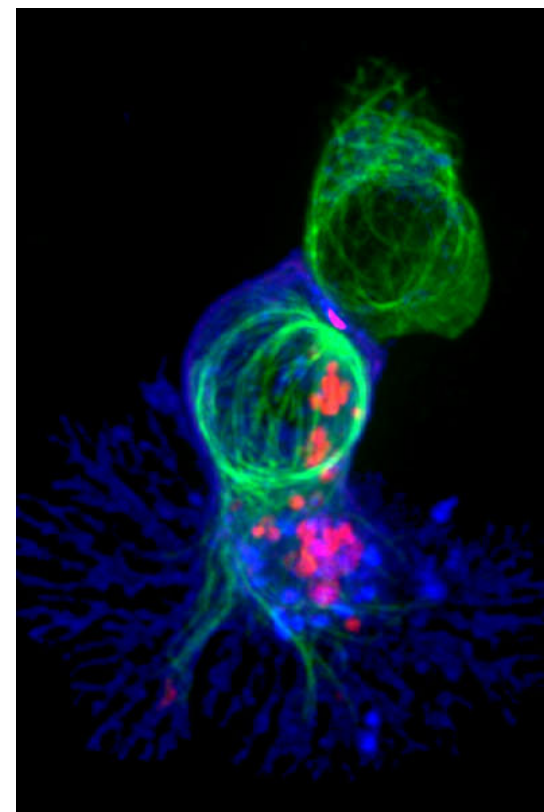


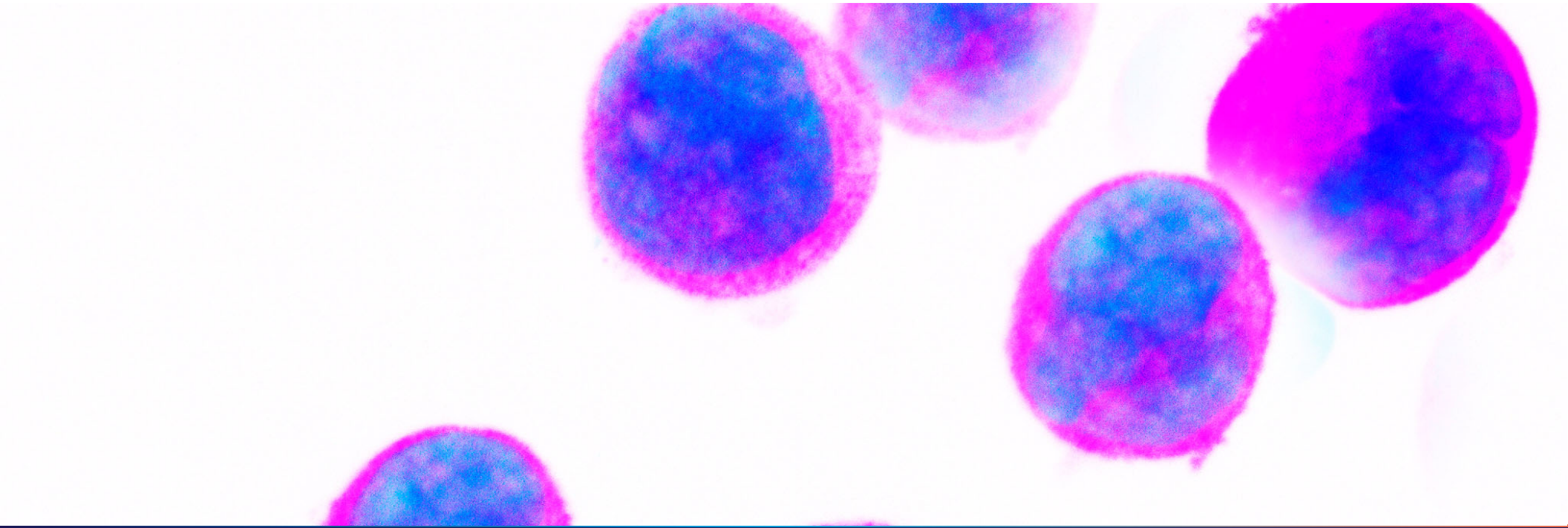
Monocyte activation assays



Summary

- ATCC developed proprietary methods for the differentiation of CD34+ cells, Monocytes, and MSCs from normal human iPSCs
- Different ATCC iPSC lines have varied efficiencies for differentiation into distinct lineages
- Differentiated iPSC-derived primary cells provide:
 - An unlimited source of cells
 - Interexperimental reproducibility
 - High biological relevance – They exhibit primary cell functionality and genetic stability
- iPSC-derived CD34+ cells can differentiate to all blood lineage cells
- iPSC-derived Monocytes can differentiate to functionally active macrophages and dendritic cells
 - Activated cells can be utilized for developing a MAT assay
- iPSC-derived MSCs can:
 - Differentiate to osteocytes, adipocytes, and chondrocytes
 - Display immunosuppressive properties
- You can order these products at www.atcc.org/differentiatediPSCs





Thank You

Questions?

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Thank you for joining today!

- Register for more ATCC webinars at www.atcc.org/webinars
- Go to www.atcc.org/differentiatediPSCs
- Poster Presentation: ISSCR 2019
Production of assay-ready iPSC-derived CD34+ cells, monocytes, and mesenchymal stem cells

Presented by Sheela Jacob, Ph.D.
June 28 | 7:00 PM ET
Poster Board # F-2052

