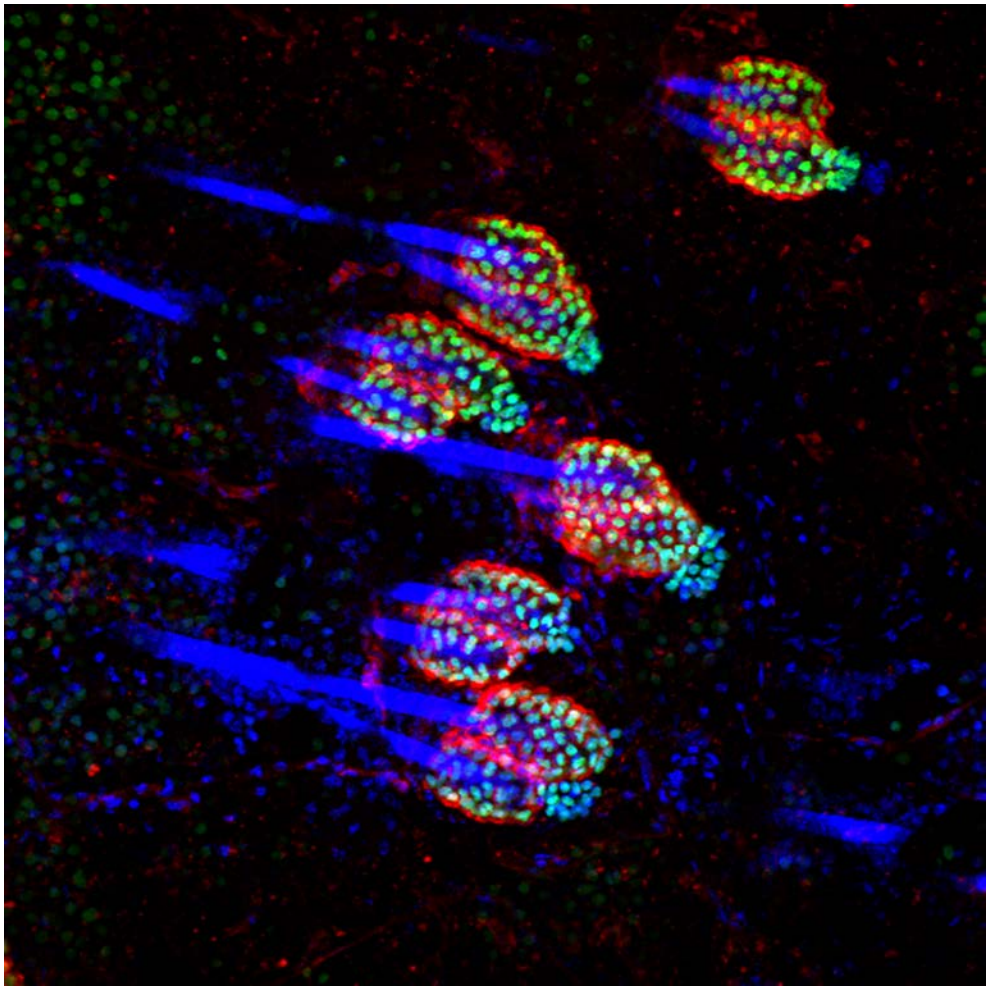
NYSTEM 2012 Calendar

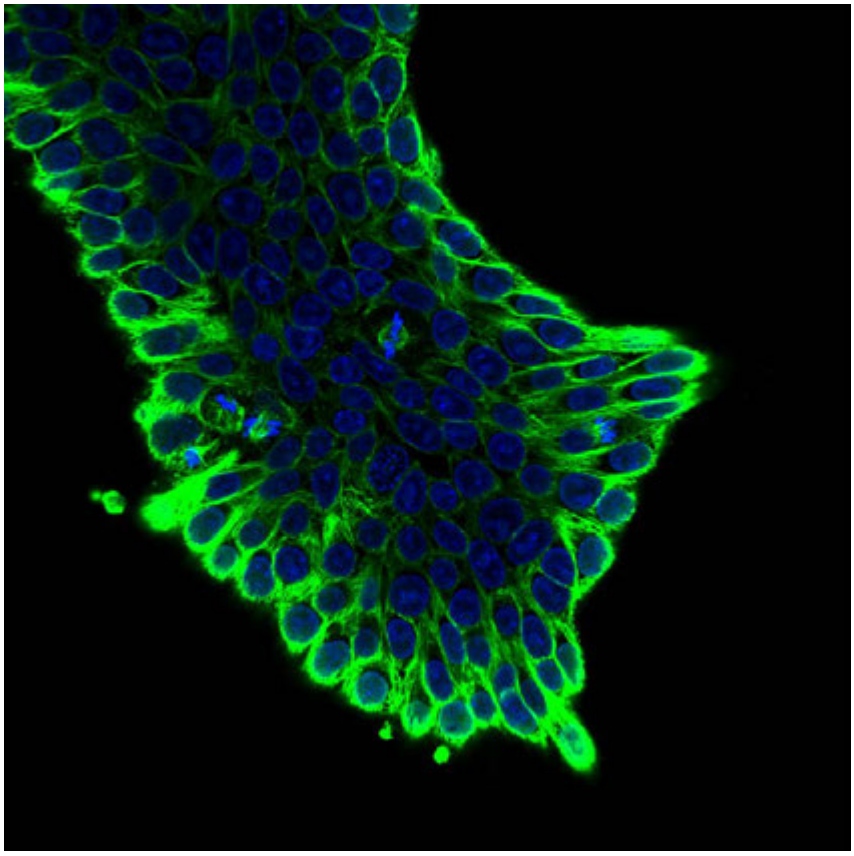


Hair Follicle Stem Cells

Source: Ting Chen and Elaine Fuchs, The Rockefeller University, New York, NY

NYSTEM
NEW YORK STATE
STEM CELL SCIENCE

NEW YORK
state department of
HEALTH



Cytoskeleton Staining of H9 Cells

Chromatin is visualized by Hoechst. The microtubule cytoskeleton is stained with anti-α-tubulin antibody and shown in green. Several cells undergoing mitotic division of chromosomes are present in this field.

Source: Martin Tomov and Janet Paluh, University at Albany, Albany, NY

January 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
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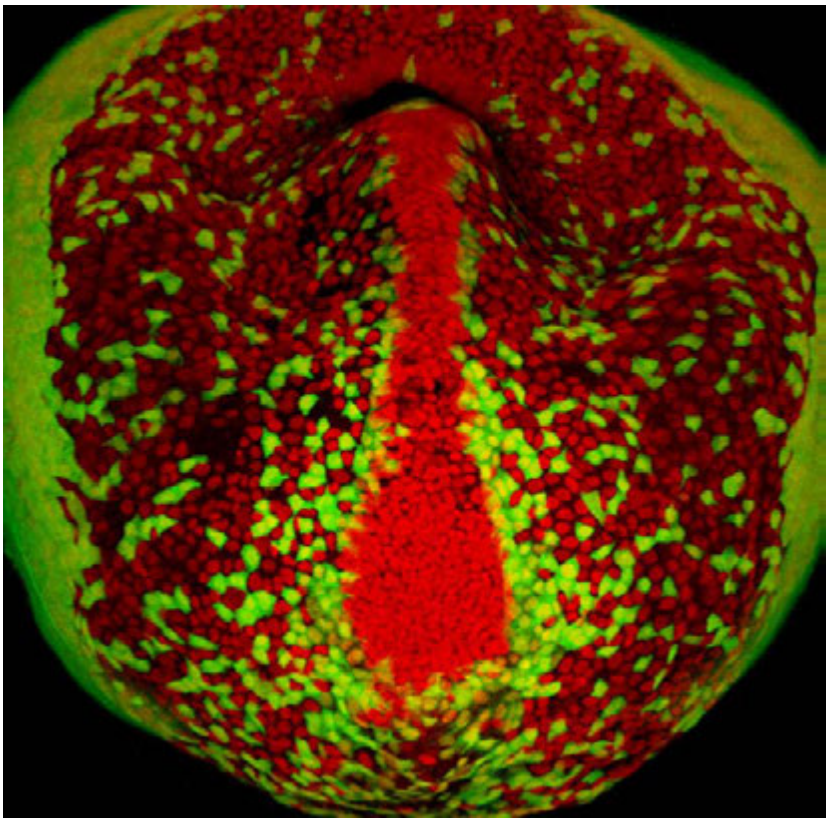

Mouse Embryonic Endoderm

The embryonic endoderm contains the stem cells of the respiratory and digestive tracts and associated organs, such as lungs, liver and pancreas. It comprises cells of two origins: pluripotent epiblast (red) and visceral endoderm (green). Ventral view of a mouse embryo depicting the endoderm layer.

Source: Kat Hadjantonakis, Sloan-Kettering institute, New York, NY

February 2012

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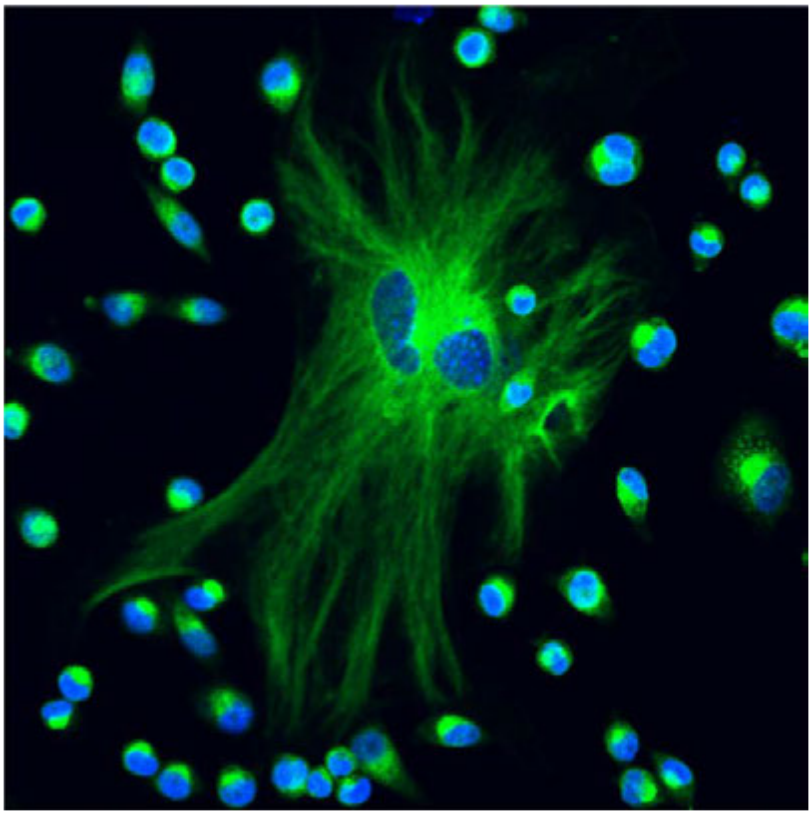

Cells and Cancer

The nestin-positive cells isolated from a metastatic prostate cancer patient and grown under stemness-promoting conditions (short-term collagen type I adherent culture in serum-free stem cell medium).

Source: Galina I Botchkina, Stony Brook University Medical Center, Stony Brook, NY
Natalia Peunova, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

March 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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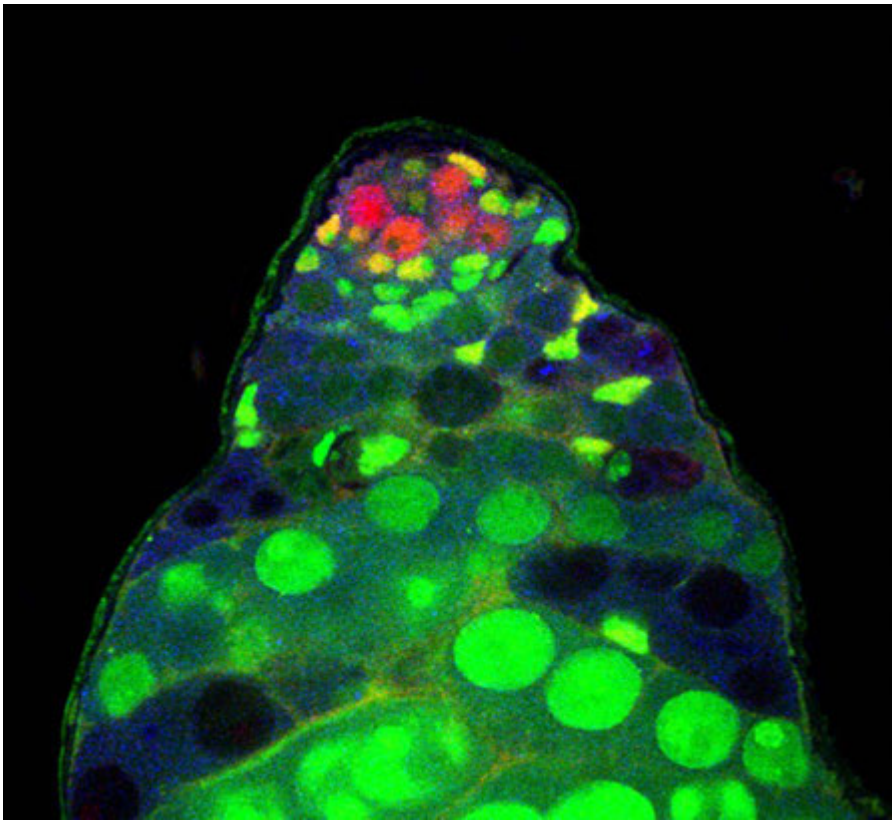

High STAT Activity in Germline Stem Cells in the Drosophila Testis

Activated STAT, a transcription factor, is red; negatively-marked FRT82B clones lack GFP (green); and gamma-tubulin, which marks the centromere, is blue. Germline stem cells express high levels of activated STAT (red) surround the niche (not labeled). Yellow cells are somatic stem cells that are positive for STAT (red) and are wild-type for the clone marker (GFP).

Source: Marc Amoyel and Erika Bach, New York University School of Medicine, New York, NY

April 2012

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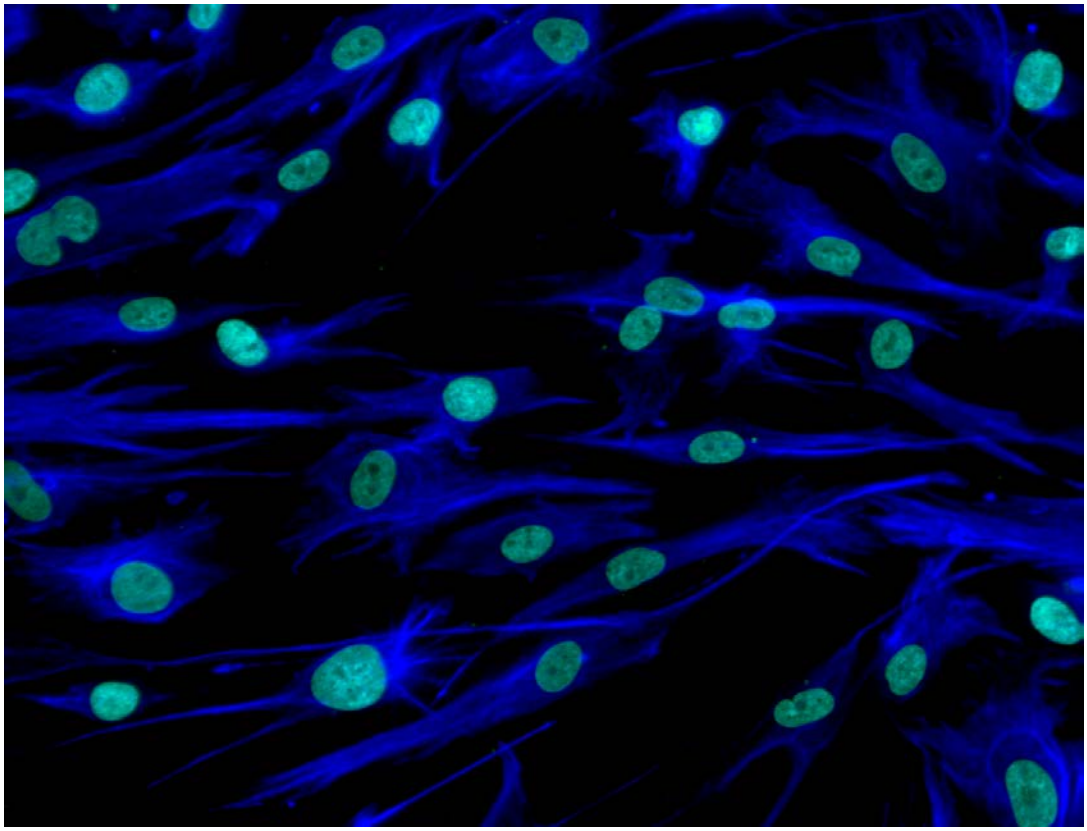

Purified Mesenchymal Progenitors Derived from Human Embryonic Stem Cells

Mesenchymal progenitor cells are capable of multilineage differentiation into bone, cartilage, fat and skeletal muscle. In this experiment, human embryonic stem cells (H1/WA01) were induced to differentiate into mesenchymal progenitors before purification by flow cytometry. Vimentin protein (dark blue) is characteristic of purified mesenchymal progenitors; the nuclei are counterstained with DAPI (blue-green).

Source: Natalia Novoa and Mark J. Tomishima, Sloan-Kettering Institute, New York, NY

May 2012

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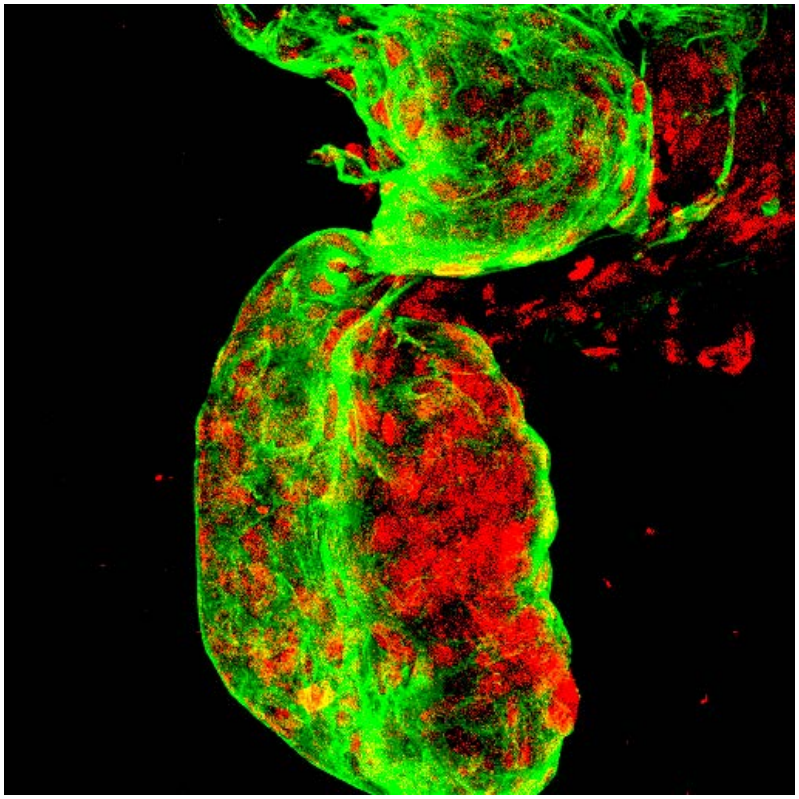

Spatial Organization of Cardiomyocytes in an iPS Cells-derived Embryoid Body

Human induced Pluripotent Stem (iPS) cells were differentiated in vitro to form 3D cellular aggregates called embryoid bodies (EBs) comprising of all three germ layers. A spontaneously beating EB was immunostained using anti-α–Actin antibody to label individual cardiomyocytes (green fluorescent) and all the cells were counterstained using Propidium Iodide that labels their nuclei (red fluorescent). The image was acquired by laser scanning confocal microscopy.

Source: Mayurika Desai and Charles Antzelevitch, Masonic Medical Research Laboratory, Utica, NY

June 2012

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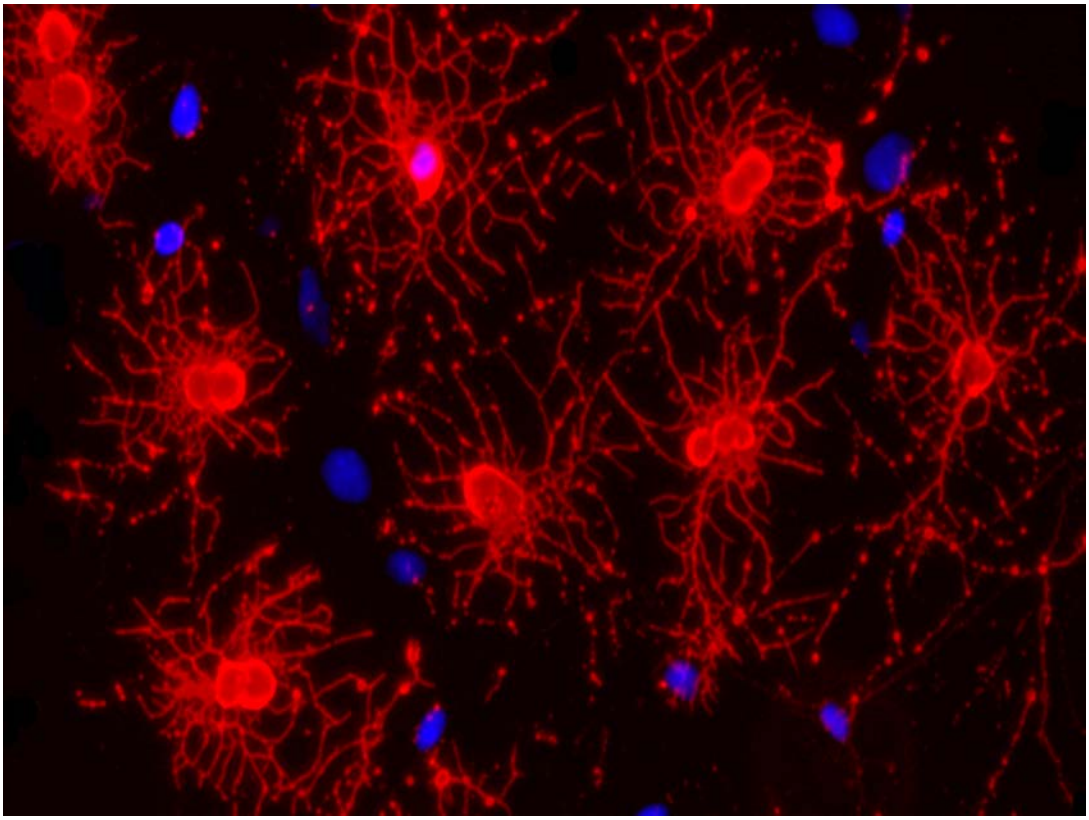

Oligodendrocytes

Oligodendrocytes derived from human embryonic stem cells (hES) expressing O4 surface antigen (red). The cell nuclei are labeled with DAPI (blue). Newly developed protocols allow the derivation of oligodendrocyte progenitors from hES cells and their maturation into functional cells capable of myelinating the Central Nervous System (CNS).

Source: Tamara Major and Viviane Tabar, Memorial-Sloan Kettering Cancer Center, New York, NY

July 2012

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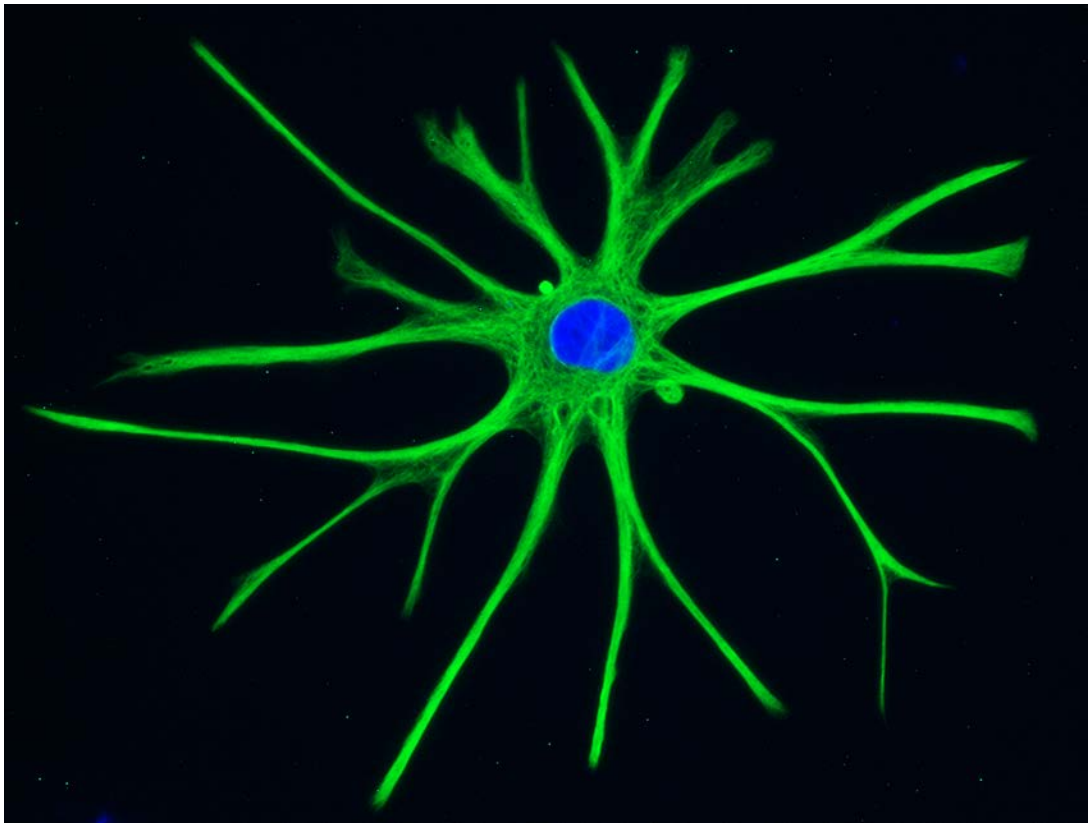

iPS Astrocyte

A human C27 iPS-derived astrocyte in culture: DAPI staining for cell nucleus (blue) and glial fibrillary acidic protein (green)

Source: Devin Chandler-Militello and Steven Goldman, University of Rochester Medical Center, Rochester, NY

August 2012

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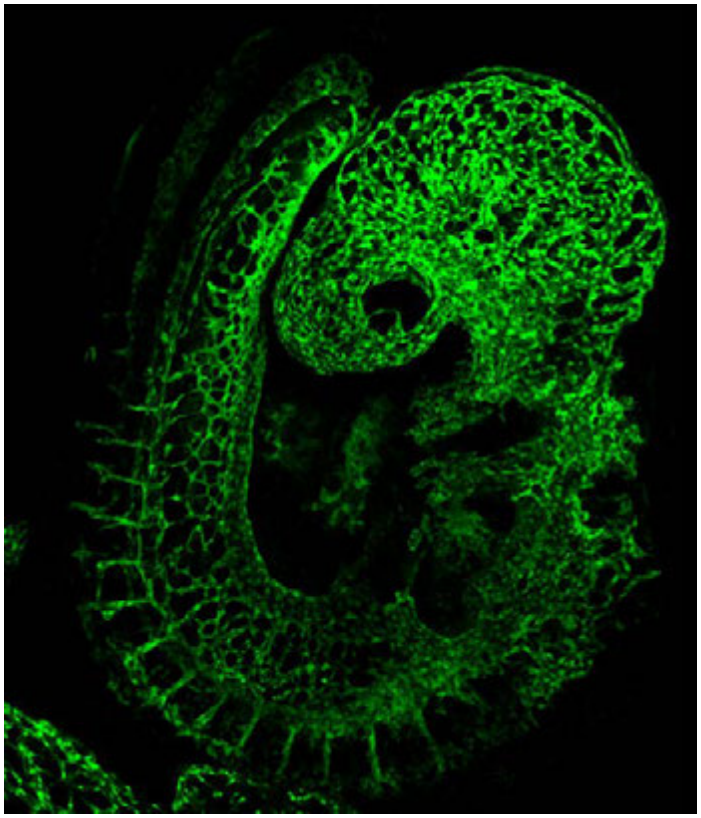

Vascular Foci

Human embryonic stem cells that carry an endothelial specific reporter transgene are differentiated in conditions that foster vascular specification. The image depicts vascular foci comprised of thousands of endothelial cells in a VEGR2-GFP transgenic mouse.

Source: Daylon James and Shahin Rafii, Weill Cornell Medical College, New York, NY

September 2012

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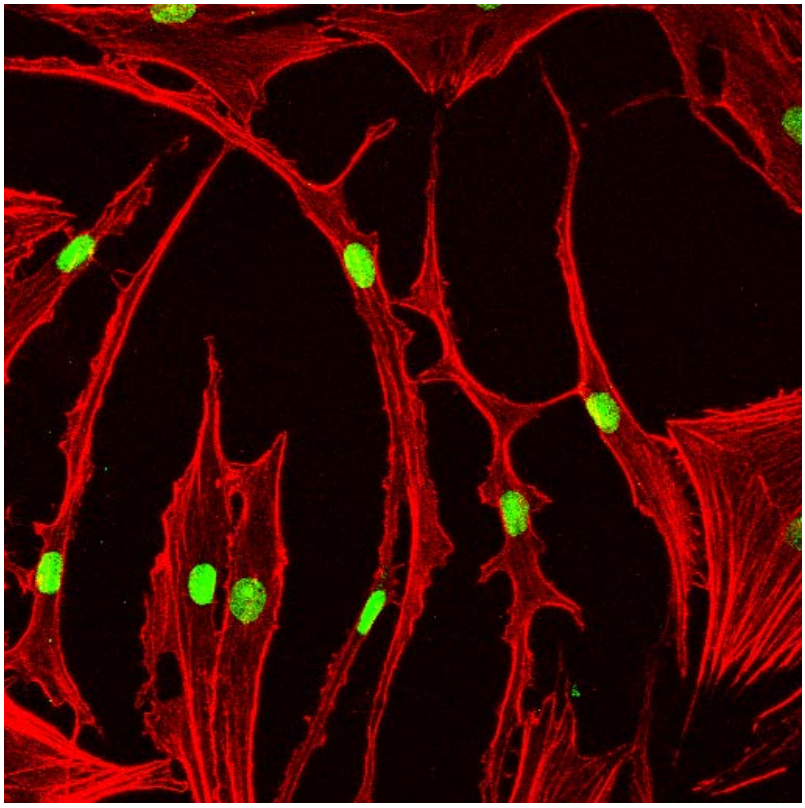

Human Mesenchymal Stem Cells (hMSC) Sense Each Other on Collagen-I Coated Plates

HMSC build a group consensus in response to extracellular matrix mediated stress. The behavior of the group in a particular microenvironment helps dictate hMSC functions and guide differentiation. The f-actin cytoskeleton is stained with phalloidin 488 (red) and the nuclei are stained with sytox orange (green). Images were collected using a Zeiss Confocal Microscope at 40X.

Source: Kira Henderson and George Plopper, Rensselaer Polytechnic Institute, Rensselaer, NY

October 2012

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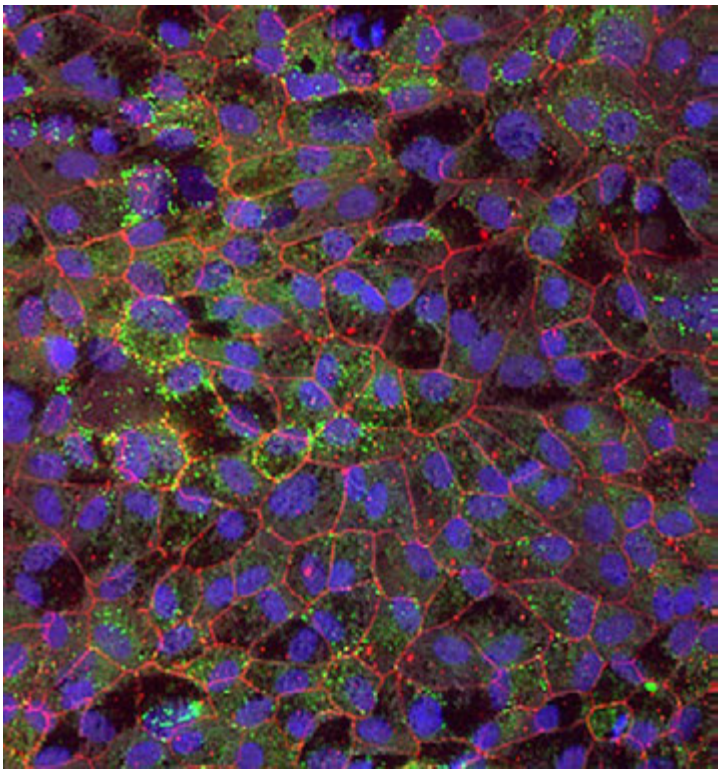

Retinal Pigment Epithelial (RPE) Cells are Plastic

RPE are multipotent and in defined conditions can readily and reproducibly generate ectodermal and mesodermal lineages. This plasticity may explain human pathologies attributed to the RPE, including heterotopic ocular ossification and anomalous intraocular adipogenic deposits. This image describes human fetal RPE differentiating toward the adipocyte lineage. Illustrating the cells transition are the pigment (evidence of RPE identity), ZO-1 staining (hallmark of an epithelium) in red, and LipoTox TM (an adipocyte marker) in green.

Source: Enrique Salero, Timothy A Blenkinsop, and Barbara Corneo, Neural Stem Cell Institute, Regenerative Research Foundation, Rensselaer, NY

November 2012

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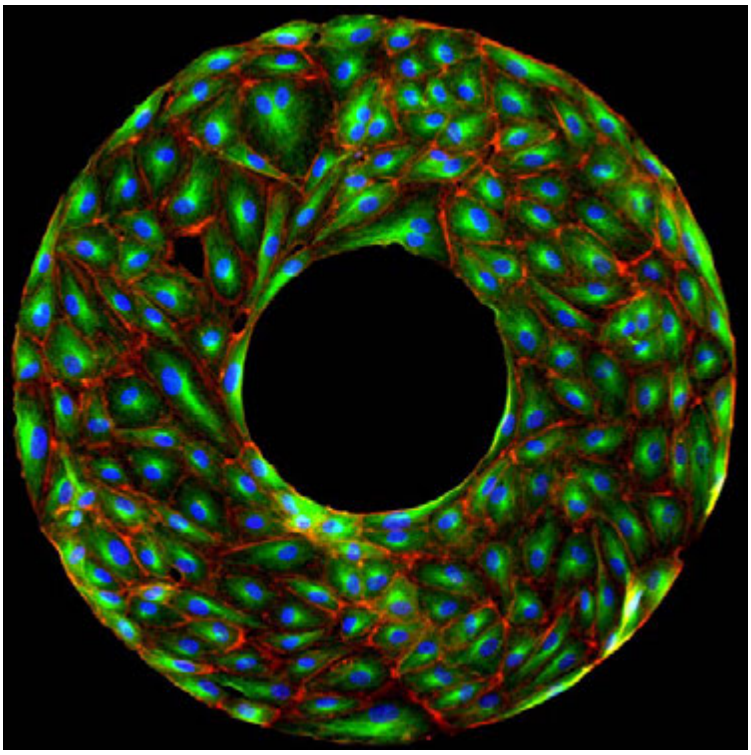

Cell Polarity and Chirality

Human endothelial cell lineage on a micropatterned ring (inner diameter: 250 µm, width: 200 µm) stained for actin (red), tubulin (green), and nuclei (blue). Cells form a 'rightward' chiral alignment, while polarized by positioning their centrosomes (bright green) rather than cell nuclei closer to each boundary. This is the first image revealing that individual cells have intrinsic invariant chirality, which depends on cell phenotype. Such a microfabrication-based platform can be potentially used to study the initiation of the left-right asymmetry of life, diagnose disease, and study factors involved with birth malformations.

Source: Leo Q Wan and Gordana Vunjak-Novakovic, Columbia University, New York, NY

December 2012

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