

**Advanced Cell Technology**  
**(OTCBB: ACTC)**

**CAUTIONARY STATEMENT  
CONCERNING FORWARD-LOOKING STATEMENTS**

This presentation contains “forward-looking statements” as defined under the federal securities laws. Actual results could vary materially. Factors that could cause actual results to vary materially are described in our filings with the Securities and Exchange Commission. You should pay particular attention to the “Risk Factors” contained in documents we file from time to time with the Securities and Exchange Commission. The risks identified therein, as well as others not identified by the Company, could cause the Company’s actual results to differ materially from those expressed in any forward-looking statements.



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- **The Totipotency of hES Cells**
- **Histocompatibility Strategies**
- **Development of RPE, Hemangioblasts**
- **ACTCellerate Pipeline**



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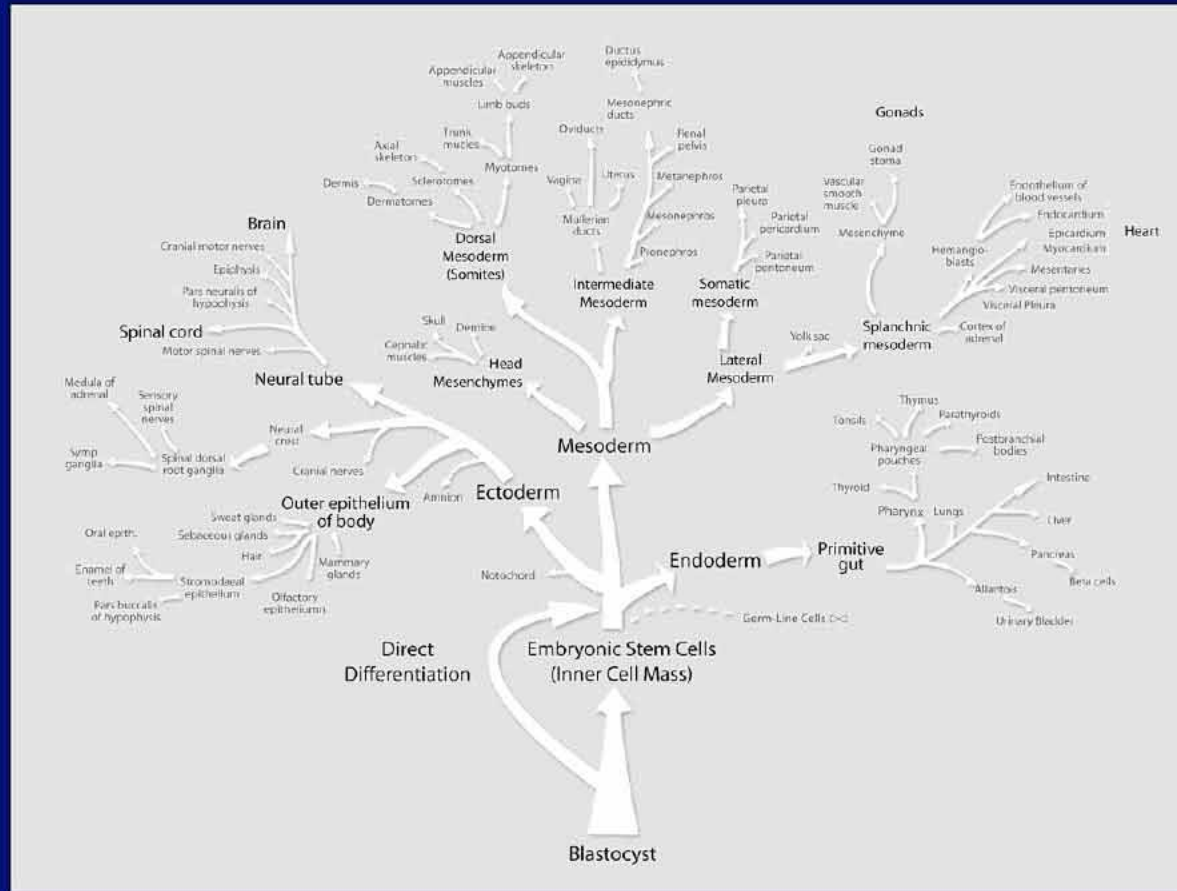
## *The Opportunity:*

- All Somatic Cell Types
- Ease of Gene Targeting
- Regenerative Gene Expression



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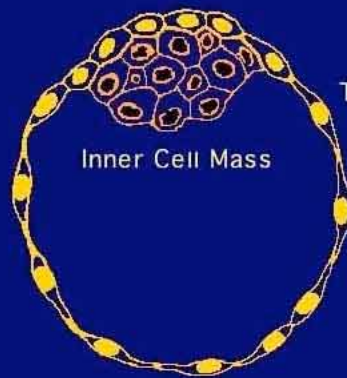
# ACTCellerate Cell Lines



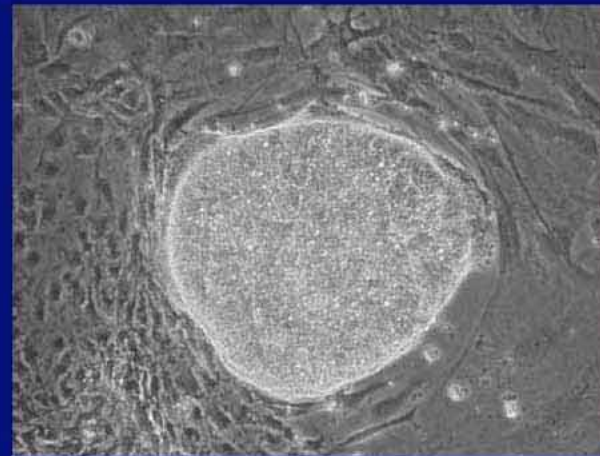


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## ***Federal Policy and New Lines***



Trophectoderm

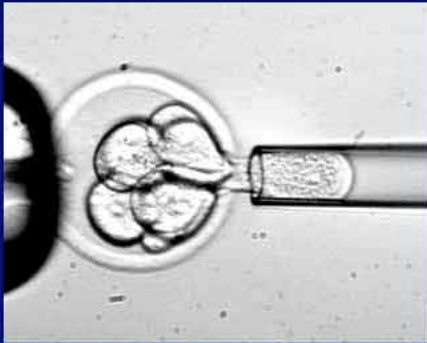




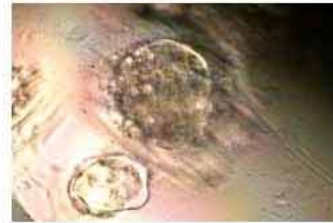
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# Histocompatibility

## Federal Policy and New Lines



### Outgrowth



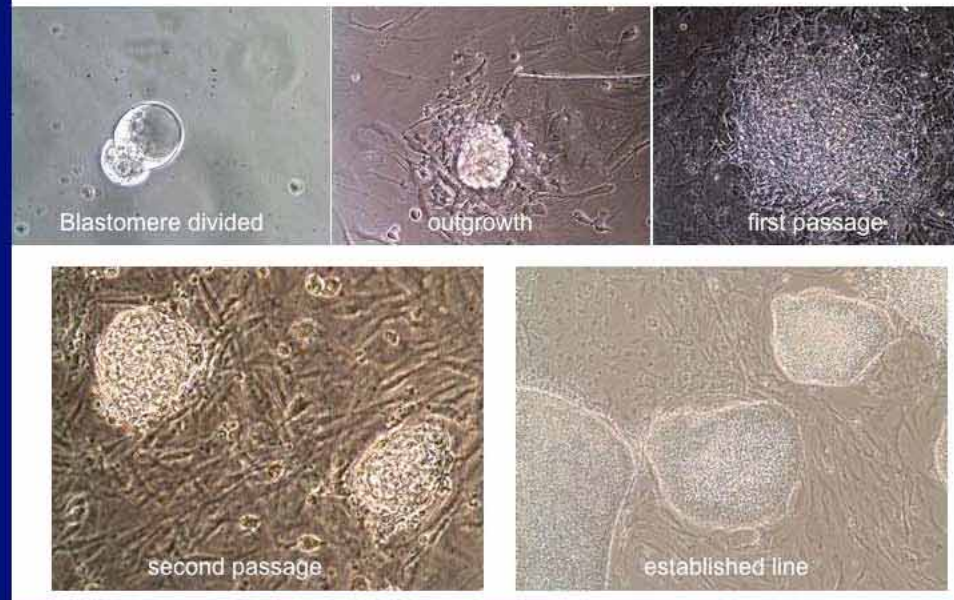


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# Histocompatibility

## Federal Policy and New Lines

Stages of derivation of hES cells from single blastomere





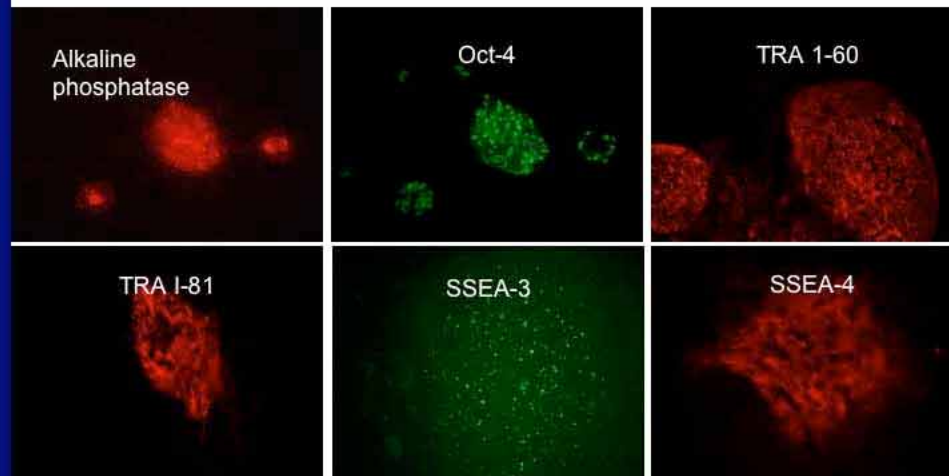
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# Histocompatibility

## Federal Policy and New Lines

### Characterization of Single Blastomere-Derived hES Cell Lines

#### Markers of pluripotency

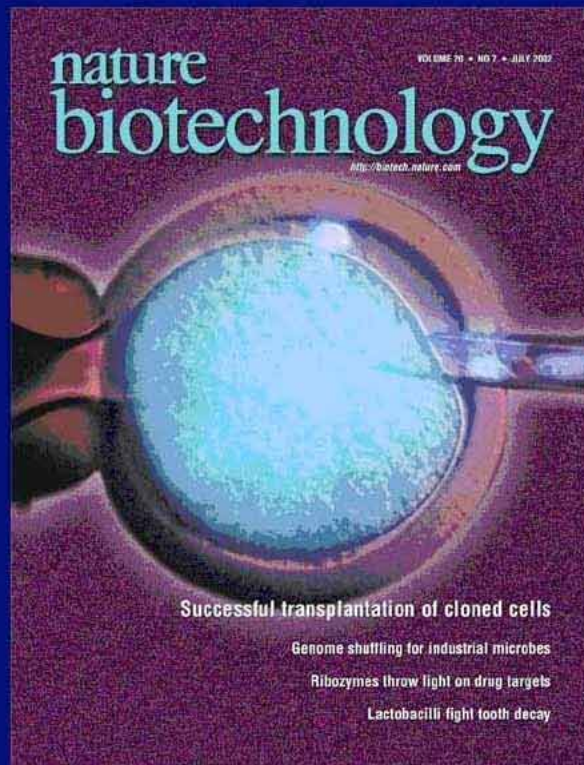




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## Histocompatibility

### Transplanted SCNT Bovine Cells with Allogeneic Mitochondria



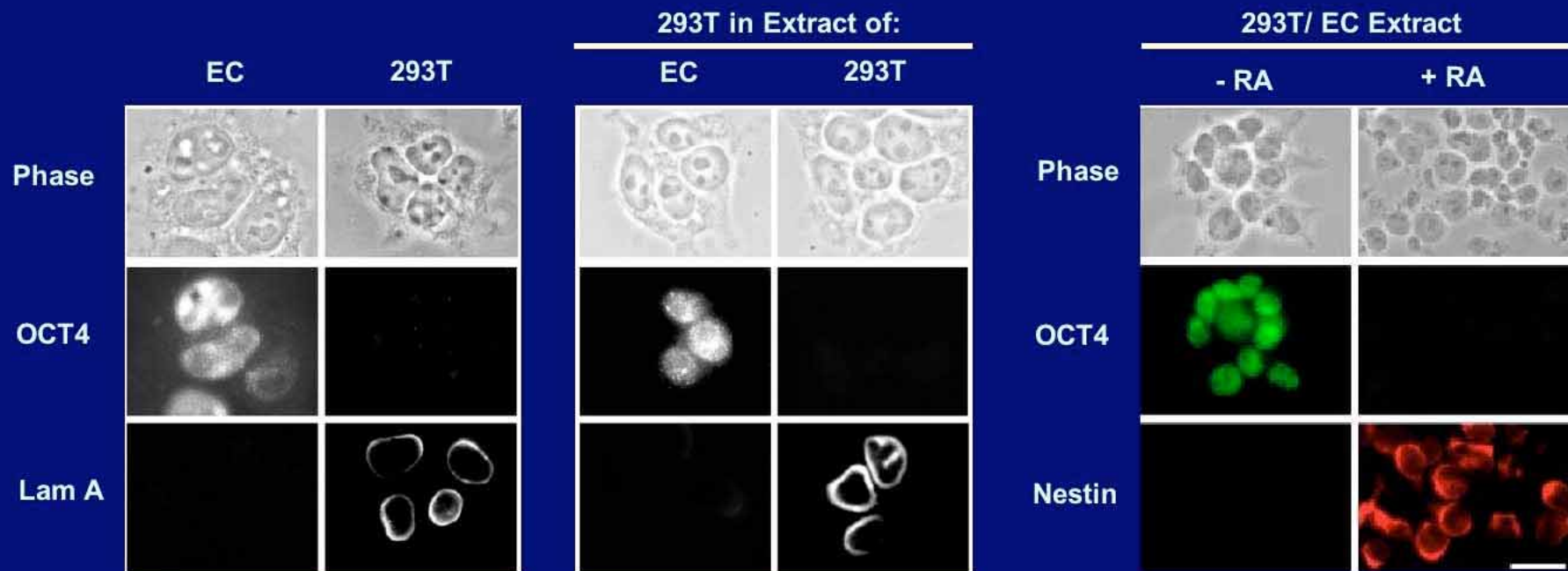
Lanza et al, Nature Biotech. 2002



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# Histocompatibility

## Fusion-Mediated Reprogramming



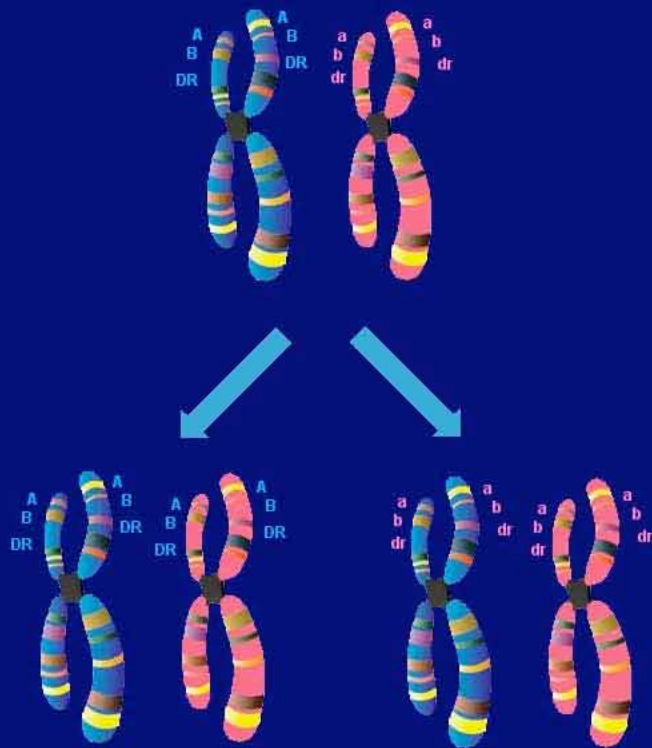
Taranger et al, (2005) Mol. Biol. Cell 16: 5719



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# Histocompatibility

## Reducing the Complexity of HLA Genes



*Matching A&B Only:*

Complexity of Heterozygous 767,746

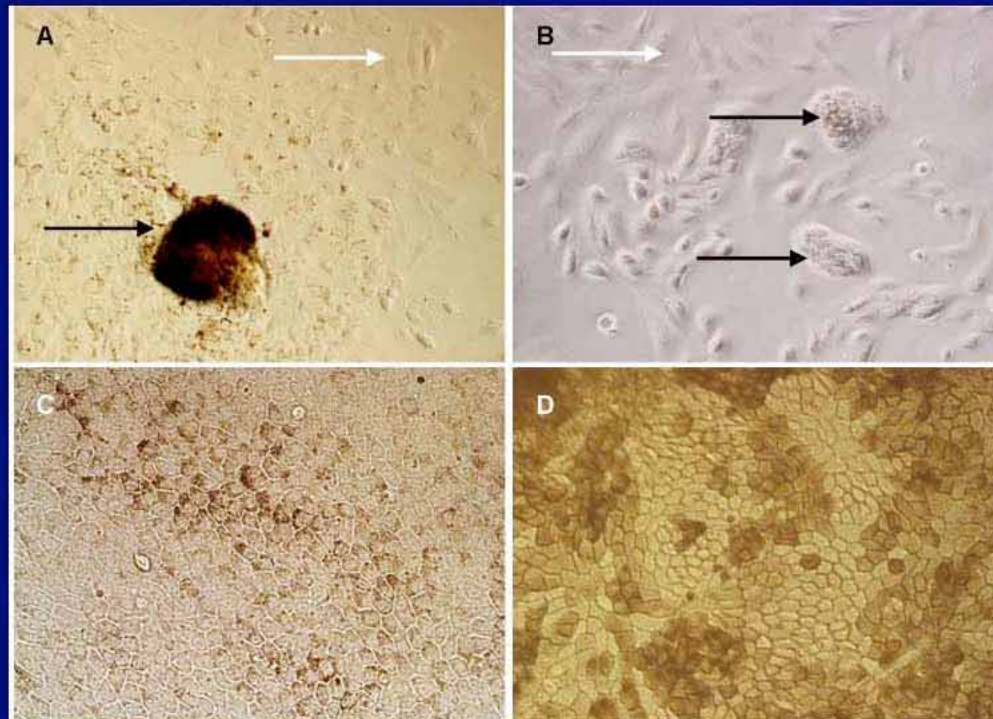
Complexity of Homozygous 1,708



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# RPE & Hemangioblast Cells

## Development of hES-Derived RPE

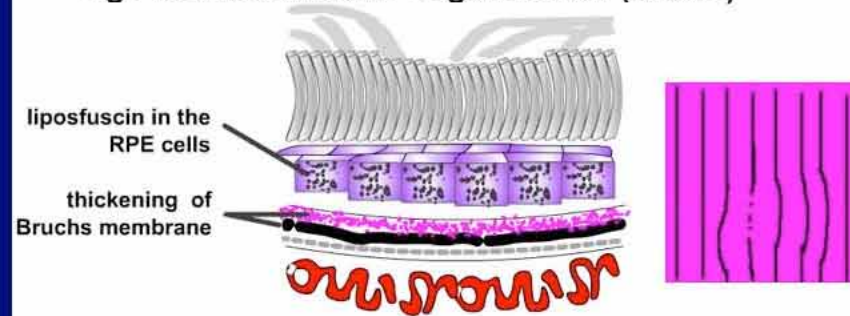




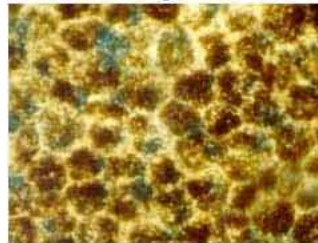
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# RPE & Hemangioblast Cells

## Age Related Macular Degeneration (ARMD)



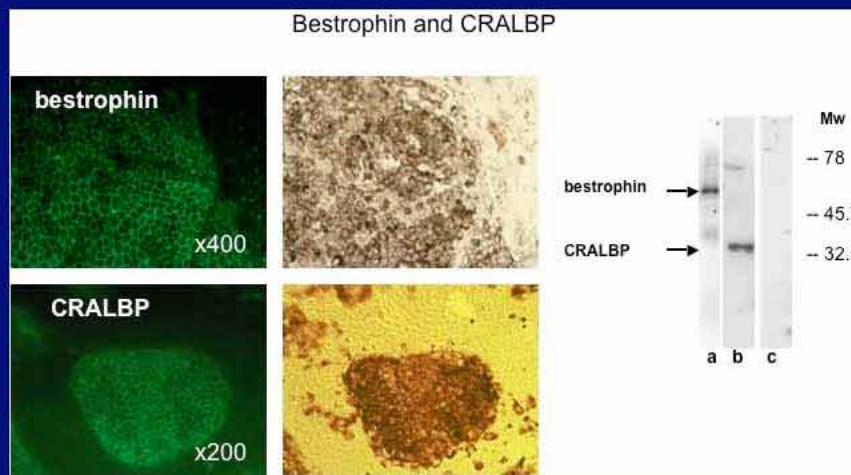
Invisible changes in the retina





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# RPE & Hemangioblast Cells

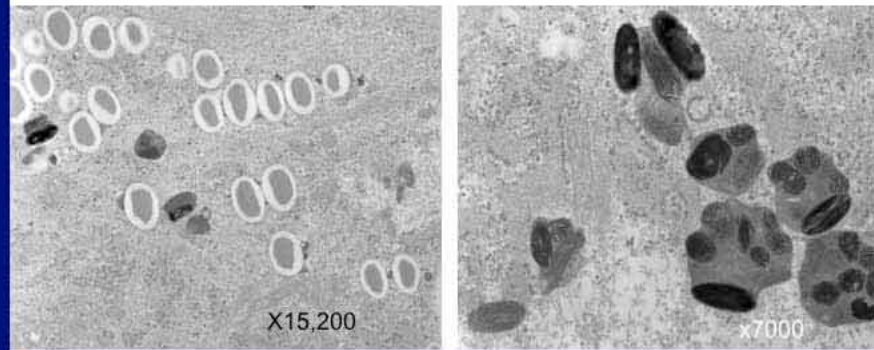




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## ***RPE & Hemangioblast Cells***

Phagocytosis of latex beads





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## **RPE & Hemangioblast Cells**

**All hES cell lines in our experiments  
reproducibly generated RPE  
which could be passaged, characterized and expanded**

**Wicell hES cell lines**

WA01, WA07, WA01 – three lines, 23 experiments

**Harvard hES cell lines**

HUES1, HUES2, HUES3, HUES5, HUES6, HUES7, HUES8, HUES10  
– 6 lines, 22 experiments

**ACT hES cell lines**

**MA01\***, MA03, MA04, **MA09\***, MA14, MA40, MAJ1  
- 7 lines, 25 experiments and going on

\* -- single blastomere-derived hES cells

hES-RPE cells express RPE markers, show typical RPE morphology  
and behavior(transdifferentiation and differentiation in culture),  
and no longer express markers of hES cells



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# RPE & Hemangioblast Cells

## **Animal studies – RPE transplantation into subretinal space of RCS rats**

(in collaboration with Dr. Ray Lund, University of Utah)

**Royal college of Surgeons (RCS) rats**: will naturally become blind in several weeks due to RPE degeneration and photoreceptor death

### **Study design**

cell line RPE WA09 (former H9)

Control: culture medium

### **Tests:**

head tracking (behavior)

electroretinogram (ERG)

histology

### ***In vitro* assessment:**

molecular markers of RPE

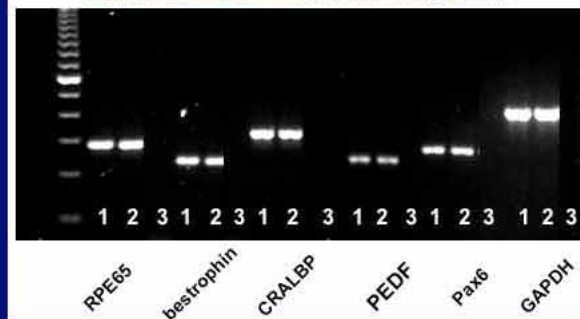
morphology



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# RPE & Hemangioblast Cells

WA09 RPE used for transplantation in RCS rats

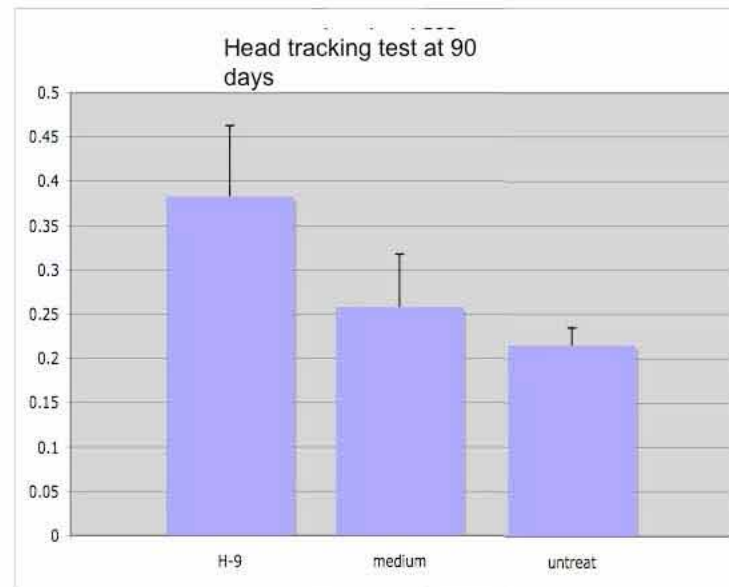




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## RPE & Hemangioblast Cells

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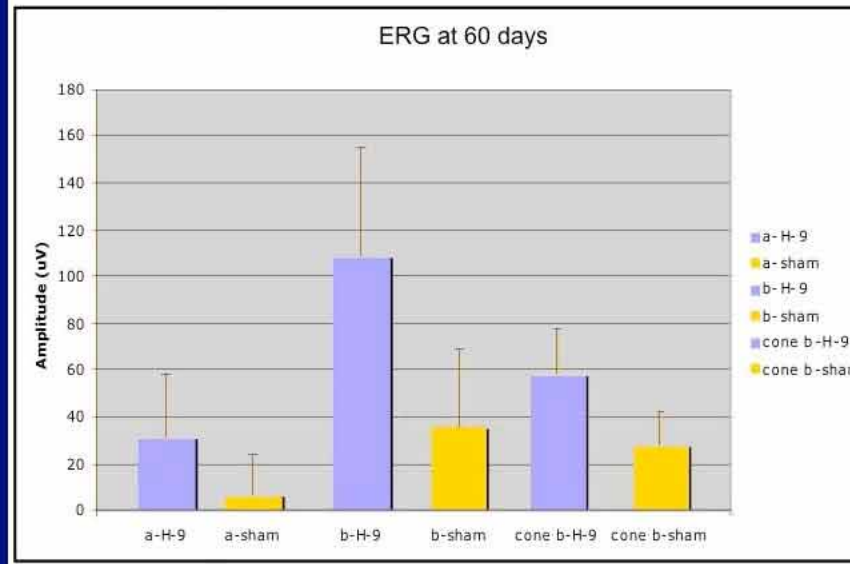




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# RPE & Hemangioblast Cells

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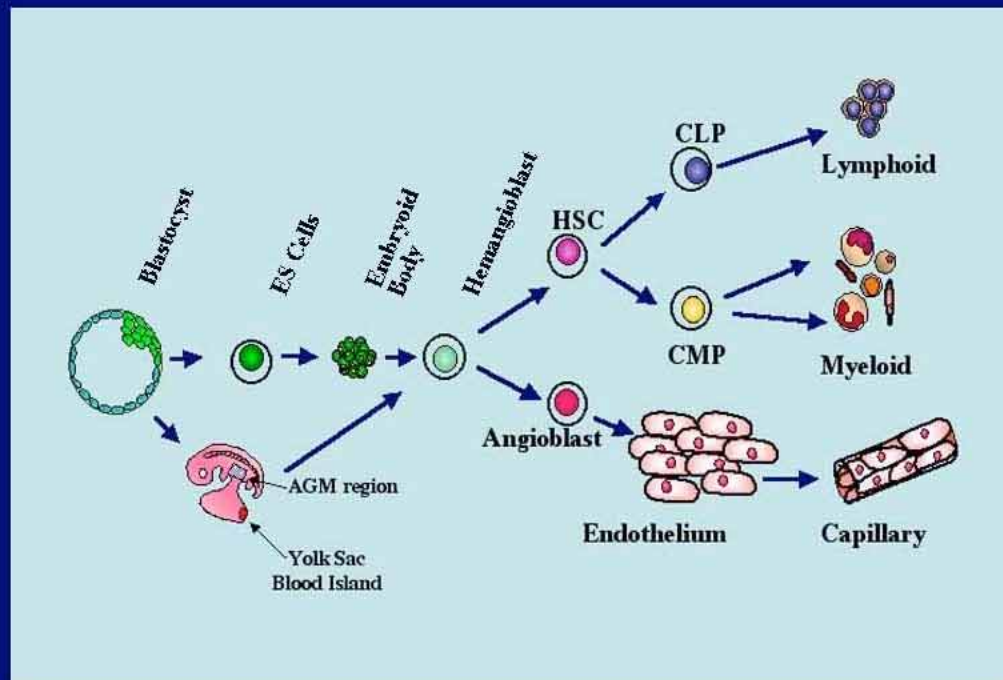




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# RPE & Hemangioblast Cells

## The Opportunity in Hemangioblasts

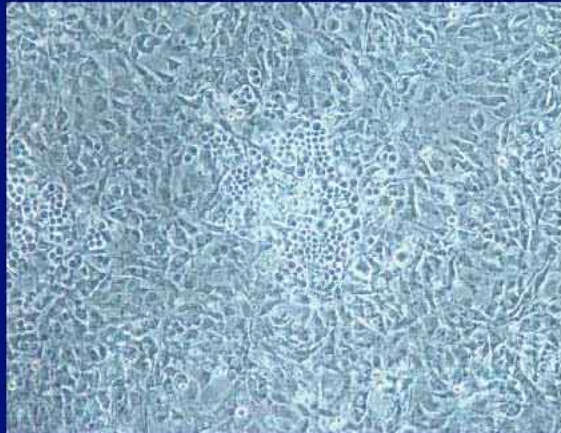




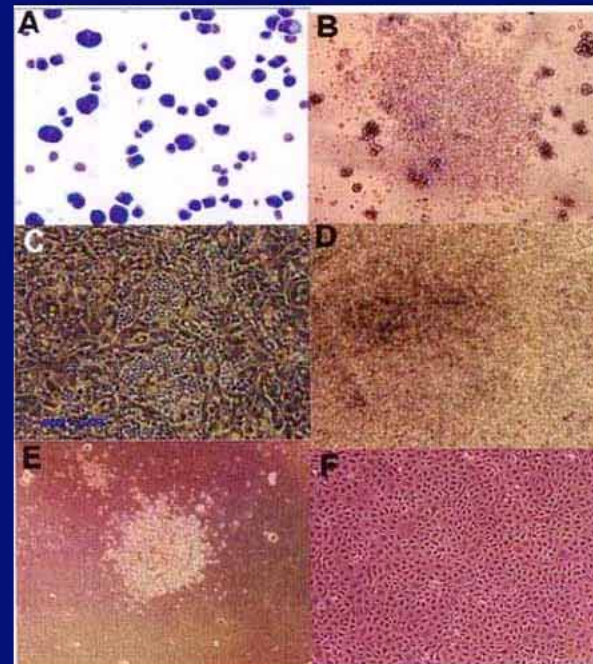
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## **RPE & Hemangioblast Cells**

### **Characterization of Cloned Hemangioblasts**



**c-kit + cloned FL cells**



Lanza et al (2005) *Cloning & Stem Cells* 7: 95-106

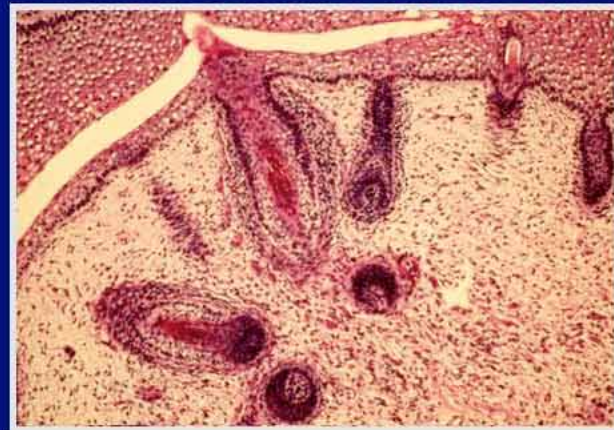


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## **ACTCellerate Cell Lines**

### ***Regenerative Dermatology***

- **Full Regeneration in Embryonic Skin**
- **Easiest of cells to manufacture and scale under GMP**
- **Application in scarless wound healing, skin aging & elastogenesis**





# ACTCellerate Cell Lines



Human Embryo-Derived Cells



hES Cell Line



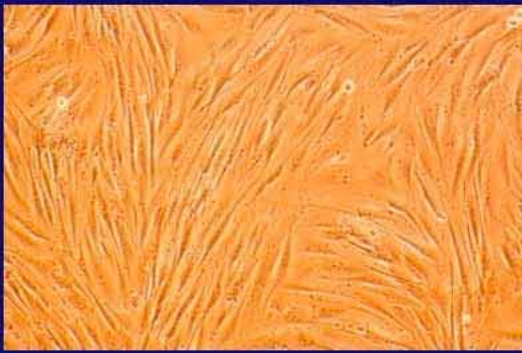
Scaling in Rollers



Gene Expression Profile



## ACTCellerate Cell Lines



ACTC60

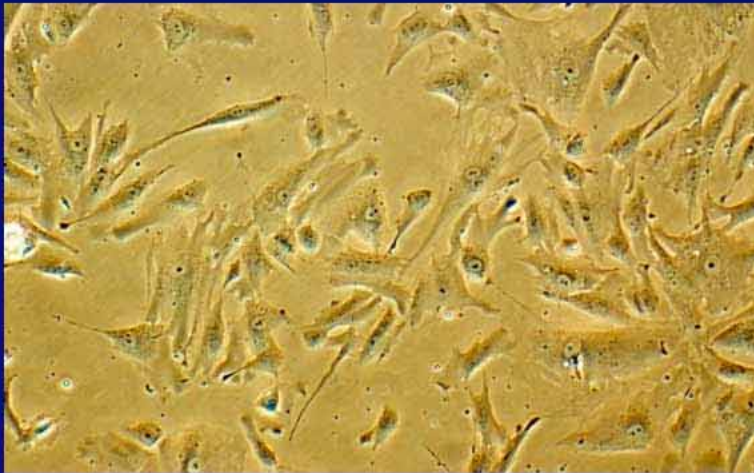
### Smooth Muscle

- Directly scalable in rollers
- ACTG2 +
- MaxiK Potassium Channel +
- TEK +
- LOXL4 +
- Potential applications in cardiovascular, vascular, and smooth muscle cell disorders.



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## **ACTCellerate Cell Lines**



ACTC162  
**Cardiac Progenitor**

**Cardiac  
Muscle**

**ACTC  
MYH7  
MYL4  
MYH3  
TNNT2**

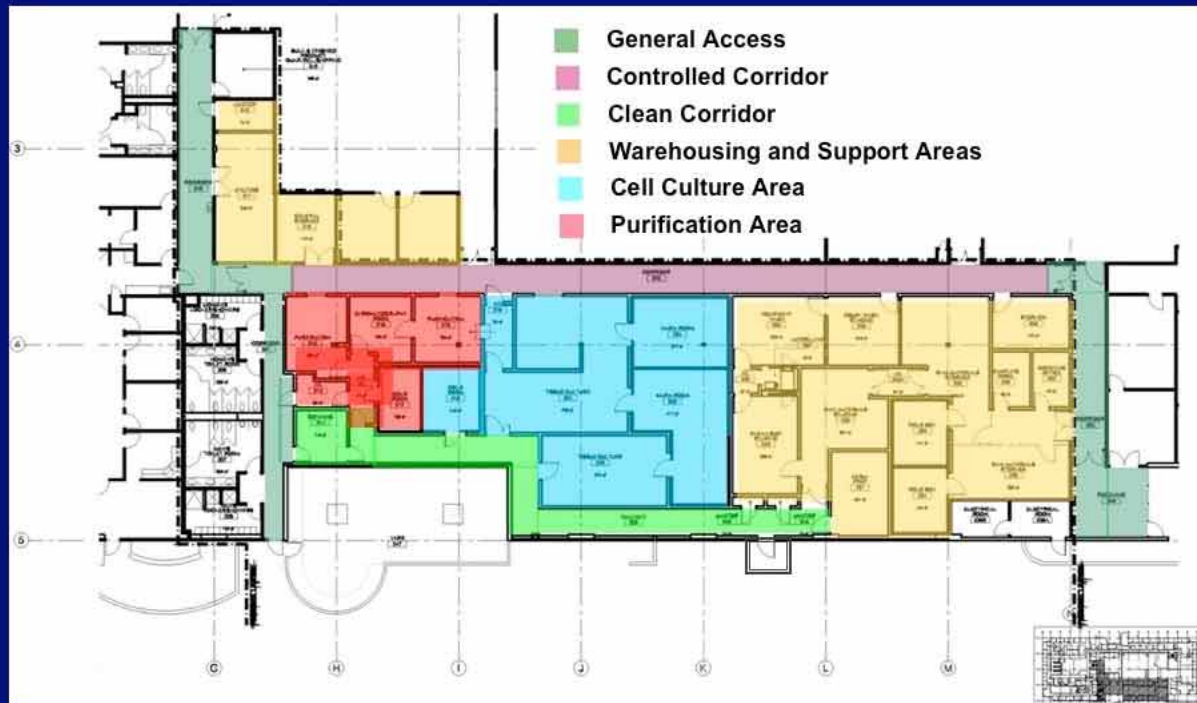
**Neuronal**

**NEF3  
NEFL  
MEIS1  
CDH2  
SILV**



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# ACTCellerate Cell Lines





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