Using human stem cells to understand & treat disease

PLURIPOTENT HUMAN CELLS

HUMAN GENETICS

GLIOBLASTOMA

Josh Chenoweth, Paul Tesar & NIH stem cell facility

TERATOCARCINOMA

LIVER DEVELOPMENT & FUNCTION

Jong-Hoon Kim (NIH & Korea University)
Controlling embryonic stem cell differentiation in the mouse

Mdm2 expression in the E3.5 (A) and E5.5 embryo (B). The E5.5 embryo prior to dissection of the epiblast and the epiblast after 3 days in culture (C).

Tesar et al., Nature, 2007
Cell types in the early embryo

Days after fertilization

- E2.5: Zygote
  - Mouse ES
  - Human ES
  - Embryoid Body
  - Ectoderm
  - Mesoderm
  - Endoderm

- E3.5: Morula
  - Inner Cell Mass
  - Trophoderm
  - Extra-emb. Endoderm

- E4.5: Implant
  - Epiblast
  - NIH

- E5.5: Endoderm

- E6.5: Embryoid Body
  - Mes-endoderm

Controlling human embryonic stem cells

Whole transcriptome characterization of undifferentiated hES cells
Controlling differentiation of human embryonic stem cells

Whole transcriptome characterization of hES cells
Controlling differentiation of human iPS cells

Whole transcriptome characterization of hES cells
Polymorphic levels of gene expression – Lung & prostate cancer

Glutathione S transferase (GSTT1)

Agilent: CGH Analytics used to assess copy number
Polymorphic levels of gene expression – Glioblastoma & Teratocarcinoma

Generating Functional Hepatocytes