Announcements

- Introducing... Han-Hwa, M3 TA

Pre-lab Lecture

- Cell/Tissue Culture Basics
- Tissue Engineering (TE) toolkit
- Mod 3 Overview
- Today in Lab (Mod 3 Day 1)
Tissue Culture (TC) Environment

- What will “feel” physiological to a cell?
  
  \[ T = 37^\circ C \]
  
  \[ \text{pH} \approx 7.2-7.4 \Leftrightarrow \text{CO}_2 \] (typical 5%) 
  
  humidity
  
  [salts] (burst/shrink)
  
  ambient \text{O}_2
  
  + sterility

Image from http://www.stemcellresources.org/library_images.html
Tissue Culture (TC) Medium

- What do cells need to survive?

**Food and/or cell life:**
- Energy source: glucose and/or L-glutamine (sometimes Myc)
- Essential amino acids
- Optional: non-essential aa
- Vitamins, minerals, lipids
- Serum (in blood): growth factors

**Non-food (spare):**
- Antibiotics (Pen/Strep)
- Optional antimycotics (1st)
- Phenol red (pH track)
Components of a TE construct

**scaffold/matrix**
- usually degradable, porous

**soluble factors**
- made by cells or synthetic
- various release profiles

**cells**
- precursors and/or differentiated
- usually autologous

**integrated implantable or injectable device**
Module overview: lab

Day 1: design
Day 2: seed cultures
Day 3: viability assay

Day 4: prep RNA + cDNA
Day 5: transcript assay
Day 6: protein assay
Day 7: remaining analysis

Day 8: your research ideas!
Today in Lab: Research + Design

• Practice cell culture with mouse cell line
• Skim >=3 out of 8 articles
  – Read abstract
  – Skim methods: find typical alginate η0, cell ρ, etc.
  – Skim results/discussion: summarize in 1-2 sentences
  – Goal: select desired info. (vs. close readings)
• Make your own plan
  – Vary one parameter: simple or sophisticated
  – Check cell availability with teaching faculty
  – Request unique materials/equipment needed
  – Goal: choose a explicit Q and conceive design to test it