

- Announcements

- ❖ Introducing... Han-Hwa, M3 TA

- ❖ Next time: start Module 2

- 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?

$T = 37^{\circ}\text{C}$

$\text{pH} \sim 7.2 - 7.4$

CO_2 + bicarbonate
5%

O_2 ambient
[salt]
humidity

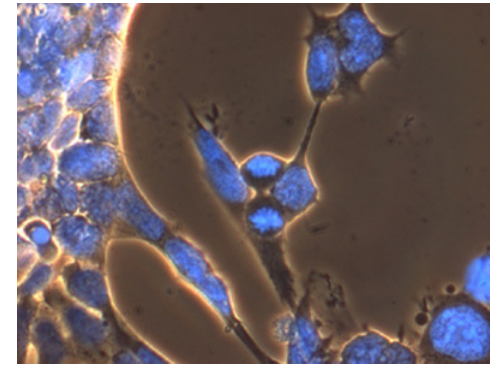


Image from http://www.stemcellresources.org/library_images.html

* sterility

Tissue Culture (TC) Medium

- What do cells need to survive?

Food and/or cell life:

energy source: glucose (L-glutamine)
(Na Pyr)
essential amino acids } building blocks
non-ess. aa } or co-factors
vitamins, minerals, lipids } for rxns.

Serum (~blood): growth factors

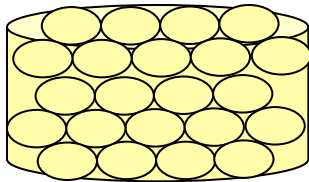
Non-food:

antibiotics (Pen/Strep)
optional antimycotic (1%)
phenol red (tracks pH)

Components of a TE construct

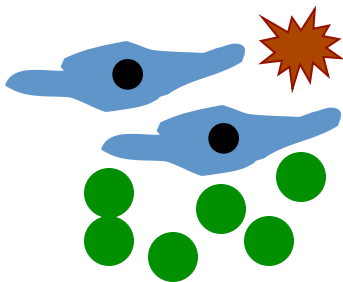
scaffold/matrix

- usually degradable, porous



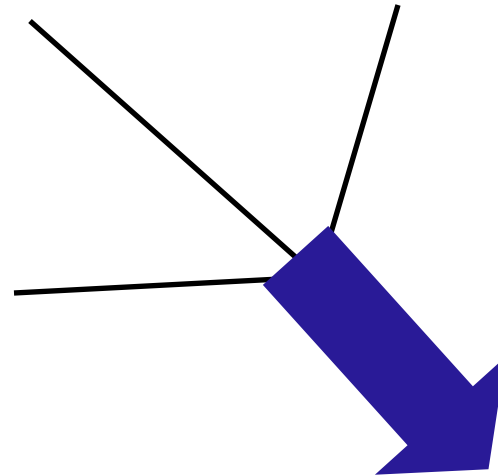
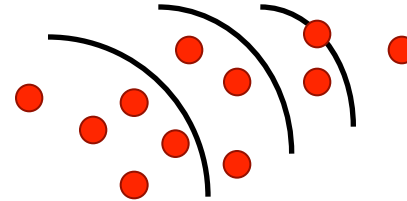
cells

- precursors and/or differentiated
- usually autologous

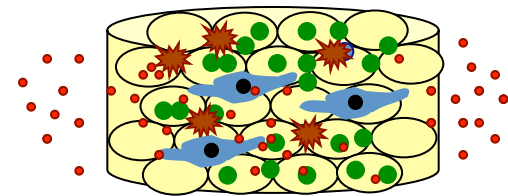


soluble factors

- made by cells or synthetic
- various release profiles



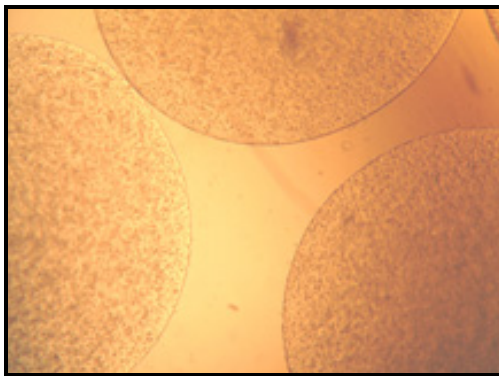
integrated implantable or injectable device



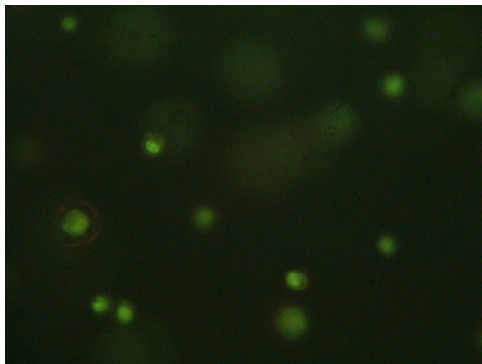
Module overview: lab

Day 1: design

Day 2: seed cultures



Day 3: viability assay

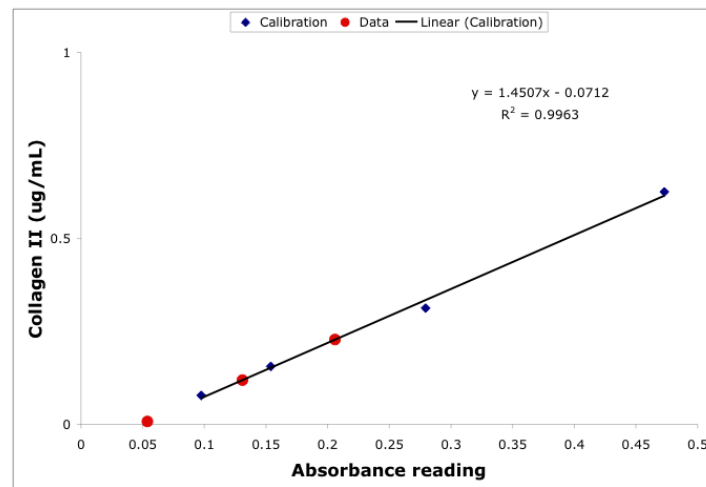
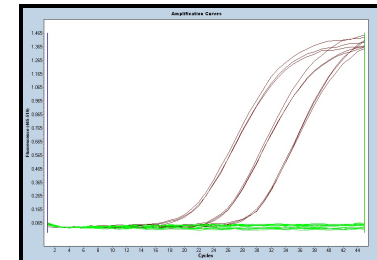


Day 4: prep RNA + cDNA

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: *typical alg. w/ cells, etc.*
 - Skim results/discussion: summarize in 1-2 sentences
 - Goal: *select desired info. (not close read)*
- Make your own plan
 - Vary one parameter: simple or sophisticated
 - ~~Check cell availability with teaching faculty~~
 - Request unique materials/equipment needed
 - Goal: *choose expt'l Q and conceive basic design*