

- Announcements

- Pre-lab Lecture

- ❖ Cell/tissue culture basics

- ❖ Tissue engineering (TE) toolkit

- ❖ Mod 3 overview

- ❖ Today in Lab (M3D1)

Announcements

- Module 2 report due Monday April 22nd 5 PM,
 - to 20109.submit@gmail.com
 - free late day if you see a Writing Fellow!
 - OH Fri by appt and Sun 2-4 (Shannon R eve and Sat pm)
 - evaluation: methods/results me; rest Alan
- Module 1 reports to be returned tonight
- Methods FNT: each step, concisely, in higher-level groupings
 - design → lab work (incl. steps done by us) → analytical methods
- Next time: arrive in 2 shifts (1 or 3 pm)... quiz before or after

- Introducing... Thomas, your TA for Module 3

Tissue culture (TC) environment

- What will “feel” physiological to a cell?

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

- O_2 (usually ambient)

- CO_2 (5%) \leftrightarrow bicarbonate
 \Rightarrow pH 7.2-7.4

- humidity

- right [salt]; osmolality

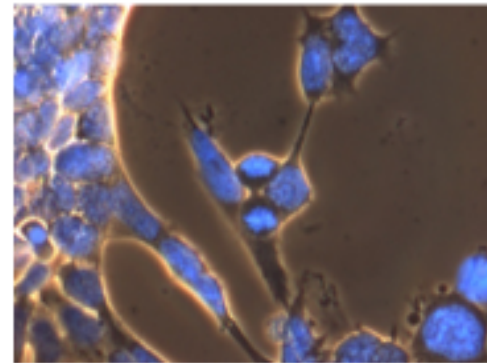


Image from http://www.stemcellresources.org/library_images.html

Sterility *

Tissue culture (TC) medium

- What do cells need to survive?

Food and/or cell life: energy; glucose; L-glutamine; (NaPyr)

essential amino acids
often, non-essential a.a.
vitamins, minerals, lipids } building blocks
or ~~for~~ co-factors
for cell rxns.

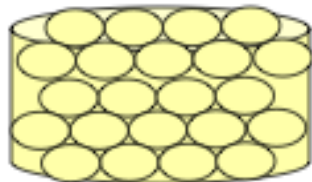
serum (~ blood): growth factors

Non-food: antibiotics (pen/strep)
optional: antimycotic (AmphB)
phenol red (tracks pH)

Components of a TE construct

scaffold/matrix

- usually degradable, porous



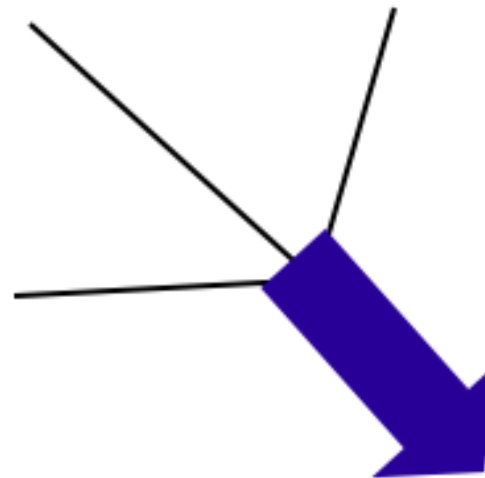
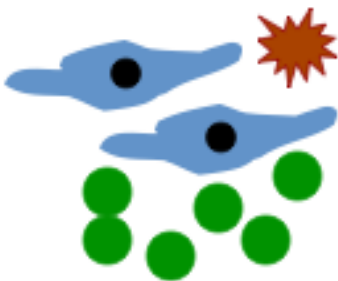
soluble factors

- made by cells or synthetic
- various release profiles

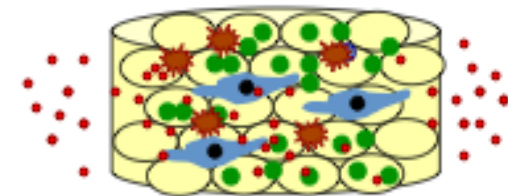


cells

- precursors and/or differentiated
- usually autologous



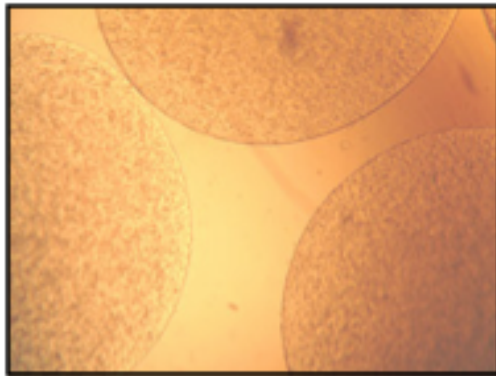
integrated implantable or injectable device



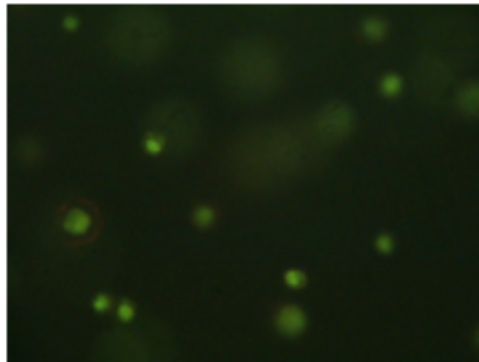
Module overview: lab

Day 1: design

Day 2: seed cultures



Day 3: viability assay

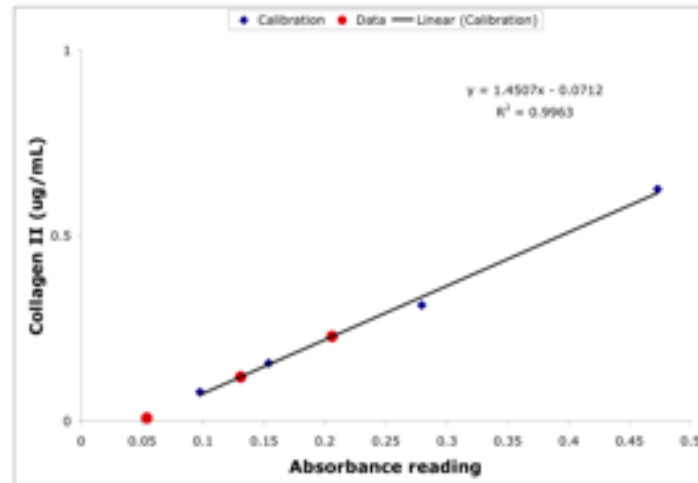
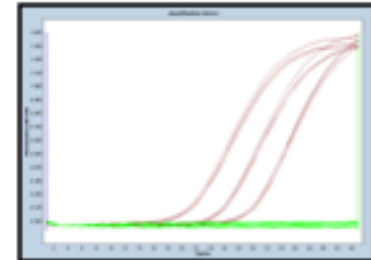


Day 4: prep RNA + cDNA

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: *typical alginate γ_0 cell ρ , etc.*
 - Skim results/discussion: summarize in 1-2 sentences
 - Goal: *get desired info. (vs deep reading 11-2)*
- Make your own plan
 - Vary one parameter: simple or sophisticated
 - Check cell availability with teaching faculty
 - Request unique materials/equipment needed
 - Goal: *choose an exptl Q and conceive of basic design*