

- Announcements
 - ❖ Introducing... Nicole, Mod 3 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°C

pH ~ 7.2 – 7.4 \longleftrightarrow CO₂ (5%)

[salts] (don't shrink)

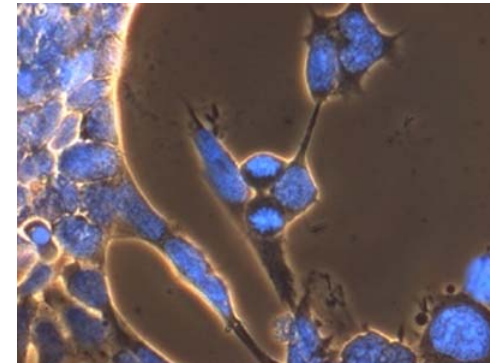
*cell density

surface/3D

ambient O₂

humidity

* sterility



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Tissue Culture (TC) Medium

- What do cells need to survive?

Food and/or cell life: energy: glucose and/or L-glutamine
(optional: Na Pyr)

essential amino acids
optional: non-ess. aa
vitamins, minerals, lipids } co-factors, reaction
building blocks

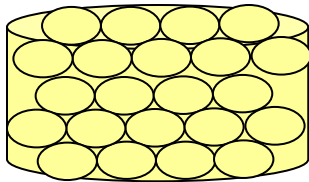
serum: cytokines

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

Components of a TE construct

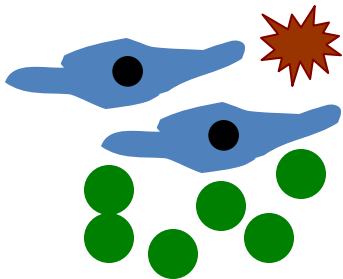
scaffold/matrix

- usually degradable, porous



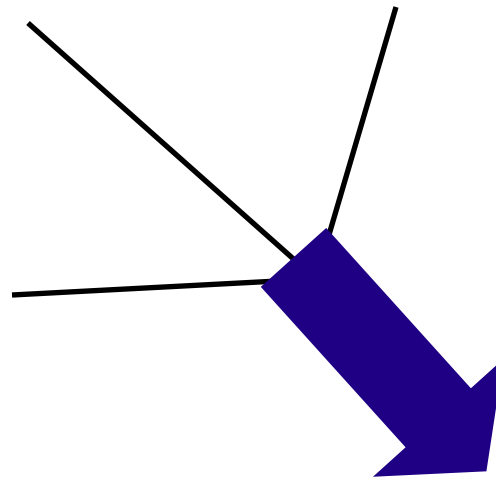
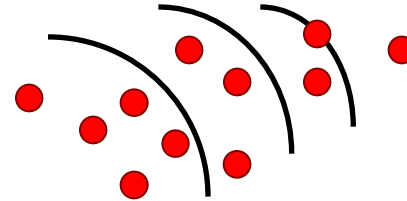
cells

- precursors and/or differentiated
- usually autologous

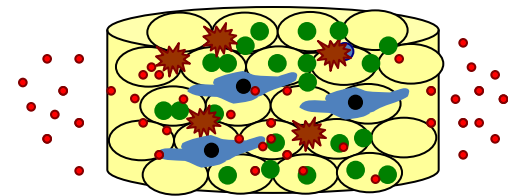


soluble factors

- made by cells or synthetic
- various release profiles



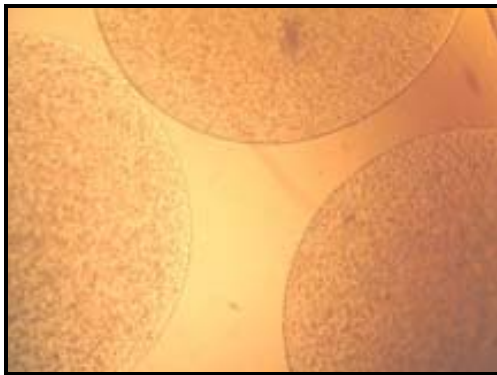
integrated implantable or injectable device



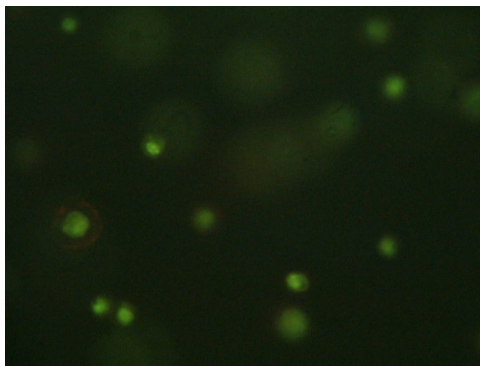
Module overview: lab

Day 1: design

Day 2: seed cultures



Day 3: viability assay

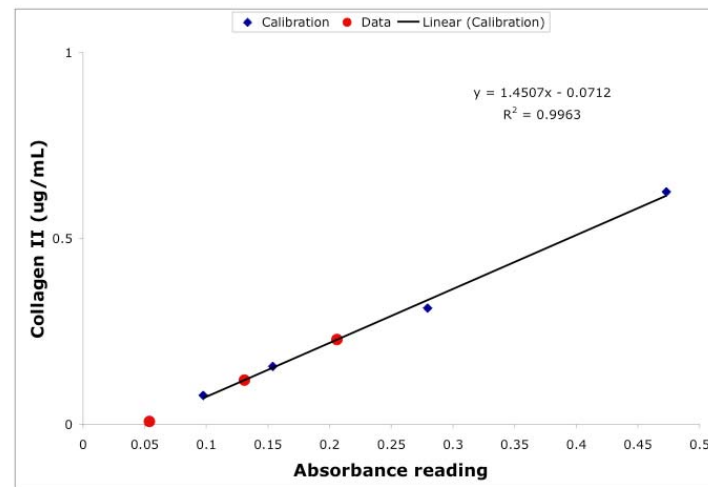
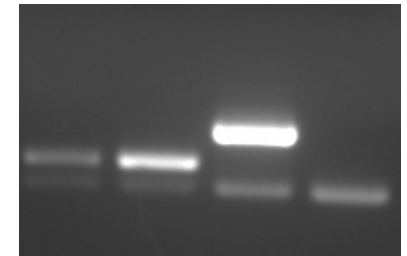


Day 4: prep RNA+cDNA

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: find typical alginate %, cell density, etc.
 - Skim results/discussion: summarize in 1-2 sentences
 - Goal: finding what you need (not deep/close reading)
- Make your own plan
 - Vary one parameter: simple or sophisticated
 - Check cell availability with teaching faculty
 - Request unique materials/equipment needed
 - Goal: choose an experiment goal, conceive design

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