Biological Frameworks for Engineers

ME 411 / ME 511

Biological Frameworks for Engineers

UNIVERSITY OF WASHINGTON

Class Organization

- HW4 due
- HW5 assigned. Due Wed Nov 14.
- Lab 3 – Muscle Lab
  - Wed Nov 14
  - MEB 127

Biological Frameworks for Engineers

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Integrating Cells into Tissue

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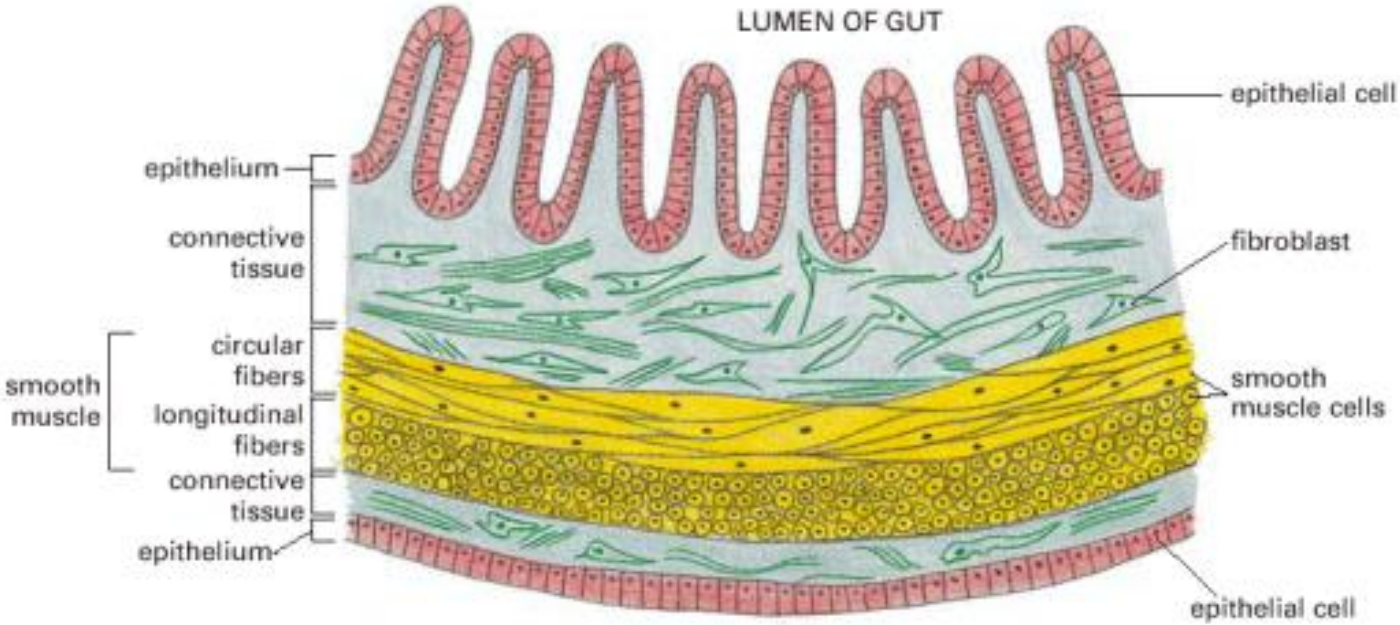
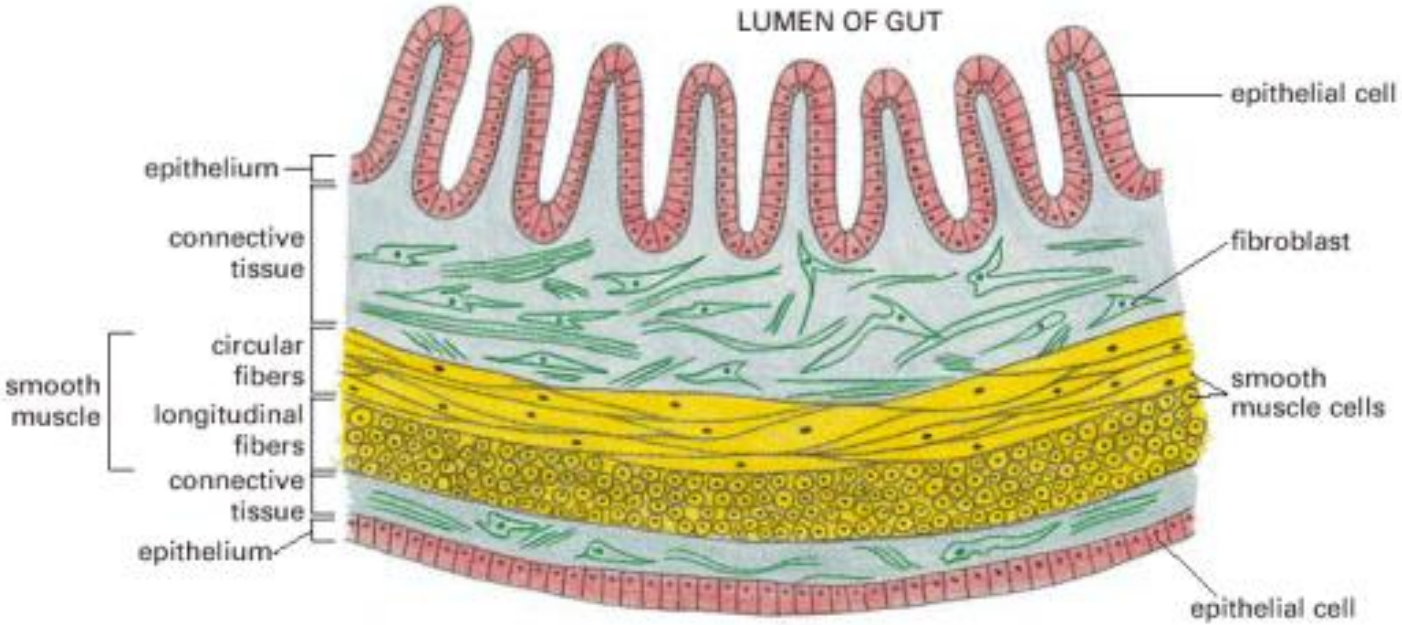
What is a Tissue?

- An association of cells of a multicellular organism.
- Common embryological origin or pathway.
- Similar structure and function.

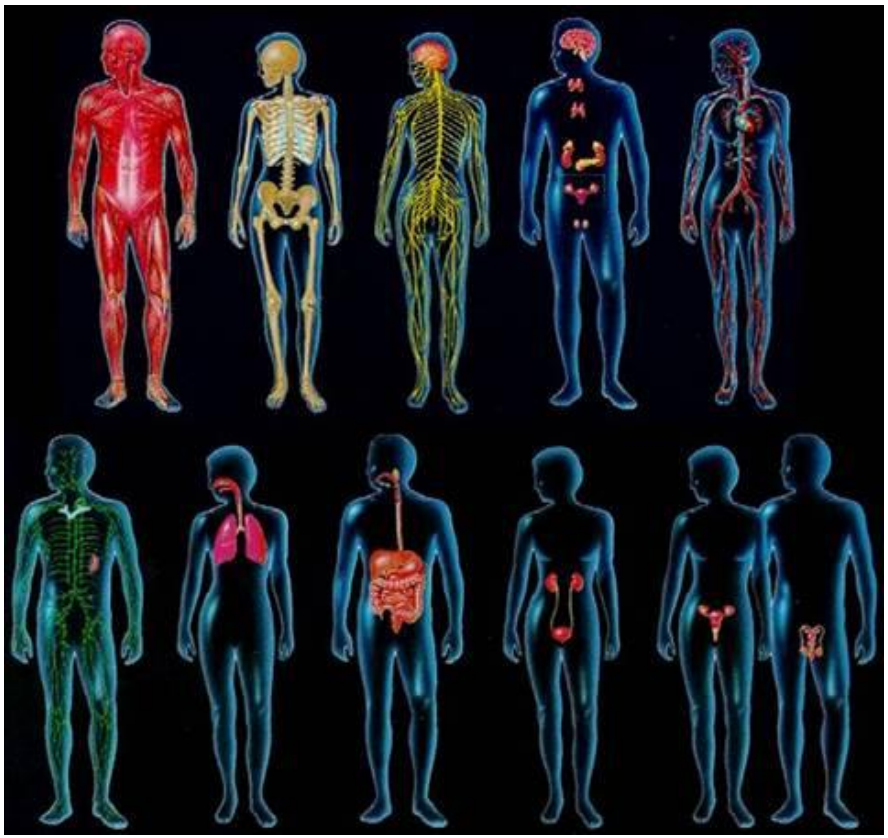


Examples & Jobs

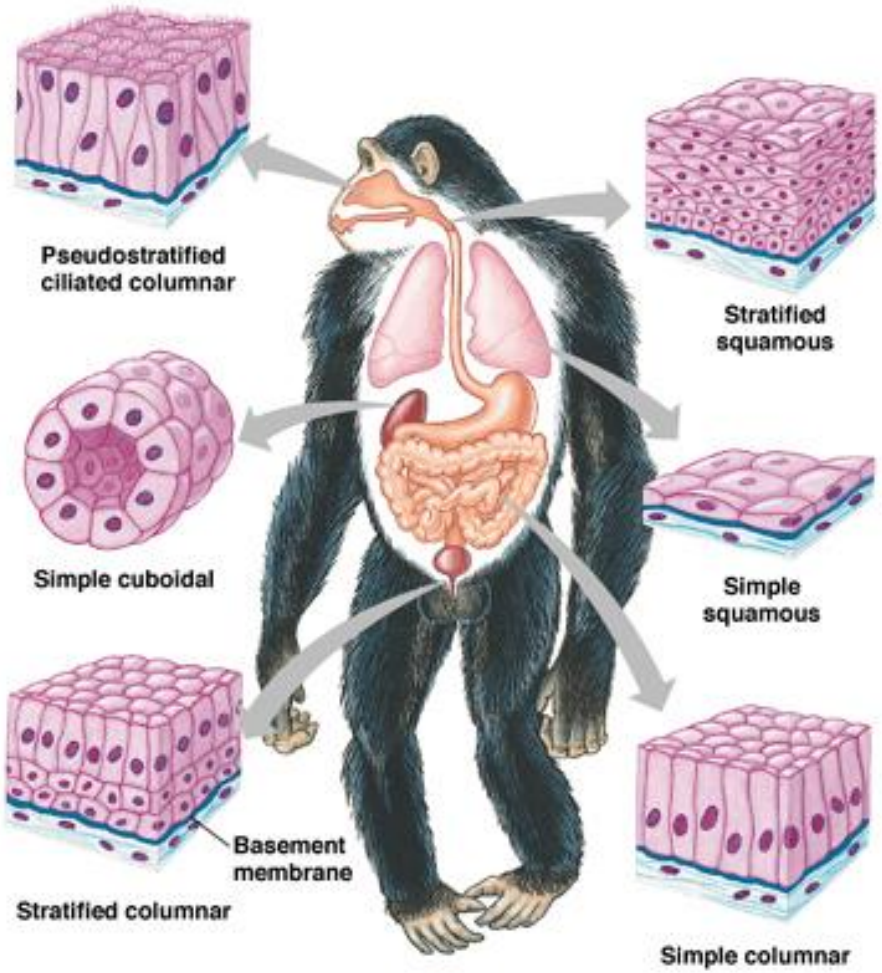
- Epithelium – barrier coating
- Connective Tissue – binds and supports other tissue
- Muscle – contraction



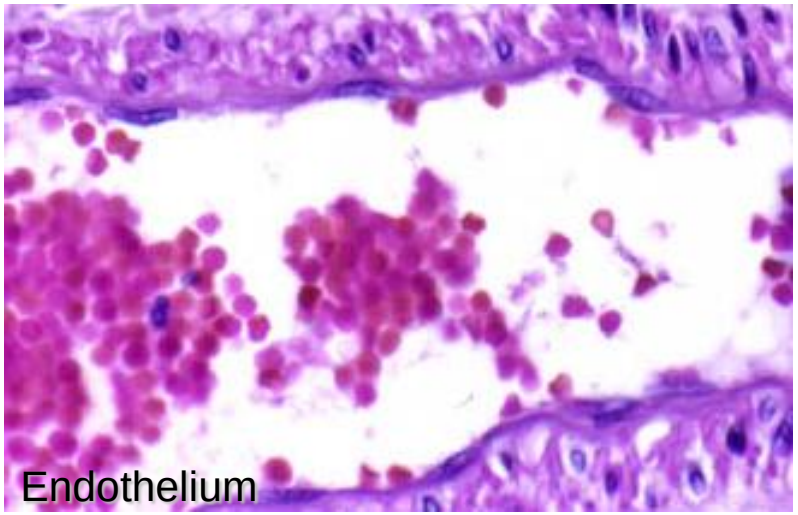
Division of Labor

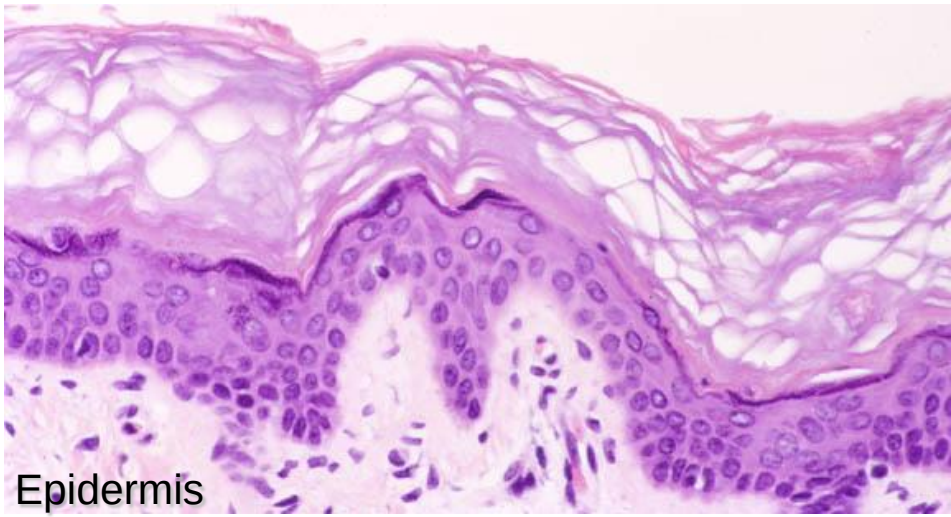


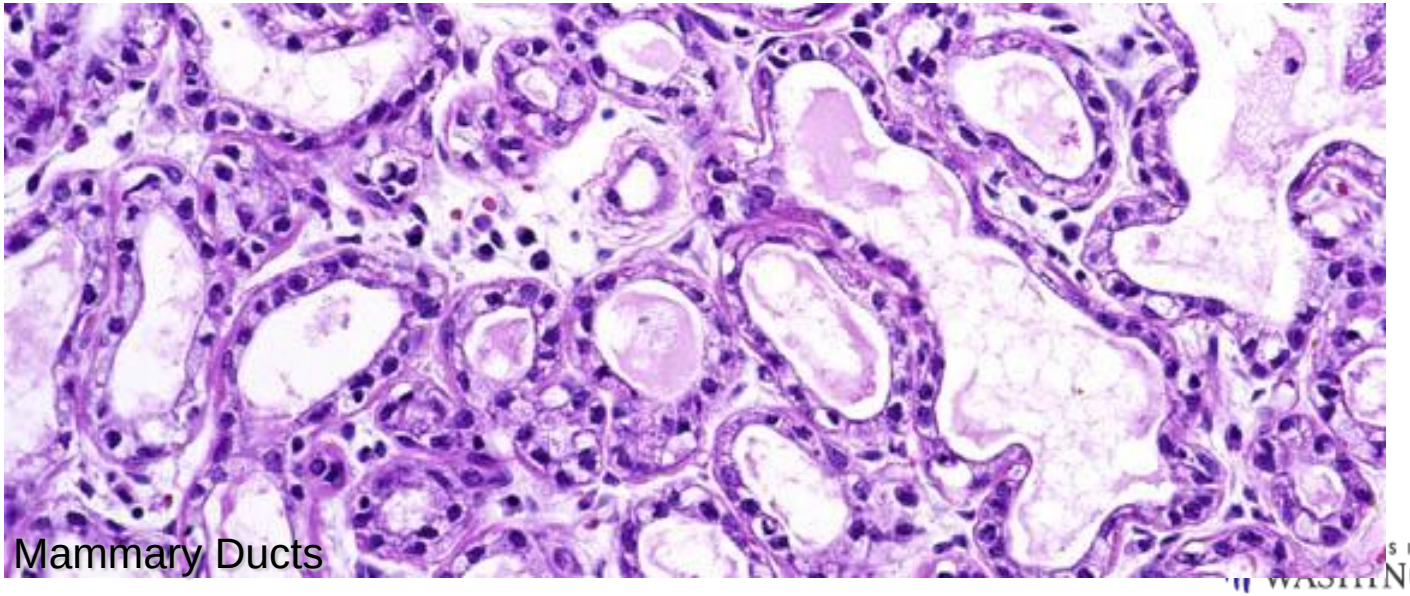
Epithelial Tissue



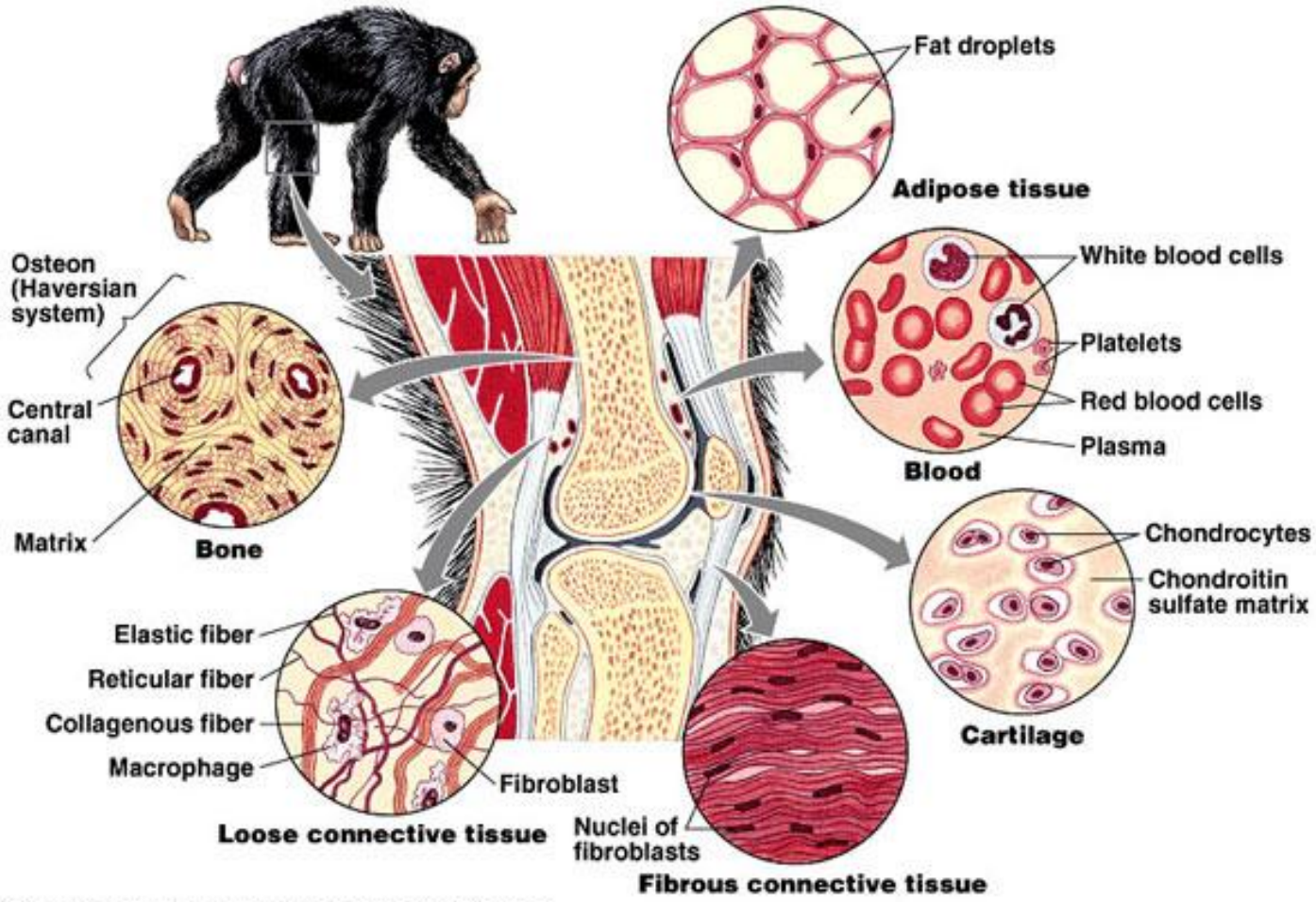
Epithelial Tissue


Endothelium

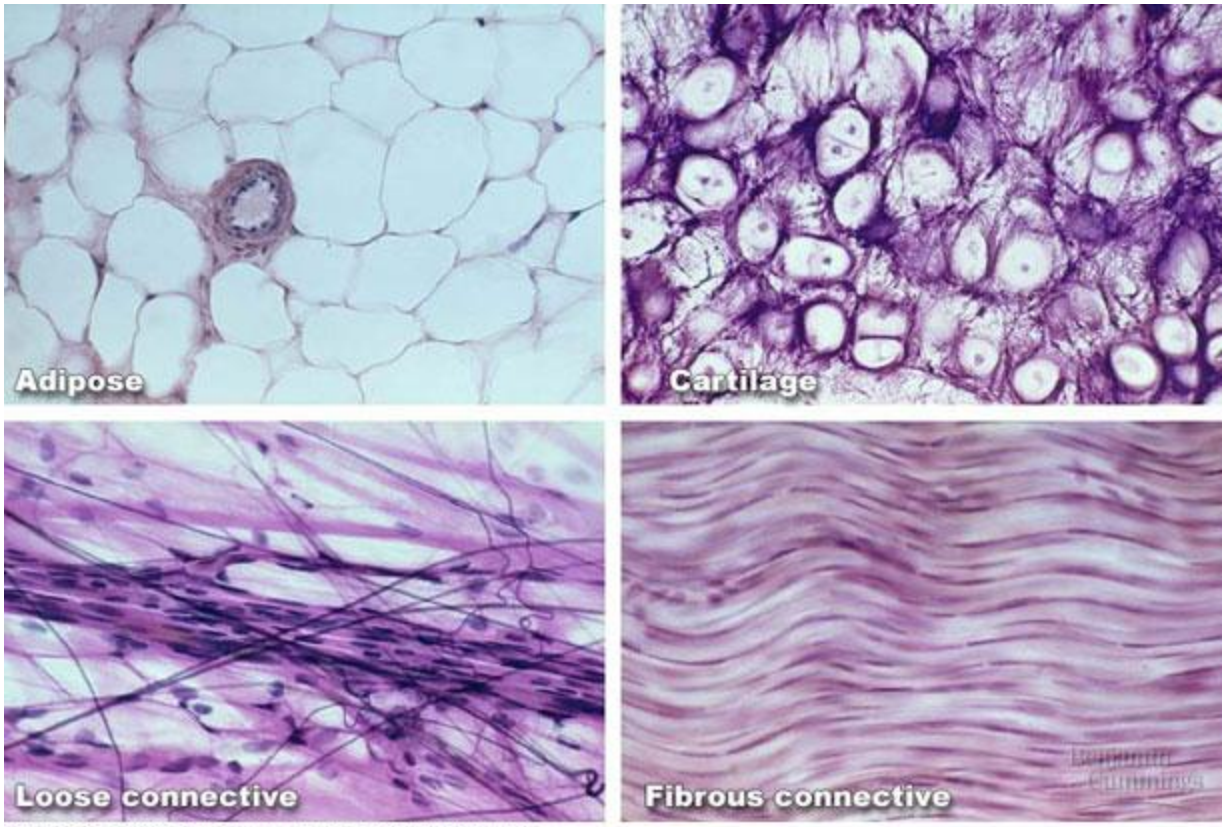

Epidermis


Mammary Ducts

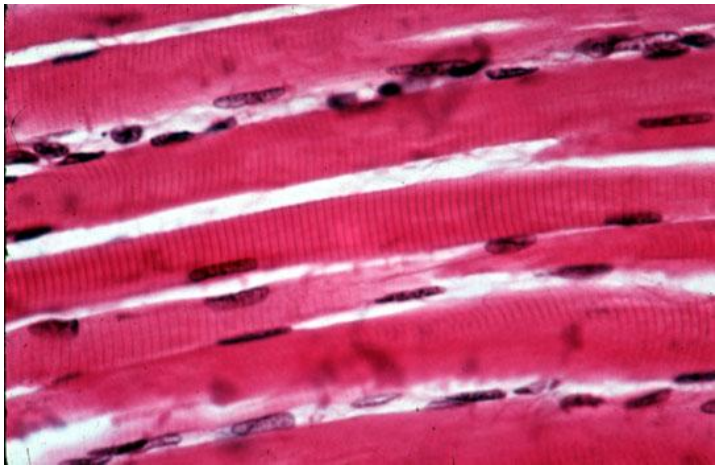
Connective Tissue

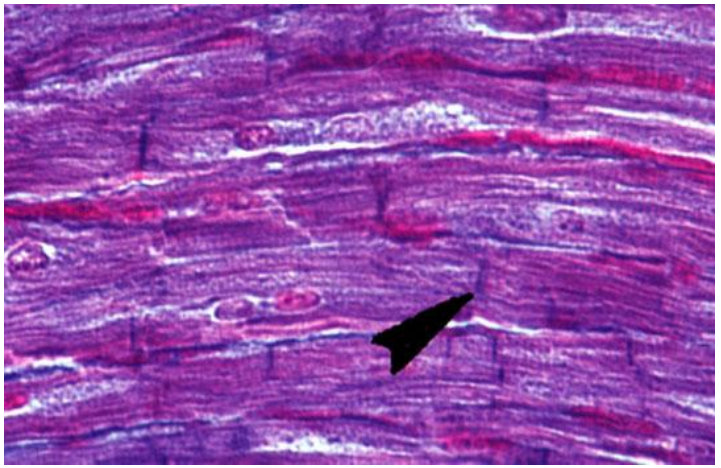


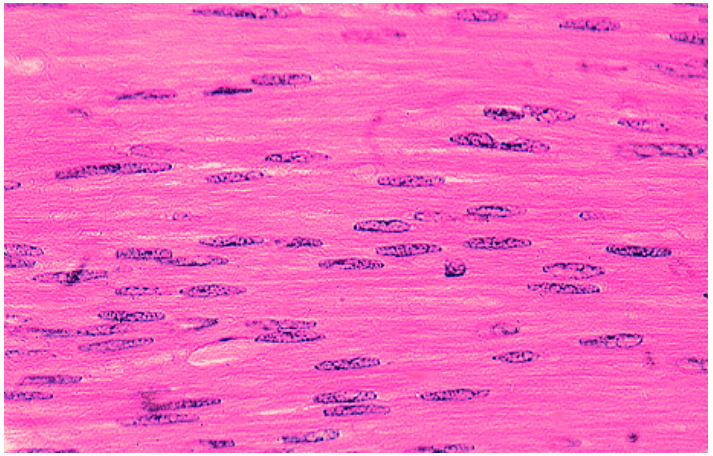
Connective Tissue

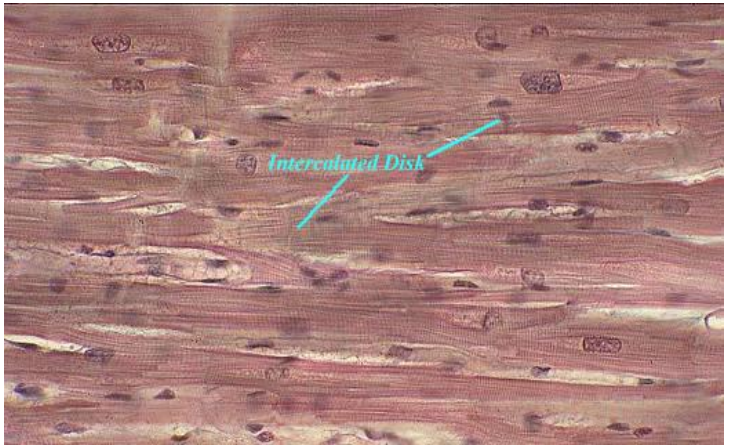


Muscle Tissue

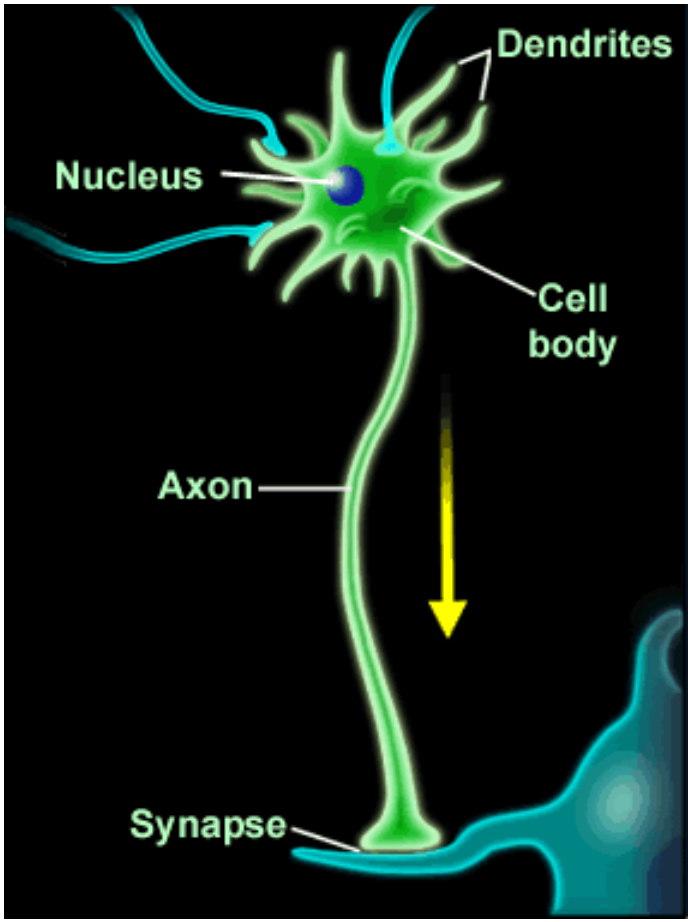




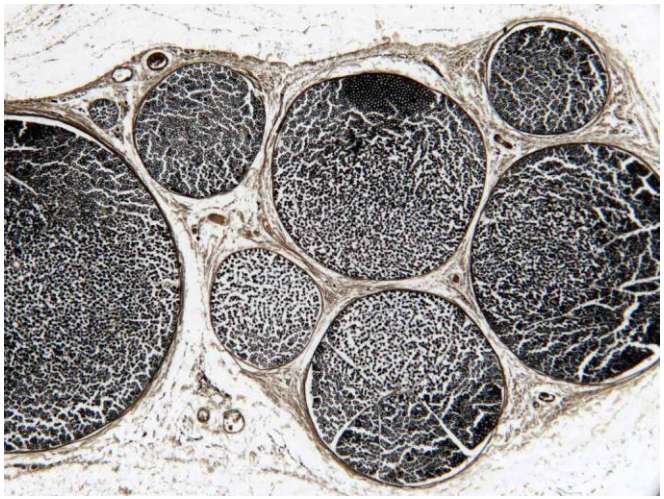


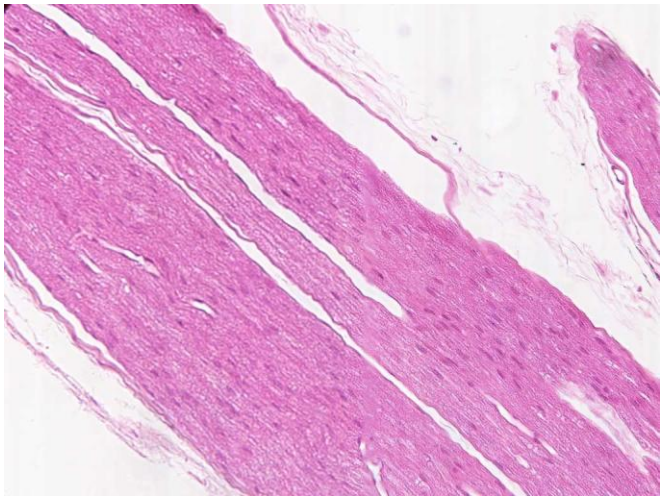


Neural Tissue

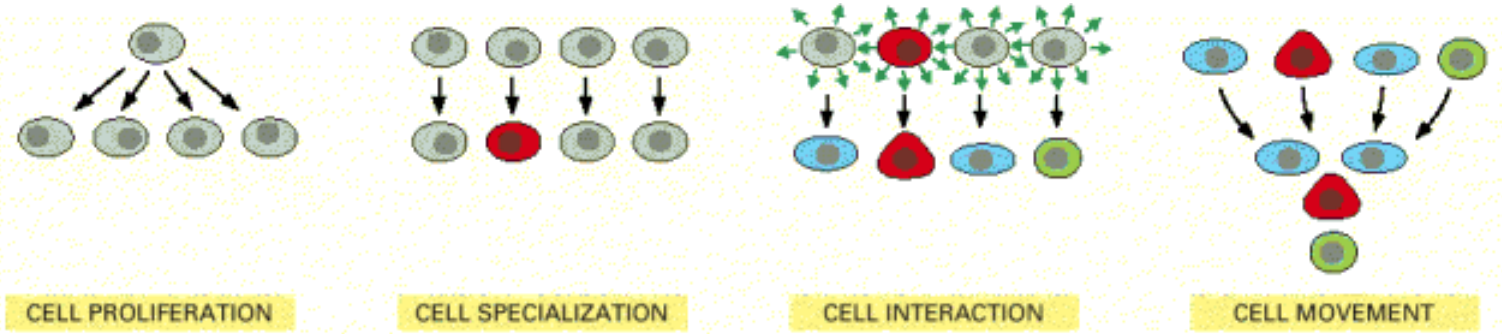


Neural Tissue





Tissue Development



Could a cell…

- alter the sequence of the gene coding for protein P?
- alter the concentration of RNA polymerase in the cell?
- alter RNA polymerase's access to the promoter of the gene coding for protein P?
- alter RNA polymerase's ability to move forward along the gene coding for protein P?
- alter the rate at which the mRNA coding for protein P exits the nucleus and enters the cytoplasm?
- alter the rate at which the mRNA coding for protein P is degraded?
- alter the concentration of ribosomes in the cell? alter the ribosomes' access to the ribosome binding site of the mRNA coding for protein P?
- alter the concentration of tRNA in the cell?
- alter the rate at which protein P is degraded by proteasomes?

Questions?