Week 6 Lecture 0

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1 Administrative drivel

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2 More on tissues...

- **Connective tissue/Extracellular matrix**
  - Usually connect things together
  - anything outside/in-between cells/organs – cels embedded in a non-celluar matrix
  - connection/integration, protection, and storage
  - Connectivity
    - e.g. tendons connect muscle to bone
  - Strength
    - e.g. the support of muscle tissue
  - Protection
    - e.g. bones protect tissue.
  - cells in connective tissue destroy einvading microrganisms (white blood cells)
    - Note: blood is a connective tissue! Blood cells are suspended in plasma, a non-cellular matrix!
  - common molecules in extra-cellular matrix: collagen, elastin
  - Ct/Ecm
    - Cells secrete proteins and carbohydrates that form the extracellular matrix
    - Structural and connection/communication between cells
    - **Bone** : Collagen proteins + minerals + [bone cells]
    - **Skin**: (beneath the cells) elastin and collagen proteins + various cells of the skin
    - Technically that blood and lymph system also are connective/extracellular tissues
  - clicker Q: The epithelial cells contribute to defense against infection, but **not** by destroying invading microorganisms
- Muscle tissue – contractile
  - 3 subtypes
  - **skeletal** type – moving limbs, etc – activate by nerve cells
    - we will meet these cells in more detail later
    - go from a long to a shorter condition (contraction), cannot push
    - this type is strong and generates large forces
    - fatigues quickly – rest interval required between use

  - **Cardiac** type – the heart has a specific type of muscle cell
    - they contract without the need of an external signal
    - only in the heart
    - have a different shape than the other 2 types
    - produces a modest amount of force to circulate blood
      - beats about once a second until you die
      - this requires tremendous endurance
  - **Smooth** type – layers in intestines, urinary systeme, reproductive organs
    - changes the length and diameter of tubes
    - one of the largest muscles in the body is the uterus!
    - has moderate endurance and produces more modest forces, and needs a rest interval

- Nervous tissue – excitable cells and supporting cells
  - sensing the environment
    - internal and external
      - internal is unconsious, this prevents us from going "nuts"
  - organizing the appropriate response
    - e.g. messages to leg muscles
  - made up of nerve cells that change their chemical composition to sent messages
  - Also keeps things ticking along (e.g. movement in the intestines)
  - we'll encounter these again later.

- tissues: multiple cells of the same type
- organ: multiple tissue types together to fulfill some function
  - Muscle + touch elastic coat + slippery inner lining + nerves = HEART :)
- organs make up organ systems!
  - e.g. Heart + arteries + veins + capillaries = Cardiovascular system!
    - arteries carry blood from the heart to parts of the body
    - veins carry blood from the extremities to the heart
    - capillaries carry blood throughout the tissues, carrying blood from the arteries to the veins.
      - all of the cells needed molecules are carried to them through the capillaries!
  - others: skeletomuscular, nervous, integumentary, lymphatic and immune, circulatory, repiratory, digestive, urinary, endocrine, reproductive
    - (might not cover the last few of these)
  - example: skin has all of the tissue types!
- all of the organ systems together make up an organism!

3 Organs