Cell Adhesion & the Extracellular Matrix:

- Cell adhesion: the ability of cells to stick together to form tissues & the ability to stick to their environment
  - cell adhesion occurs largely through proteins called cadherins & integrins
  - Cadherins stick cells together
  - Integrens stick cells to their env. or extracellular matrix
  - as a result cell adhesion is a complex set of interactions among cells, & b/t cells
    & the extracellular matrix that make for more complex interactions for cells to form tissues & ultimately organs
- Cadherins:
  - responsible for cell-to-cell adhesion, binding cells together to form tissues
  - cadherins are not a single protein, but a large family of diverse proteins
  - cadherins are synthesized as polypeptide chains & undergo many posttranslational modification to become the final proteins which mediate cell-to-cell adhesion & recognition
  - these polypeptides are approximately 720-750 amine ac 05 kerg, each cadherin has a small cytoplasmic component, a transmerring and component, & the majority of the protein is extrace lunar.
  - cadherins of the same type bind together at their extracellular domains so only cells that express the same type of cadherin can interact to bind together
  - cadhe and anchored on the ntracellular side to cytoskeletal proteins
- mtrg res. ransmembrand P of ity hat are the bridges for cell-extracellular matrix
  - (ECM) binding to stabilize cells in their "environment"
    - have 2 different chains, the alpha & beta subunits, & are obligate heterodimers (they only work in pairs of alpha & beta)
    - in mammals, there are 18 alpha & 8 beta subunits
    - integrins bind to the cytoskeleton on the intracellular side, & specific molecules in the ECM; the ECM molecule they bind to is dependent on which combo of alpha & beta are present
- Extracellular Matrix:
  - it is synthesized, secreted actively maintained environment & it is modified by many diff. kinds of cell
  - it is an insoluble meshwork composed of proteins & polysaccharides
  - there are many diff. forms of extracellular matrix, which differ in amount, type & organization of the proteins & polysaccharides that make them up
  - some of the major protein constituents of ECM fibronectin, vitronectin, elastin, collagen, & laminin
    - these interact w/ integrand to adhere these cells
  - Collagen: most abundant protein in mammals (25-35% of protein content of your body is collagen)
    - 90% of collagen is Type I- we know 28 types so far