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# The Cell

- I. Tools to Study the Cell
  - a. Compare/contrast prokaryotic with eukaryotic.
  - b. Microscopes
    - i. Light—structure and function; when do you use it?
    - ii. SEM—structure and function; when do you use it?
    - iii. TEM—structure and function; when do you use it?
  - c. Explain cell fractionation—how to and why.
  - d. Organelles—function
    - i. Cytoplasm—structure and function
    - ii. Plasma membrane—structure and function
    - iii. Nucleus—structure and function
      1. nuclear membrane—structure and function
      2. nuclear lamina—structure and function
      3. chromosomes—structure and function
      4. chromatin—structure and function
      5. nucleolus—structure and function
    - iv. Ribosomes—structure and function
    - v. Endomembrane system—structure and function
      1. vesicles—structure and function
      2. endoplasmic reticulum—structure and function
      3. RER—structure and function
      4. SER—structure and function
      5. glycoproteins—structure and function
      6. transport vesicles—structure and function
      7. Golgi apparatus—structure and function
      8. lysosomes—structure and function
      9. vacuoles—structure and function
      10. contractile vacuoles—structure and function
      11. tonoplast—structure and function
    - vi. mitochondria—structure and function
      1. cristae—structure and function
      2. mitochondrial matrix—structure and function
    - vii. peroxisome—structure and function
    - viii. chloroplast—structure and function
      1. plastids—structure and function

2. thylakoids—structure and function
3. granum—structure and function
4. stroma—structure and function
- ix. cytoskeleton—structure and function
  1. microtubules—structure and function
  2. microfilaments—actin—structure and function
  3. intermediate filaments—structure and function
  4. cilia—structure and function
  5. flagella—structure and function
  6. centrosome—structure and function
  7. centrioles—structure and function
  8. basal body—structure and function
  9. dynein—structure and function
  10. actin—structure and function
  11. myosin—structure and function
  12. pseudopodia—structure and function
    - a. cytoplasmic streaming—function
- x. cell wall—structure and function
  1. primary—structure and function
  2. secondary—structure and function
  3. middle lamella—structure and function
  4. extracellular matrix
    - a. collagen—function
    - b. proteoglycans—function
    - c. fibronectin—function
    - d. integrin—function
  5. intracellular junctions—function
    - a. plasmodesmata—function
    - b. tight junctions—function
    - c. desmosomes—function
    - d. gap junctions—function

e. Why are cells small?

What is the emergent property of cells?