PHARMACOKINETICS: Absorption (p.1)

Intro.: **"fully absorbed" drug**
- Crossing cell membranes (to reach RSs) through walls of the GI tract (PO route)
- Through capillary walls (endothelial cells)
- Past the blood-brain-barrier (BBB) (endothelial cells + astrocytes)
- Or placental barrier
- Miscel. Lungs, rectum, nasal mucosa, etc.

1. The **body's capillary walls**
   - endothelial cells, pores 40 to 90-150 angstrom units wide
   - blood proteins (e.g. albumin)
   - protein binding, a "protein" bound drug

2. **Cell membranes**
   - double layer of phospholipids molecules
   - hydrophobic, hydrophilic
   - lipophilic
   - protein molecules embedded in/piercing through membrane
     - structural, enzymes, pores, receptor sites (RSs)
   - semipermeable, molecule size & charge (valence)
     - filtration, passive diffusion, active transport

3. The **BBB**
   - brain's capillary walls
   - endothelial cells with "tight junctions"

4. The **placental barrier**
   - teratogens

5. **<u>Factors Affecting Absorption</u>**

a. **Solubility** (in water or oil medium)

b. **Ionization** (ionized vs. non-ionized forms)

c. **Polarity**

d. **pH** (acid 0 --- neutral 7 --- base/alkaline 14)
stomach acid – 1.2 pH, small intestine – 2.0,
large intestine – 6.6, urine – 4.5 – 8.0, blood – 7.4
most drugs – 5 to 9

acidic drug in alkaline medium --- ionize
acidic drug in acidic medium --- do not ionize
alkaline drug in alkaline medium --- do not ionize
alkaline drug in acidic medium --- ionize

e. "**ion trapping**"
morphine 8.0, dopamine 9.0, amphetamines 10.0