

Exam 3

Receptor Characteristics

- **Activation:** ligand binds
 - Based on shape and charge
- **Specificity:** limited binding
- **Affinity:** strength of binding
- **Saturation:** % activated
- Competition
 - **Antagonist:** no response
 - **Agonist:** response
 - Giving them signals, that will either stop or activate a signaling pathway
 - As ways to alter communication
- Activation converts signal (ligand, messenger) into response (change in physiology)
 - = Signal transduction pathway
- Possible responses
 - Change in membrane
 - Ex: phone call/stranger/ change in entry of the house happens
 - Alter metabolism
 - Change contractile activity (shape)

- Secrete Product (receives one endocrine and releases another as a result)
 - Change proliferation (create one that looks exactly the same) or differentiation (change to being generic and change to be specific) rate
- Locations (types)
 - Based on location where we find the receptor
 - 1. **Intracellular**: within cytosol or nucleus
 - inside the cell/ behind membrane/barrier
 - 2. **Membrane Bound** -sitting on surface of the cell
- Intracellular
 - W/in nucleus or cytosol
 - Ligand needs to be able to come across barrier on its own (nonpolar/small) to move across
 - FIGURE 5-4 .
 - Nonpolar (if endocrine) does not like to be hanging out in polar environment
 - Needs plasma binding protein
 - Ex: submarine - us underwater , versus us in air bubbles
 - Binding protein = amphipathic
 - Doesn't matter where receptor is , ligand/whatever bound to receptor in nucleus
 - Complex in nucleus: interact with DNA, cannot do outside in cytosol
 - Result= always alters DNA use (up or down)
- Membrane Bound- FIGURE 5-5
 - Always going to be an integral or transmembrane protein
 - Ligand= polar (no entry)

- Only 1st in relay (2nd+)
- o Four categories
 - 1. Receptor functions as ion channel
 - Result= in charge of distribution
 - 2. Receptors Function as enzyme (tyrosine kinase)—
kinase is enzyme that does are equation #1, tyrosine = amino acid
 - Result= cascade of phosphorylation's
 - 3. Receptors interact with JAK kinase (eq#1)
 - Result= synthesis of new proteins
 - 4. Receptor interact with a G protein (acting as middle man) (**HETEROTRIMETRIC**)
 - Alpha, Gamma, Beta = subunits (3 parts)
 - Most common
 - Alpha subunit with GTP
 - Plasma membrane effector protein (PMEP)
 - Two different
 - 1) **ion channel**: interacting with alpha subunit. GTP → transferred PMEPP
 - o ion channel= opens
 - 2) **enzyme**
 - o ex: adenylyl cyclase
 - o FIGURE 5-6
 - Enzymatic function = takes ATP and turns it into a circle type cAMP
 - cAMP=Activates a kinase and breaks down ATP, ADP, Pi,