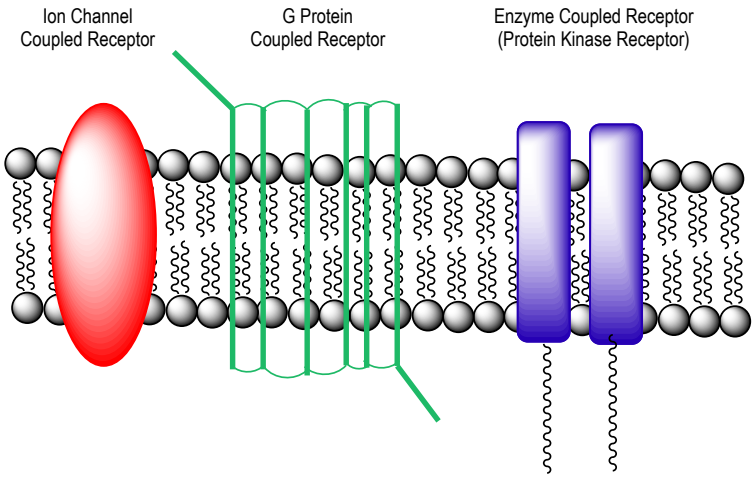
CONCEPT: OVERVIEW OF CELL SURFACE RECEPTORS

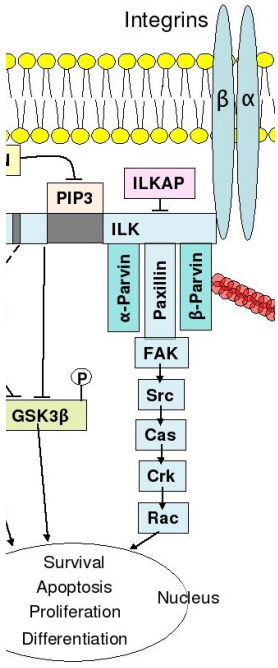
- There are three types of cell surface _____
  - □ **Ion channel coupled receptors** produce and respond to different electrical gradients stemming from ions
    - Can also convert chemical signals into electrical signals (Ex: neuronal signaling)
  - □ **G-protein coupled receptors** activate G proteins in the cytosol
    - G proteins then act on enzymes or ion channels to cause signaling cascades
  - □ **Enzyme coupled receptors (protein kinase receptors)** act as enzymes, usually in a receptor complex
    - C-terminal domain contains enzymatic characteristics

EXAMPLE: Three types of cell surface receptors



- Commonalities exist between the three main receptors and their _____ pathways
  - □ Usually, these receptors are activated by binding to a ligand
    - If the ligand remains for long time periods the cell responds by down-regulating (removing) the receptor
  - □ Protein kinases (add phosphates) and phosphatases (remove phosphates) are involved downstream of activation
  - □ **Second messengers** are molecules that act to sign _____ of the receptor/ligand binding
    - Make up **signal transduction pathways** which is the collection of stepwise signaling events
    - The final step to a signal transduction pathway is usually activation or inhibition of a transcription factor

EXAMPLE: Example of a signal transduction pathway



PRACTICE:

1. Which of the following is not a type of cell surface receptors?
    a. Ion Channel Receptors
    b. G-Protein Coupled Receptors
    c. Signal Coupled Receptors
    d. Enzyme Coupled Receptors

2. Which of the following receptors responds to an electrical gradient across a membrane?
    a. Ion Channel Receptors
    b. G-Protein Coupled Receptors
    c. Signal Coupled Receptors
    d. Enzyme Coupled Receptors