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Receptor tyrosin kinase

- **Second major class** of cell surface receptor.
- **Ligands:** Soluble or membrane bound proteins/peptides **(NGF, FGF, PDGF, EGF and insulin).**
- **Functions:** Regulation of cell proliferation, differentiation, cell survival, modulation of cellular metabolism.

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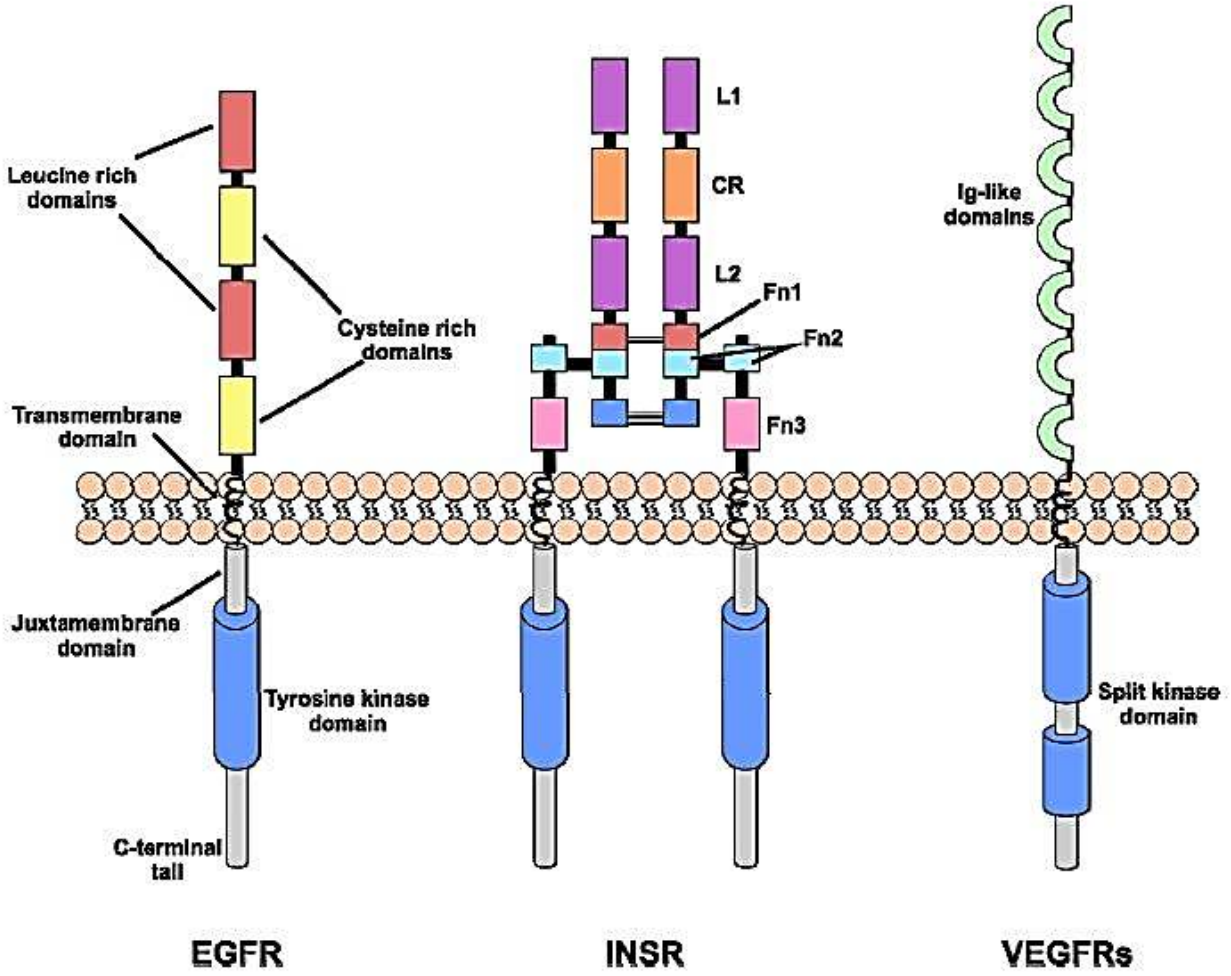
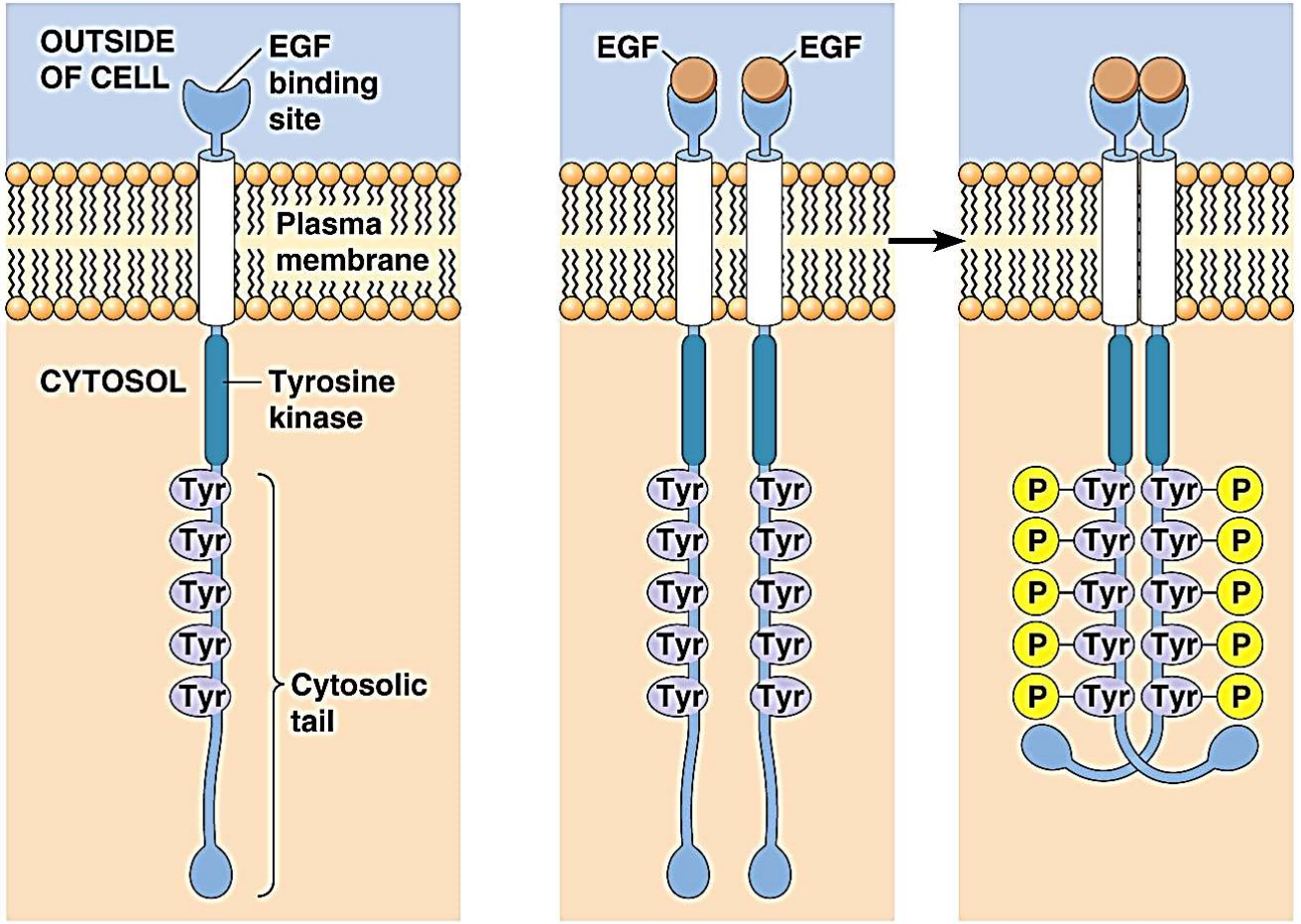
RTK: Structure



Receptor Dimerization and Autophosphorylation



(a) Structure of the epidermal growth factor (EGF) receptor

(b) Activation of the EGF receptor

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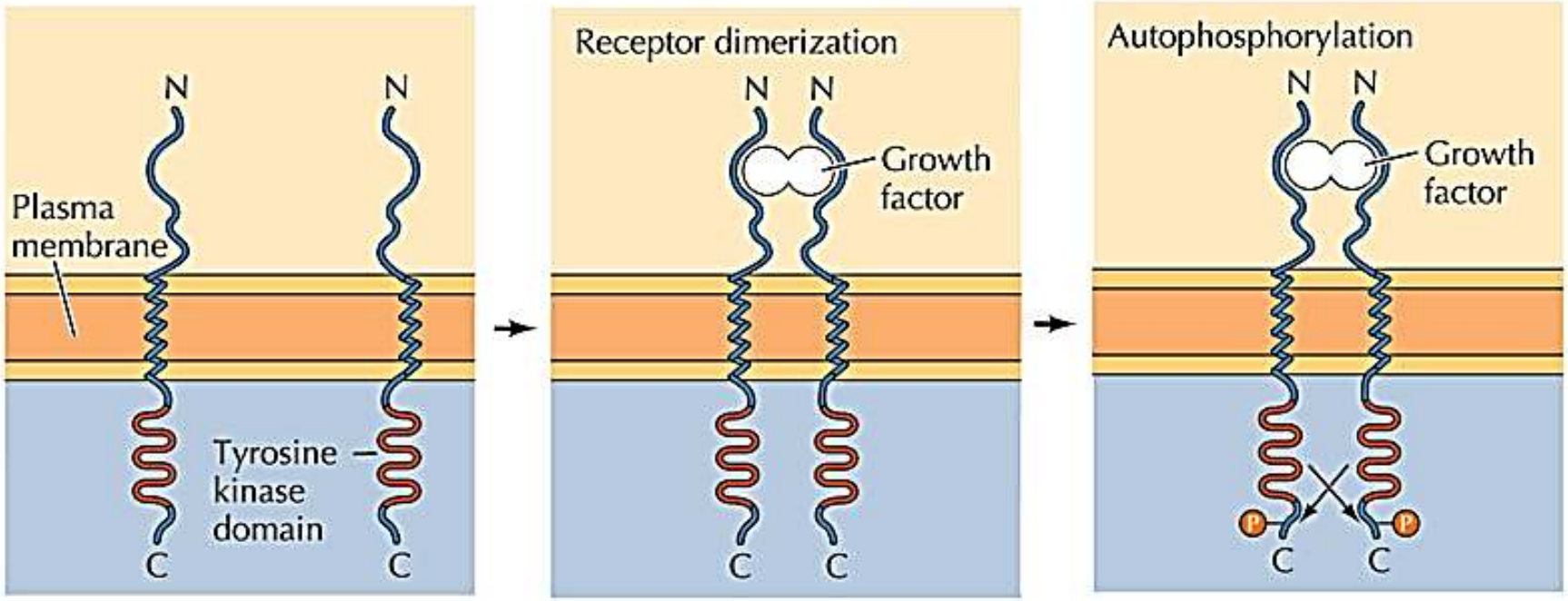

RTK: Function

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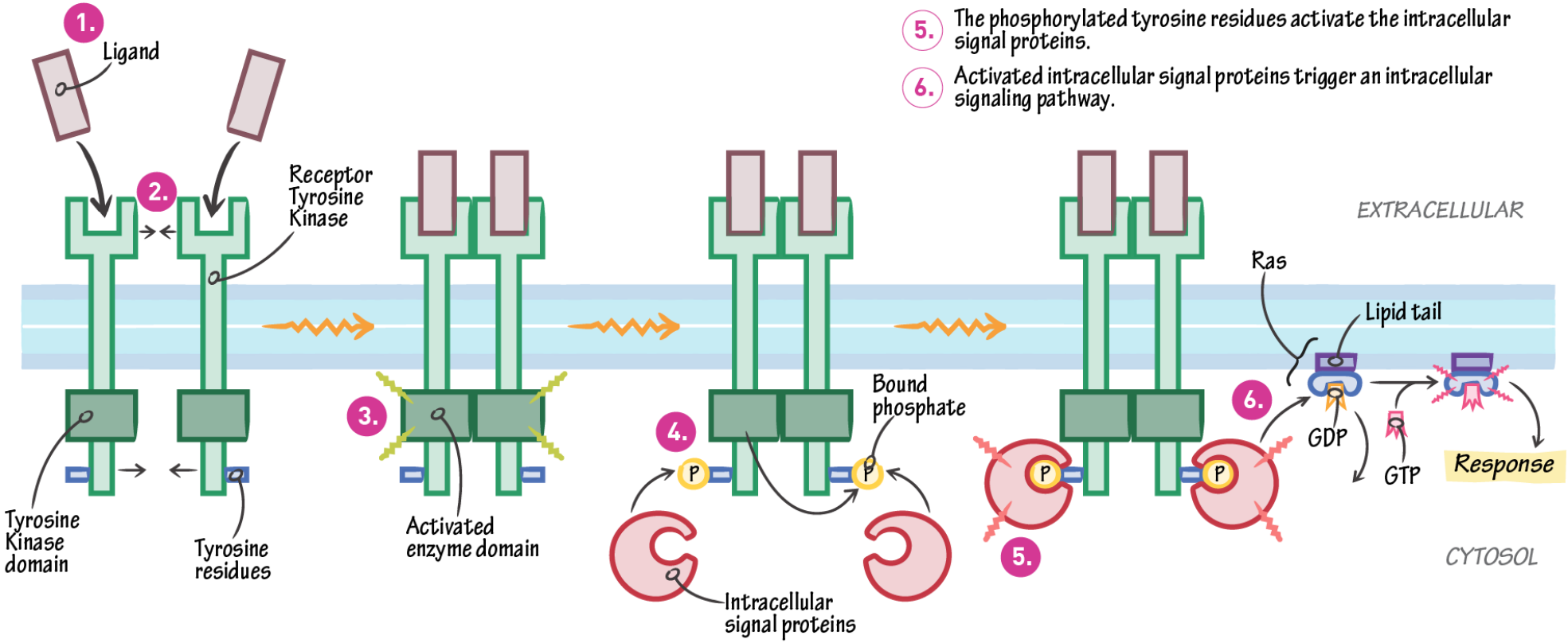
RECEPTOR TYROSINE KINASES

Key Concepts

- ✓ Enzymes that add phosphate to tyrosine residues
- ✓ Largest of the enzyme-coupled receptor class of cellular receptors
- ✓ One transmembrane segment
- ✓ Can activate multiple signal pathways

1. Ligands bind the receptor.
2. Receptors join and dimerize.
3. Dimerization causes the tyrosine kinase domains to become activated.
4. Receptor phosphorylates the opposite tyrosine residue.
5. The phosphorylated tyrosine residues activate the intracellular signal proteins.
6. Activated intracellular signal proteins trigger an intracellular signaling pathway.



Adaptor proteins: Grb2 and Sos and SH2 domain

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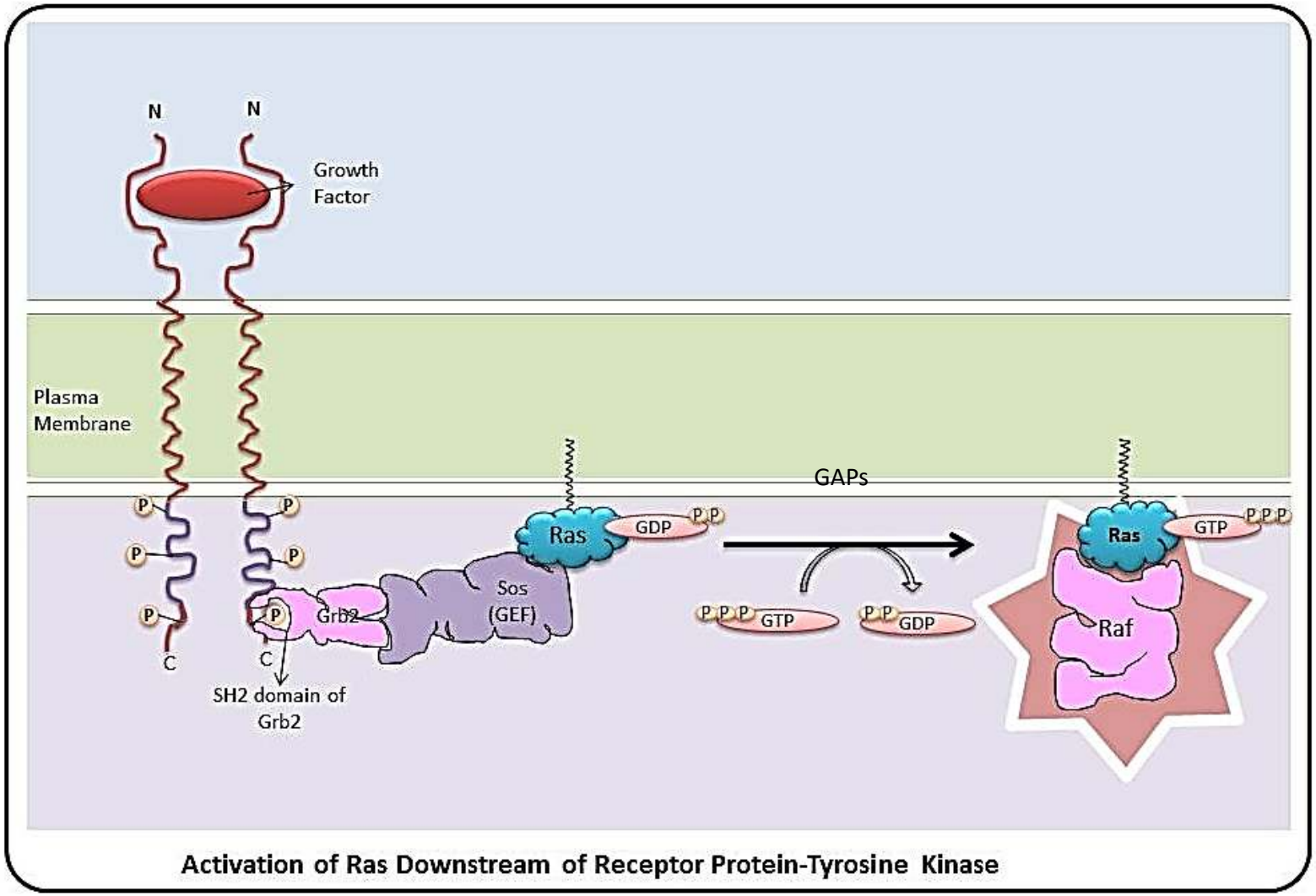
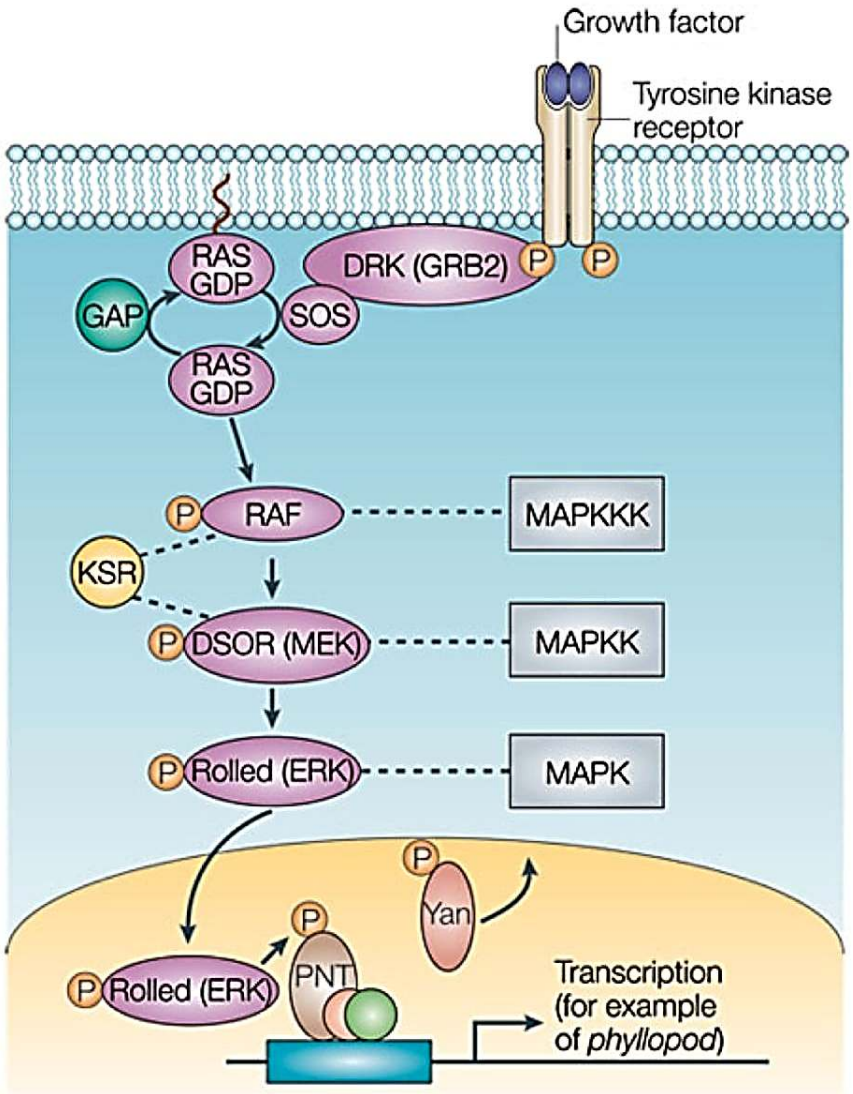


RTK and MAPK pathway



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Insulin Receptor And Function