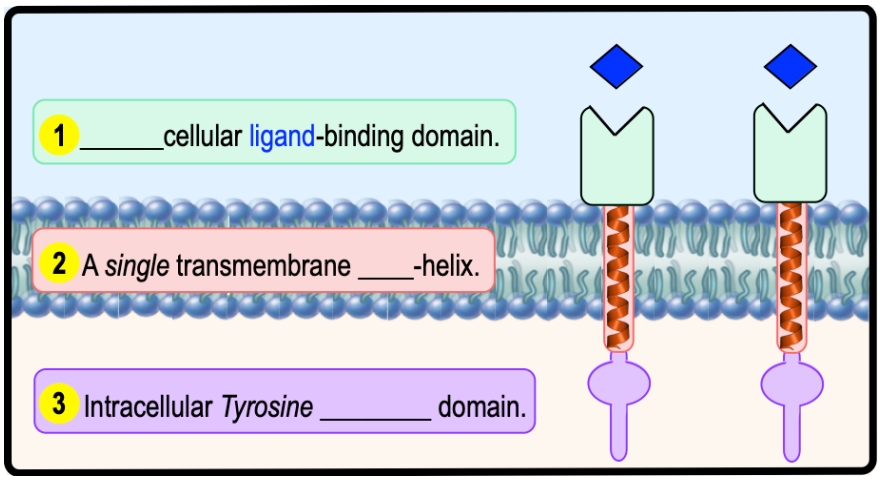
CONCEPT: RECEPTOR TYROSINE KINASES

●***R****eceptor* ***T****yrosine* ***K****inase* (_____): a _____ with an intracellular *Tyrosine* (*Tyr*) _____ domain.

□ *Tyrosine Kinases*: enzymes that _____ *Tyr* residues on specific target proteins.

3 Domains of RTK Monomers



Dimerization & Autophosphorylation of RTKs

●Several RTK classes show they can & usually exist as *monomers*, but always form _____ when *activated*.

1 *Ligand Binding*: _____ molecule binds to RTK.

2 *Dimerization*: a *conformational change* causes _____ RTKs to _____ (if not already dimerized).

□ *Ligand-binding* &/or *RTK dimerization* _____ *activates* both *Tyr kinase* domains.

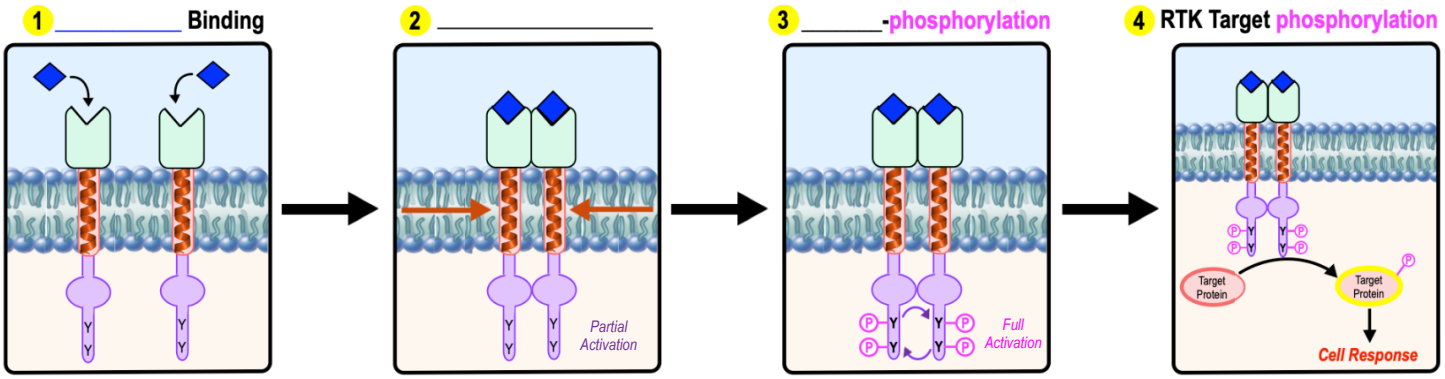
3 *Auto-phosphorylation*: *partial activation* allows Tyr kinase domains to _____-*phosphorylate* each other.

□ Leads to _____ *activation* of Tyr kinase domains.

4 RTK Phosphorylates Targets: autophosphorylated RTK can phosphorylate other _____ proteins.

□ *Cascade* of phosphorylation results in *changes to metabolism & gene expression* → Cell _____.

EXAMPLE: RTK Dimerization & Autophosphorylation.



CONCEPT: RECEPTOR TYROSINE KINASES

PRACTICE: Which of the following statements is NOT true of receptor tyrosine kinases?

a) Monomeric receptors are often induced to dimerize upon ligand binding.

b) The activated receptors attract and activate G proteins to continue the GPCR signaling pathway.

c) The cytoplasmic side of RTKs contains a kinase enzyme domain that is partially activated upon ligand binding.

d) Activated RTKs autophosphorylate themselves and can attract proteins with SH2 domains.

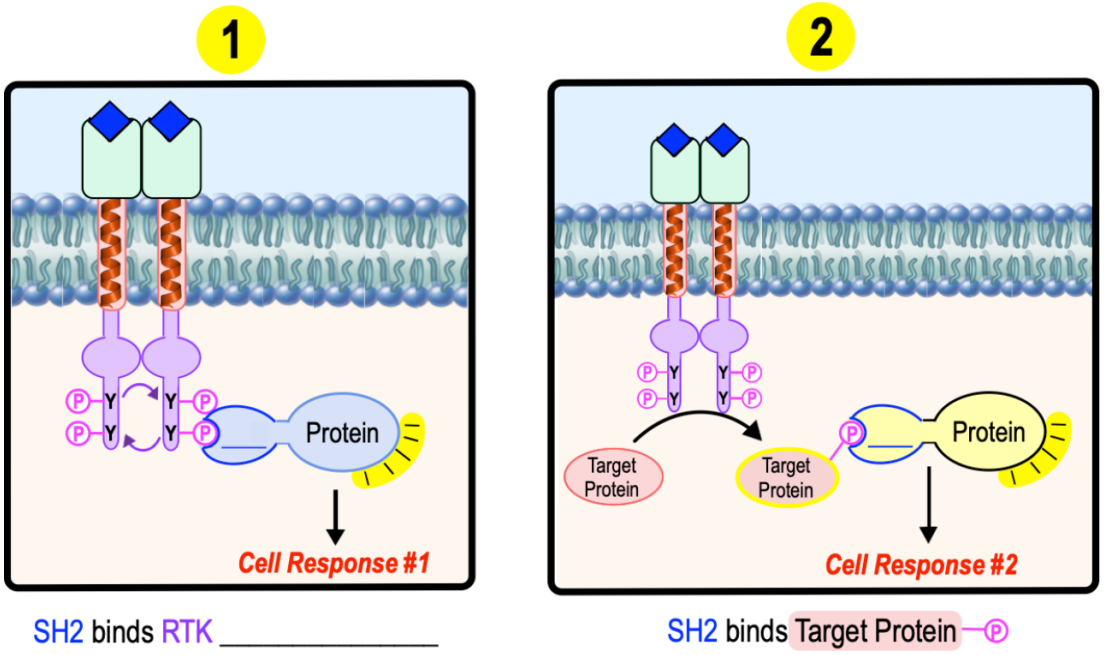
SH2 Domains Bind Phosphorylated Tyr

●Proteins with a ***S****rc* ***H****omology* ***2*** (_____) domain directly _____ *phosphorylated* _____ residues.

□ NOTE: SH2 domains do _____ bind phosphorylated Ser/Thr residues (only phosphorylated Tyr).

□ SH2 can either bind directly to (1) *autophosphorylated RTK* or (2) *phosphorylated target proteins*.

●Proteins with SH2 domains can have a wide _____ of functions, allowing RTKs to elicit a *variety* of cell responses.



SH2 binds RTK _____ SH2 binds Target Protein Ⓟ

PRACTICE: Proteins that contain a src homology 2 domain (SH2 domain):

a) Have a phosphoserine residue that causes them to bind to other proteins.

b) Have a phosphotyrosine residue that causes them to bind to other proteins.

c) Bind to any proteins that have a phosphothreonine group.

d) Bind to proteins that have a phosphotyrosine residue and a specific conformation.

e) Binds to proteins that have 2 sulfhydryl groups.