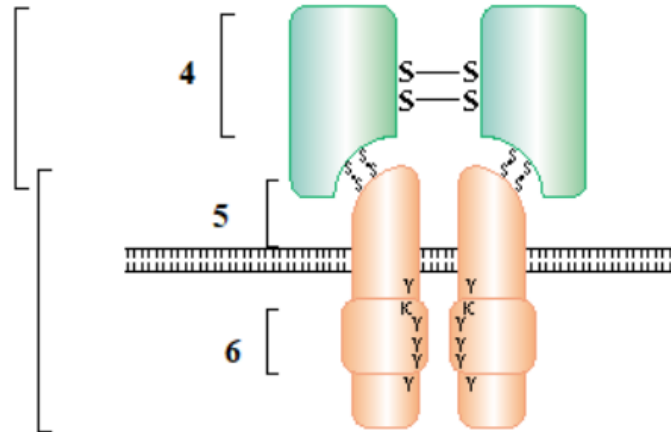


TD 2: RECEPTORS

Exercise 1

- Identify the receptor shown in the diagram below. To which class of receptors does it belong?
- Label the figure.
- What is the ligand of this receptor, and what is its chemical nature?
- What biological response results from activation of this receptor? Which molecule has the opposite effect?



Exercise 2: Multiple-Choice Questions

1. Which property prevents ligands of cell-surface receptors from entering the cell?
 - A. The molecules bind to the extracellular domain.
 - B. The molecules are hydrophilic and cannot pass through the hydrophobic interior of the plasma membrane.
 - C. The molecules are attached to transport proteins that carry them through the bloodstream to target cells.
 - D. The ligands can enter the membrane and directly influence gene expression when they bind to the receptor.
2. Why are ion channels necessary for transporting ions into or out of a cell?
 - A. Ions are too large to diffuse across the membrane.
 - B. Ions are charged particles and cannot diffuse through the hydrophobic interior of the membrane.
 - C. Ions do not need ion channels to cross the membrane.
 - D. Ions bind to carrier proteins in the blood, which must be removed before they can be transported into the cell.

TD 2: RECEPTORS

Exercise 2: Multiple-Choice Questions (continued)

3. Which property allows the amino-acid residues serine, threonine, and tyrosine to be phosphorylated?
- A. They are polar.
 - B. They are non-polar.
 - C. They contain a hydroxyl group.
 - D. They occur more frequently in the amino-acid sequences of signaling proteins.
4. The GABA receptor is a:
- A. Cation channel
 - B. Anion channel

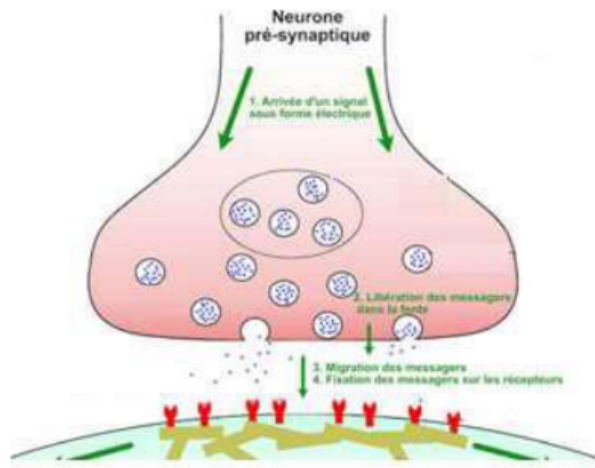
Exercise 3

1. The same second messengers are used in many different cells, yet the responses to these second messengers differ from one cell to another. How is this possible?
2. What is the function of a phosphatase?
3. What is the effect of an inhibitor that binds to an enzyme?
4. What are the differences between intracellular receptors and cell-surface receptors?

Exercise 4

The diagram below shows signal transmission from a neuron to a muscle cell.

1. Where does this transmission take place? Is it slow or fast?
2. Name the ligand–receptor complex formed during this signaling process.
3. What is the response to this signal? Briefly explain its mechanism.
4. After binding, the signaling molecule is rapidly broken down by an enzyme. Which enzyme is responsible, and why?



English translation of the supplied French worksheet. Original scientific diagrams retained.