

# Checklist (HL)

## Higher level (HL)

### What you should know

After studying this subtopic you should be able to:

- Define the term ligand.
- Outline the stages of signal transduction.
- Explain the mechanism of quorum sensing in bacteria and discuss its role in bacterial behaviour.
- Understand bioluminescence and its importance and applications.
- Identify the categories of signalling chemicals in animals — hormones, neurotransmitters, cytokines and calcium ions.
- Differentiate between different types of signals used by multicellular organisms.
- Describe the difference in structure and function of hormones and neurotransmitters.
- Demonstrate an understanding of mechanisms that signalling molecules use to produce localised as well as distant effects.
- Analyse the role of signalling molecules in the transmission of signals from one part of the body to another.
- Compare and contrast transmembrane receptors and intracellular receptors.
- Describe the different signalling pathways activated by transmembrane receptors and intracellular receptors.
- Explain the mechanisms of initiation of signal transduction pathways.
- Compare and contrast different types of transmembrane receptors and their mechanisms of action, including neurotransmitter receptors and G protein-coupled receptors.
- Analyse the role of transmembrane receptors in changing membrane potential and activating intracellular signalling pathways. Use the protein hormone insulin as an example.
- Describe the effects of oestradiol and progesterone on target cells.
- Explain that positive feedback amplifies the response.

- Explain that negative feedback dampens or inhibits the signalling response.
- Explain that a balance of both positive and negative feedback is necessary for proper cellular response.