**8** **(a)** When the water supply to a plant is reduced, the concentration of abscisic acid (ABA) in the leaves increases.

ABA binds to receptors in the cell surface membranes of guard cells. This triggers a series of events in the cells, which results in stomatal closure.

Fig. 8.1 is a diagram of part of a guard cell showing some of the events that occur when ABA binds to its receptor.

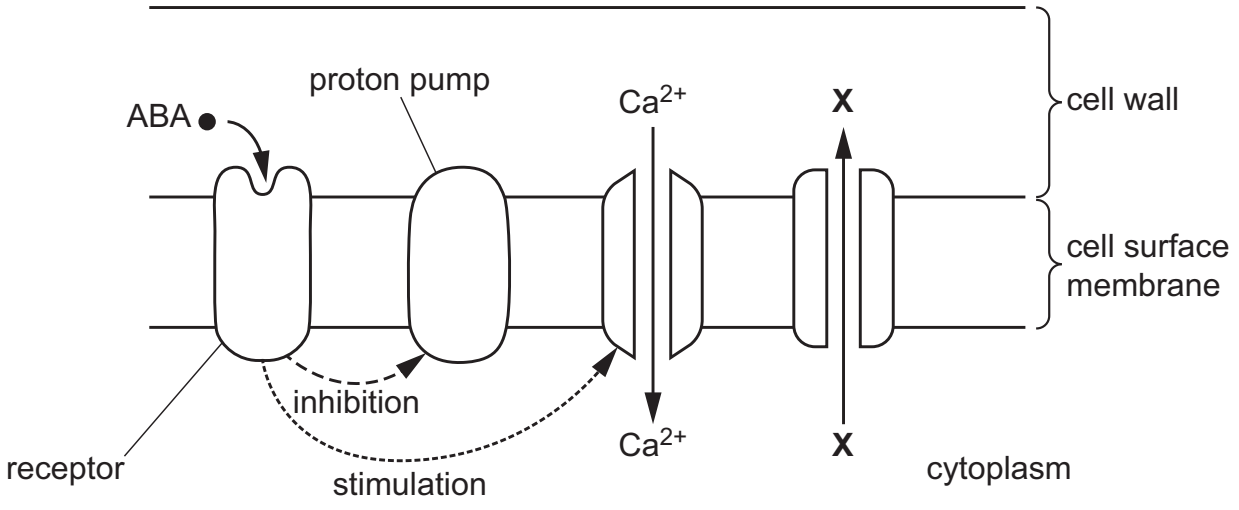


**Fig. 8.1**

Fig. 8.1 shows that calcium ions are involved in the events within a guard cell that result in stomatal closure.

Outline the role of calcium ions in the response of the guard cell to a reduced water supply **and** explain how this response results in stomatal closure.

Identify **X** in your answer.

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**(b)** Explain, using examples, why the homeostatic control involving the opening and closing of stomata is important for the efficient functioning of plants.

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[Total: 8]