AP Bio FRQ Fridays

2015 #5
Phototropism

NOTES

FRQ Friday #28

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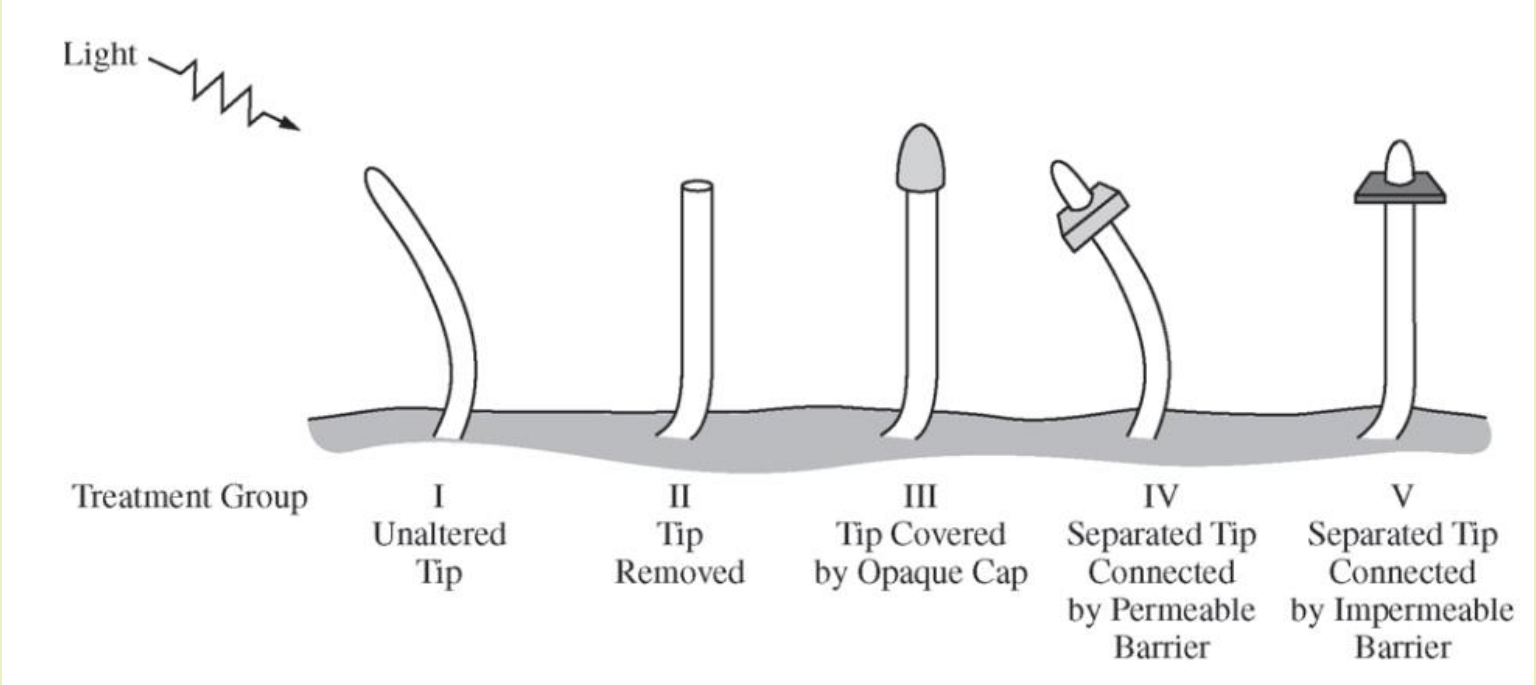

Phototropism in plants is a response in which a plant shoot grows toward a light source. The results of five different experimental treatments from classic investigations of phototropism are shown above.

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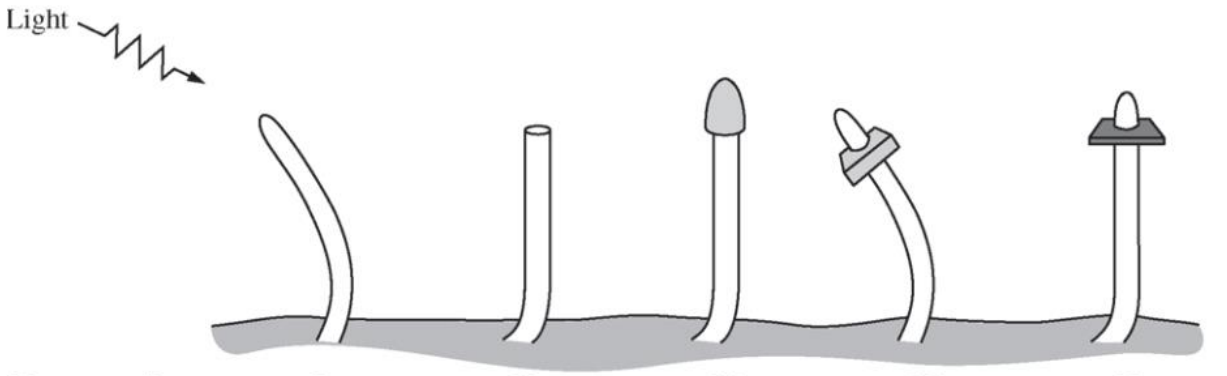
(a) **Give support** for the claim that the cells located in the tip of the plant shoot detect the light by comparing the results from treatment group I with the results from treatment group II and treatment group III.



Support (2 points maximum)

- In treatment II the tip is removed and the plant no longer bends toward light.
- In treatment III the cap blocks the light to the tip and the plant no longer bends toward light.

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- In treatment III the cap blocks the light to the tip and the plant no longer bends toward light.

a) The plant with the unaltered tip grew towards the light but the plant with the tip removed did not showing that only the tip and not the entire stem will respond to light and grow towards it. Even when the tip cells are not removed completely and the tip is covered so it is not exposed to light, the plant does not grow towards the light. This shows that the tip itself must be exposed to light in order for the plant to grow towards it.

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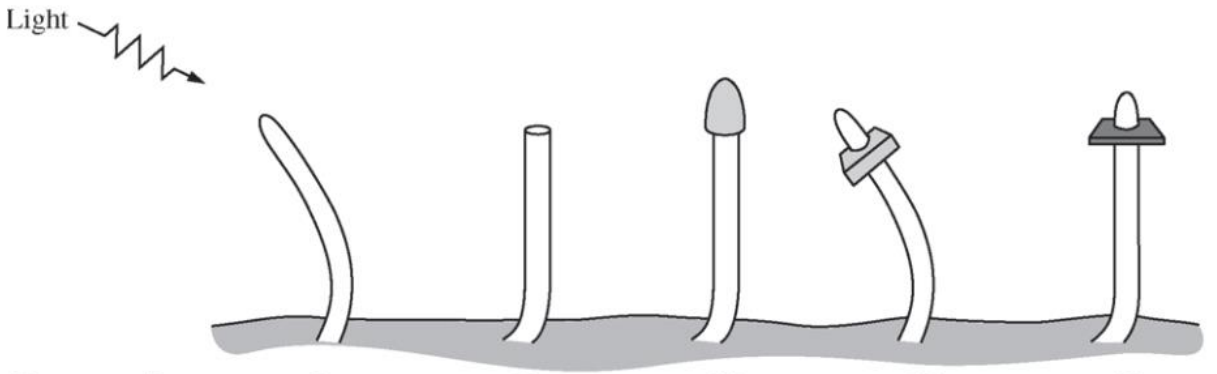
(b) In treatment groups IV and V, the tips of the plants are removed and placed back onto the shoot on either a permeable or impermeable barrier. Using the results from treatment groups IV and V, **describe** TWO additional characteristics of the phototropism response.



Description (2 points maximum)

- Tip produces a substance/signal/hormone (auxin) in response to light causing the plants to bend
- Substance must diffuse from the tip causing the plants to bend

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(b) In treatment groups IV and V, the tips of the plants are removed and placed back onto the shoot on either a permeable or impermeable barrier. Using the results from treatment groups IV and V, **describe** TWO additional characteristics of the phototropism response.

Description (2 points maximum)

- Tip produces a substance/signal/hormone (auxin) in response to light causing the plants to bend
- Substance must diffuse from the tip causing the plants to bend

b) The tip sends the signal to the rest of the plant to grow towards th light. In group IV, the signal can be passed through the barrier so the plant grows towards th light. In group V, the tip is unable to pass the signal to the rest of the plant so it does not grow towards the light. This shows that growth of a plant in response to light does not just occur at the tip, but occurs at the entire stem.