1 Many processes in the human body are controlled by hormones.

Details of some of these hormones are shown in the table.

(a) Complete the table by writing in the blank boxes.

Hormone	Where hormone is released	Function of hormone
ADH		increases the permeability of kidney tubules
	pituitary gland	controls the growth of long bones
progesterone	ovaries	
FSH	pituitary gland	

[4]

(b) Some people have a condition which means they do **not** release enough ADH.

Suggest what effects this might have.

.....

.....

..... **[2]**

2 Mady is investigating how light affects seedlings.

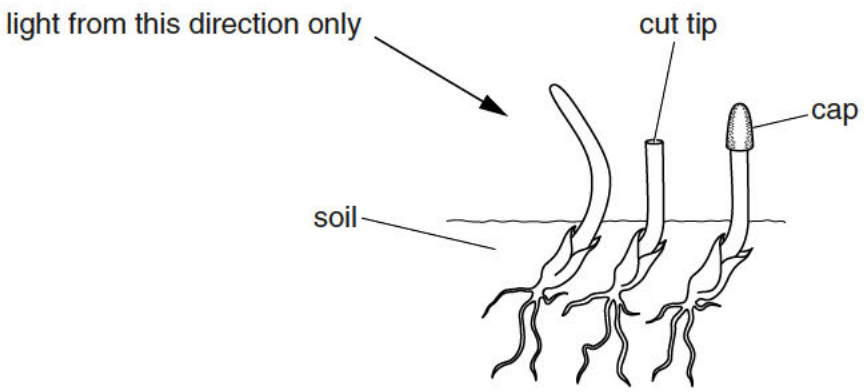
She allows the first seedling to grow normally.

She cuts off the tip of the second seedling.

She puts a light-proof cap over the tip of the third seedling.

Mady then leaves all three seedlings to grow with light shining from one direction only.

Look at the picture showing her results.



seedling

(a) Mady writes down some statements about her results.

Put ticks (✓) in the boxes next to the **two** correct statements.

Only seedlings 1 and 2 are showing positive geotropism.	☐
Only seedling 1 is showing positive phototropism.	☐
All the seedlings are responding to gravity.	☐
Only seedling 3 is showing negative phototropism.	☐
None of the seedlings are responding to light.	☐
None of the seedlings are showing negative phototropism.	☐

[2]

(b) The differences between seedlings 1 and 2 are due to a plant hormone.

Explain why they grew differently.

.....

.....

.....

.....

..... **[3]**

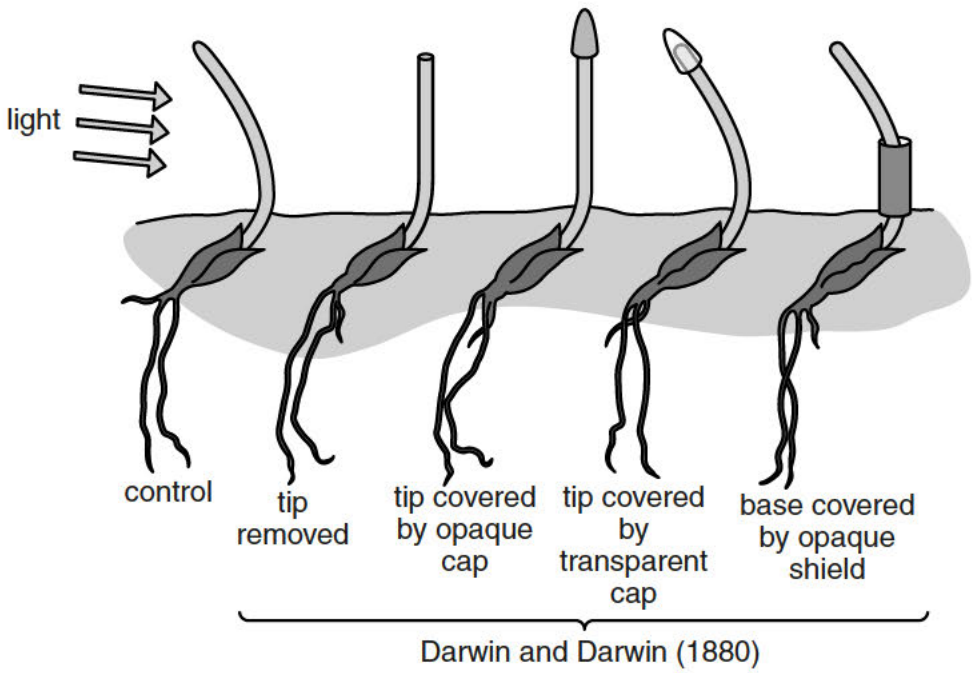
[Total: 5]

3 This question is about phototropism.

(a) Look at the diagram.

It shows the results obtained by Charles Darwin and his son in 1880.

Their results led to the discovery of a group of plant hormones called auxins and their effect on plant growth.



Darwin and Darwin (1880)

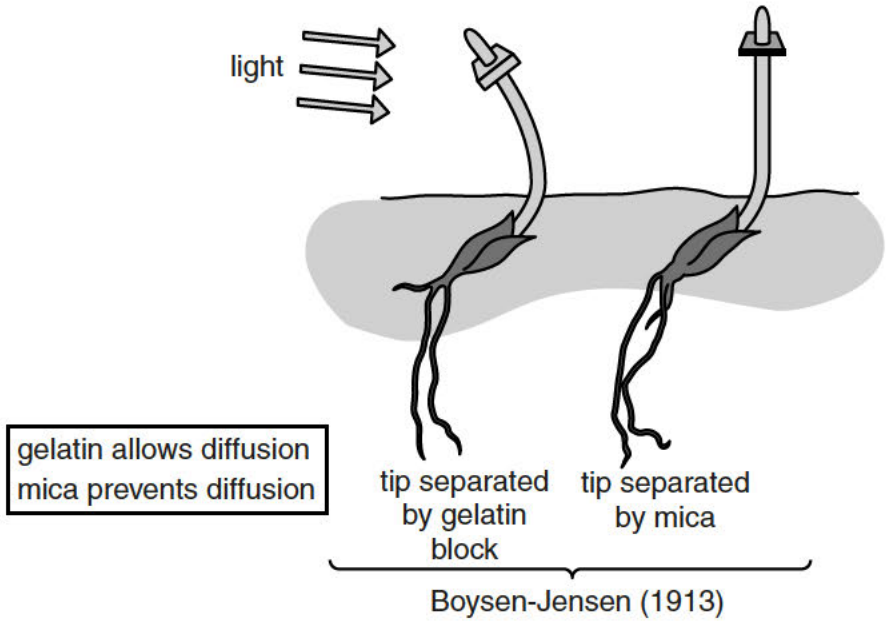
Explain how these results show **where** auxin is made.

.....

..... **[1]**

(b) In 1913, Boysen-Jensen also investigated phototropism.

The diagram shows his results.



Explain how these results show **how** auxin moves.

.....

..... **[1]**

(c) Explain what both sets of results show about the link between the distribution of auxin and cell elongation.

.....

..... **[1]**

[Total: 3]

4 Dicky is visiting the hospital to have his heart checked.

(a) Dicky runs to the hospital because he is worried about being late for his appointment.



The doctor must wait until the level of a hormone in Dicky's blood returns to normal before he checks Dicky's heart.

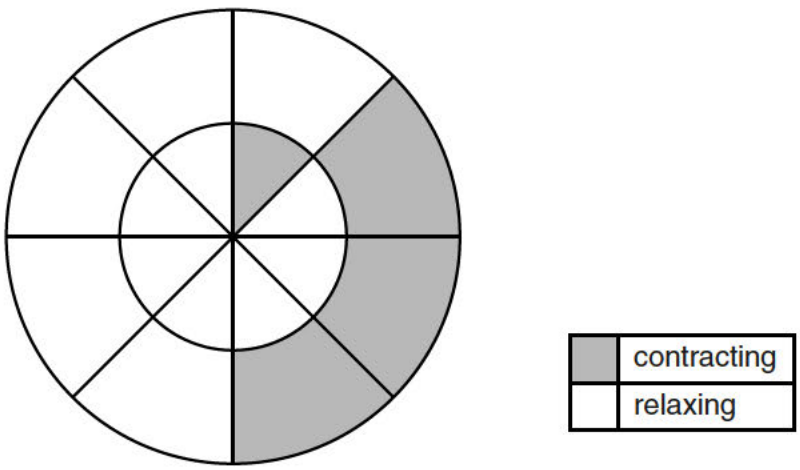
Write down the name of this hormone.

..... **[1]**

(b) The doctor produces this diagram showing one complete cycle of Dicky's heart.

The inner circle shows what is happening in the atria and the outer circle shows what is happening in the ventricles.

The whole cycle lasts for 0.64 seconds.



(i) For how long do the atria contract during one cycle of Dicky's heart?

answer ..... seconds **[1]**

(ii) The longer a contraction lasts, the greater the pressure that can be generated by the heart.

Explain how and why the contraction time of the ventricles is different from the contraction time for the atria.

.....

.....

..... [2]