Chromosomal DNA - It floats free in the cytoplasm and controls cell activity and replication

Plasmid DNA - Small loops of extra DNA that contains drug resistance and could be passed between bacteria.

Cell membrane - Controls what enters and leaves the cell

Ribosomes - Where proteins are made

Flagella - Hair-like structure that rotates like a propellor to make the bacterium move

1.2 Describe how specialised cells are adapted to their function, including:

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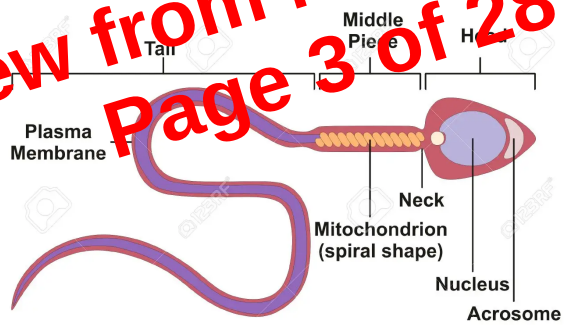
a) sperm cells – acrosome, haploid nucleus, mitochondria and tail



Acrosome - This bursts releasing enzymes that digest a pathway through the jelly-like layer surrounding the egg cell.

Haploid nucleus- It has half the number of chromosomes so diploid number is restored after fertilisation

Mitochondria - Releases a lot of energy so it can swim to the egg

Tail - Moves from side to side so the sperm can swim to the egg.

in the shape of the active site.

At high temperatures the enzyme denatures and so the active site changes shape. The substrate can no longer bind into the active site of the enzyme easily meaning that fewer enzyme substrate complexes are formed. The reaction slows down or even stops as there are fewer enzyme-substrate complexes and so fewer products are released.

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1.9 Explain the effects of temperature, substrate concentration and pH on enzyme activity

Temperature:

- **As the temperature increases the rate of reaction increases. This is because the substrate molecules and enzyme molecules gain more kinetic energy and so there are more successful collisions resulting in more enzyme substrate complexes and so more products are released.**

- **Optimum temperatures = The temperature at which the enzyme works at the fastest rate.**

- **Beyond the optimum temperature the rate of reaction**

decreases. This is because the enzyme is denatured. Shape of active site changes - substrate can no longer fit so easily - fewer enzyme-substrate complexes - rate slows or stops.

pH

- Below or beyond the optimum pH the rate of reaction slows down. This is because the enzyme is denatured and the shape of the active site changes and so the substrate can no longer fit so easily forming fewer enzyme-substrate complexes. So the rate of reaction either slows down or even stops.

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Substrate Concentration

- As the substrate concentration increases, the rate of reaction increases. This is because there are more successful collisions per second. -Higher concentration

- Lower concentration = slower rate of reaction, few enzyme and substrate collisions per second.

- At a certain point the rate of reaction remains constant as it is a horizontal line. This is because all the active sites are full.

1.10 Core Practical: Investigate the effect of pH on enzyme activity

1) Place one drop of iodine solution to each well of the spotting tile.

2) Take 3 test tubes. -

Measure out 2cm^3 of starch solution
Measure out 2cm^3 of amylase solution
Measure out 2cm^3 of pH buffer solution.

Buffer = Control pH.

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3) Place all three test tubes in a water bath at 30*C. Leave them for 10 minutes to allow the solutions to reach the correct temperature.

4) Now combine the three solutions into one test tube and mix with a stirring rod. Return the test tube to the water bath and start a stopwatch.

5) After thirty seconds, use the stirring rod to transfer one drop of solution to a well in the spotting tile which contains iodine.