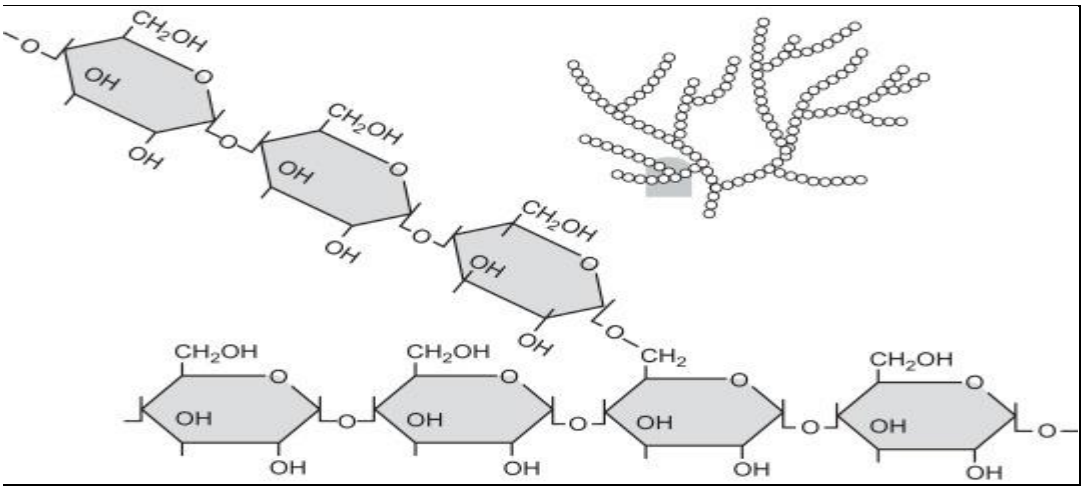
Hydrolysis of starch by salivary amylase

Amylases are digestive enzymes secreted by the salivary glands and the exocrine pancreas for the purpose of breaking down complex polysaccharides (starch and glycogen) into simpler saccharides like glucose, maltose (2glocose molecules) and limit dextran (5-8 glucose molecules, oligosaccharides). The isoenzymes of amylase are the pancreatic amylase which is designated as (p) and appears to be only of pancreatic origin whereas the salivary amylase (s) may also secreted by the fallopian tube and certain tumours. The salivary amylase, ptyalin, begins the digestion in the mouth, continues briefly in the stomach until the pH drops too low. Digestion is then completed in the intestine by the attack of pancreatic amylase. Both types digest polysaccharide by breaking down the α, 1-4 glucoside linkage between glucose molecules while the 1-6 bond leaved untouched. In this experiment the effect of amylase enzyme in saliva on starch suspension will be studied.



The structure of glycogen

Procedure:

1- Collect 5-10 ml of saliva in a beaker and filter through a wet filter paper.

2- In a large test tube prepare the stock solution.

3- Label 4 test tubes from (1-4). In each tube add (0.5 ml) iodine solution and 10 ml distilled water.

4- Take 0.5 ml from the stock solution and put it in tube number (1) and note the color.

5- Add (0.5 ml) saliva into the stock solution, mix gently and incubate in (37 ˚c) water bath. Don't overheat or you will inactivate the enzyme.

6- At 5 minutes take (0.5 ml) from the stock and test for starch in tube number (2).

7- Repeat the iodine test at 10 minutes and 20 minutes in tube number (3) and (4) respectively and note the color, compare the color produced in the 4 tube.