

# **ESTIMATION OF AMYLASE ENZYME**

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**Lab -8- Metabolic Disorders**

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**Amylase** is an enzyme belonging to the class of hydro lases . It catalyzed the break down of starch and glycogen starch consists of both amylose and amylopectin . Amylose is along of glucose molecules linking by  $\alpha$  (1 - 4) glycosidic bonds and amylopectin is linked by  $\alpha$  (1 - 6) linkages at the branch . points

### **-: Amylase sources in the body**

Pancreas and the Salivary glands are the major tissue sources of serum amylase.1  
. Skeletal muscle , small intestine and the fallopian tubes lesser concentrations .2



## Types of amylase:

1-  $\alpha$ -amylase:  $\alpha$ -amylases names 1,4- $\alpha$ -D-glucan glucanohydrolase; glycogenase; saccharogen amylase, it is breaks down long-chain carbohydrates ultimately yielding maltotriose and maltose from amylose, or maltose, glucose and "limit dextrin" from amylopectin.

2-  $\beta$ -Amylase: It names 1,4- $\alpha$ -D-glucan maltohydrolase; glycogenase;.  $\beta$ -amylase catalyzes the hydrolysis of the second  $\alpha$ -1,4 glycosidic bond, cleaving off two glucose units (maltose) at a time.

3-  $\gamma$ -Amylase: It names: Glucan 1,4- $\alpha$ -glucosidase; amyloglucosidase; Exo-1,4- $\alpha$ glucosidase; glucoamylase; lysosomal  $\alpha$ -glucosidase; 1,4- $\alpha$ -D-glucan glucohydrolase). Unlike the other forms of amylase,  $\gamma$ -amylase is most efficient in acidic environments and has an optimum pH of 3.

## :Amylase properties

. It active in PH = 6.7 – 7.1

. It is peaceful at room temperature with one week .2

. °C It is active at 37 .3

Activity increase with  $\text{Ca}^{2+}$  and some anions such as  $\text{Cl}^-$  ,  $\text{Br}^-$  ,  $\text{NO}_3^-$  ,  $\text{ClO}_3^-$  .4

.  $=^-$  ,  $\text{HPO}_4$

It is smaller size , the molecular weight of ( 50 – 55 ) K.D therefore it is appear .5

. in the urine



## -: Clinical Sinificance

:Amylase levels are increased in serum in many conditions

- . Sudden swelling of the pancreas (acute pancreatitis)Pancreatic carcinoma .1
- .Pancreatic carcinoma .2
- . Intestinal infarction .3
- . Hepatitis .4
- . Liver cirrhosis .5
- . Cholecystitis .6
- . Diabetic keto acidosis .7
- . Salivary gland lesions .8
- .Swelling in the abdomen (ascites) .9



: **Why get tested?** Primarily to diagnose and monitor

Acute pancreatitis.1

Chronic pancreatitis.2

Or other pancreatic diseases like pancreatic tumor in rare cases, increased.3

.amounts of amylase are released into the blood

**The normal range for amylase in a blood sample for an adult is**

**.30-110 units per liter (U/L)**



**Thank you for  
listening**

