



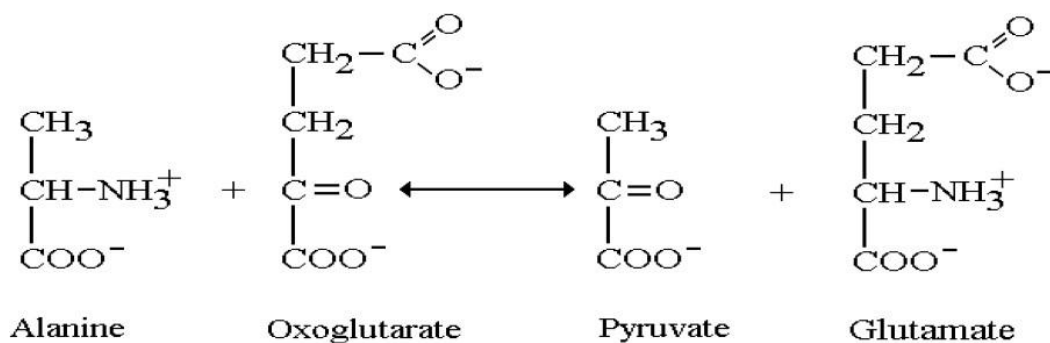
**Title of the lecture: Determination of Serum GOT and GPT**

**M.Sc HANADI TAHSEIN**

## **Determination of Serum GOT(AST) and GPT(ALT)**

Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) are enzymes found mainly in the liver, but also found in red blood cells, heart cells, muscle tissue and other organs, such as the pancreas and kidneys. AST and ALT formerly are called serum glutamic oxaloacetic transaminase (GOT) and serum glutamic pyruvic transaminase (GPT), respectively. AST or ALT levels are a valuable aid primarily in the diagnosis of liver disease. Although not specific for liver disease, it can be used in combination with other enzymes to monitor the course of various liver disorders. The normal concentrations in the blood are from 5 to 40 U l<sup>-1</sup> for AST and from 5 to 35 U l<sup>-1</sup> for ALT. However, when body tissue or an organ such as the liver or heart is diseased or damaged, additional AST and ALT are released into the bloodstream, causing levels of the enzyme to rise. Therefore, the amount of AST and ALT in the blood is directly related to the extent of the tissue damage. After severe damage, AST levels rise 10 to 20 times and greater than normal, whereas ALT can reach higher levels (up to 50 times greater than normal). On the other hand, the ratio of AST to ALT (AST/ALT) sometimes can help determine whether the liver or another organ has been damaged.

### **ALT or sGPT (serum glutamate pyruvate transaminase)**

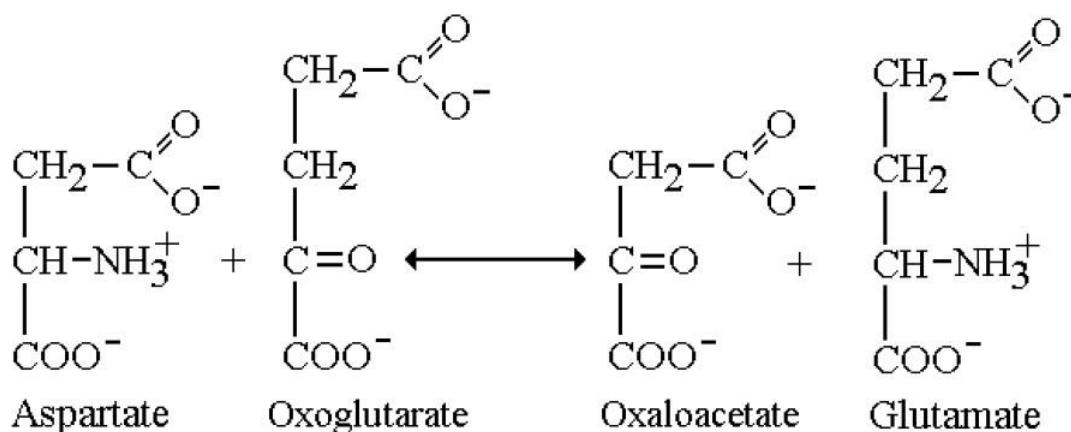


## M.Sc HANADI TAHSEIN

### Elevated levels of GPT may indicate:

- ✚ Alcoholic liver disease
- ✚ Cancer of the liver
- ✚ Cholestasis or congestion of the bile ducts
- ✚ Cirrhosis or scarring of the liver with loss of function
- ✚ Death of liver tissue
- ✚ Hepatitis or inflammation of the liver
- ✚ Noncancerous tumor of the liver
- ✚ Use of medicines or drugs toxic to the liver

### AST or sGOT (serum glutamate oxaloacetate transaminase)



### Elevated levels of GOT may indicate :

- ✚ Acute hemolytic anemia,
- ✚ Acute pancreatitis or inflammation of the pancreas.
- ✚ Acute renal failure or loss of kidney function.
- ✚ Cirrhosis of the liver.
- ✚ Hepatitis
- ✚ *Heart attack*
- ✚ Primary muscle disease
- ✚ Recent surgery
- ✚ Severe burns
- ✚ Muscle injury



### M.Sc HANADI TAHSEIN

\*\*\*GOT also reflects damage to the hepatic cells and is less specific for liver disease. It can also be released with *heart, muscle and brain disorders* . Therefore, GPT test may be ordered to help diagnose various heart, muscle or brain disorders, such as a myocardial infarct (heart attack).

Although GOT is not a specific for liver as the GPT, ratios between GPT and GOT are useful to physicians in assessing the etiology of liver enzyme abnormalities.

- ◆ Normally : GPT is normal, GOT is normal, GPT/GOT is about 1.15.
- ◆ Virus hepatitis: GPT↑, GOT is normal, GPT/GOT > 1, even more than 2.5 ;
- ◆ Chronic hepatitis: GPT↑, GOT ↑ GPT/GOT is about 1.
- ◆ Liver cancer, cirrhosis, Alcohol-induced hepatitis: GPT, GOT < 1, about 0.6~0.7.
- ◆ Accute myocardial infarct : < 1

GPT and GOT is in the different distribution of the hepatocytes. GPT exists primarily in the **cytoplasm** of liver cell. If there is a slight liver cell damage, GPT firstly leak into the bloodstream, so that the serum GPT increased.

The GOT mainly in the "**mitochondria**" of liver cells, the mitochondria are "bubble" in the liver cell cytoplasm. If there is a slight liver cell damage, GOT don't leak into the bloodstream.