Possible causes of an elevated Serum Gamma Glutamyl Transferase (GGT)

(GGT > 100 U/L)

ALT < 80 U/L; ALP < 200 U/L

Liver enzyme induction

Alcohol excess

Drugs

Barbiturates
Benzodiazepines
Phenytoin
Tricyclics
Warfarin

Obesity

Diabetes mellitus

Steatosis, NASH (Non-Alcohol Steatohepatitis)

Hypertriglyceridaemia

‘Normal’ for subject
(some subjects have ‘normal’ GGT values of up to 120 U/L)

ALT < 80 U/L; ALP > 200 U/L

Cholestatic liver disease

Extrahepatic obstruction
Intrahepatic obstruction
Drug/Alcohol toxicity
Space-occupying lesion
Cirrhosis

Two disorders, for example:

Liver enzyme induction plus bone disease

Phenytoin (induces liver GGT production, and also stimulates bone ALP directly)

ALT > 80 U/L; ALP < 200 U/L

Hepatocellular disease

Steatohepatitis (NASH)
Drug/Alcohol toxicity
Hepatitis (A, B, C)
EBV infection

ALT > 80 U/L; ALP > 200 U/L

Mixed Hepatocellular and Cholestatic disease

Acute hepatitis
Chronic active hepatitis
Space-occupying lesion
Cirrhosis
Drug/Alcohol toxicity

1. In alcoholic liver disease, the AST is often greater than ALT.
2. Space-occupying lesions: malignancy, abscess, cyst, etc.