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**
- 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.