

Alkaline Phosphatase – [Serum] Analysis

Objective

The objective of this test is to measure alkaline phosphatase (ALP) activity in serum. ALP is an important enzyme linked to liver, bone, and bile duct function, and its measurement assists in diagnosing liver diseases, bone disorders, and biliary obstructions.

Materials and Methods

Materials:

- Serum sample from patient
- ALP assay reagents (colorimetric method)
- Spectrophotometer or automated analyzer
- Standard laboratory equipment (pipettes, centrifuge)

Methods:

1. Sample Collection: Collect venous blood and separate serum via centrifugation.
2. Enzyme Activity Measurement: Perform colorimetric assay to determine ALP activity (e.g., using p-nitrophenyl phosphate substrate).
3. Quality Control: Run calibration standards and quality control samples alongside patient samples.
4. Interpretation: Compare measured ALP activity to reference ranges; consider age, pregnancy, and bone growth factors in interpretation.

Results

- Normal range (adults): 44–147 IU/L (varies by laboratory)
- Elevated ALP: Suggests cholestasis, bone disease (e.g., Paget's disease), or physiological causes (e.g., pregnancy)
- Decreased ALP: May indicate malnutrition, zinc deficiency, or hypothyroidism

Conclusion

Serum alkaline phosphatase testing is an essential diagnostic tool for liver and bone health evaluation. Interpretation requires correlation with other liver function tests, imaging studies, and clinical findings for accurate diagnosis.