

## DPD Total (Deoxypyridinoline), Serum

**Analyte:** Deoxypyridinoline, Total

**Specimen Type:** Serum

**Optimum Volume:** 1 mL

**Stability:**

2-8 Degrees C	-20 Degrees C	-70 Degrees C
4 days	21 days	2 years

**Reporting Units:** nmol/L

**Method:** ELISA

**Biological or Clinical Significance:**

Bone is constantly undergoing a metabolic process called remodeling. This includes a degradation process, bone resorption, mediated by the action of osteoclasts, and a building process, bone formation, mediated by the action of osteoblasts.

Approximately 90% of the organic matrix of bone is type I collagen, a triple helical protein. Type I collagen of bone is cross-linked by specific molecules that provide rigidity and strength. Cross-links of mature type I collagen in bone are the pyridinium cross-links, pyridinoline (PYD) and deoxypyridinoline (DPD). DPD is formed by the enzymatic action of lysyl oxidase on the amino acid lysine. DPD is released into the circulation during the bone resorption process. DPD is excreted unmetabolized in urine and is unaffected by diet, making it suitable for assessing resorption.

In humans, the total pool of urinary DPD is approximately 45% free while the remaining fraction is bound to oligopeptides ranging from small linear peptides to very large cross-linked structures in excess of 10,000 Da. Free and total cross-links appear in healthy individuals and those with metabolic bone diseases, thus providing the rationale for measuring the combined total forms of DPD.

**Principle of Test Method:**

The DPD assay is a solid-phase ELISA that employs the quantitative competitive enzyme immunoassay principle.

**References:**

1. Hesley RP, Shepard KA, Jenkins DK, Riggs BL. Monitoring estrogen replacement therapy and identifying rapid bone losers with an immunoassay for deoxypyridinoline. *Osteoporosis Int* 1998; 8:159-164.