Clusterin (APO J)

Analyte: Clusterin

Specimen Type: Urine

Optimum Volume: 1 mL

2-8°C	-20°C	-70°C
Unstable*	N.A.*	N.A.*

Reporting units: ng/mL; ng/mg Creatinine (normalized)

Method: ELISA

Biological or Clinical Significance:

Clusterin (also know as apolipoprotein J, sulfated glycoprotein 2 (SGP-2), TRPM-2, and SP-40) is a secreted multifunctional protein that was named for its ability to induce cellular clustering. It binds a wide range of molecules and may function as a chaperone of misfolded extracellular proteins. It also participates in the control of cell proliferation, apoptosis, and carcinogenesis. Clusterin is predominantly expressed in adult testis, ovary, adrenal gland, liver, heart, brain, and in many epithelial tissues during embryonic development. Human clusterin is synthesized as a precursor that contains two coiled domains, three nuclear localization signals (NLS), and one heparin binding domain. Intracellular cleavages of the precursor remove the signal peptide and generate comparably sized α and β chains which are secreted as an approximately 80 kDa N-glycosylated and disulfide-linked heterodimer. Mature human clusterin shares a 77% amino acid sequence identity with mouse and rat clusterin.

High levels (µg/mL) of clusterin circulate predominantly as a component of high-density lipoprotein particles, and these are internalized and degraded through interactions with LPR-2/megalin. The ability of clusterin to bind and neutralize non-oxidatively modified LDL reduces cytotoxicity in atherosclerotic plaques. The chaperone function of clusterin helps to reduce the accumulation of the β-amyloid fibrils and damage due to amyloid plaques in Alzheimer’s disease. An alternately spliced 50 kDa isoform o f human clusterin remains intracellularly and is neither glycosylated nor cleaved into α and β chains. Cellular exposure to ionizing radiation promotes the translocation of nCLU to the nucleus where it interacts with Ku70 and promotes apoptosis. This function contrasts with the cyoprotective effect of secreted clusterin. During tumor progression, nCLU is down-regulated while the secreted form is up-regulated and may be aberrantly glycosylated. Increased circulating levels of clusterin enhance tumor aggressiveness by inhibiting apoptosis and by promoting the epithelial to messenchymal transition.

Determination of urine clusterin has been shown to have utility in tracking kidney injury in the animals. Thus, it detects acute kidney injury expression in kidney tissue when it is induced by administration of nephrotoxic agents, and this occurs before the profound renal transformations that give rise to changes in creatinine and BUN.

Principle of Test Method:

The clusterin assay is a solid phase ELISA designed to measure humin clusterin in cell culture supernates, serum, plasma, urine and saliva. The assay employs the quantitative sanwich enzyme immunoassay technique.

*Please contact nexelis for stability information.