Adiponectin [HMW (High Molecular Weight)]

**Analyte:** Adiponectin, HMW

**Specimen Type:** Serum, EDTA Plasma

**Optimum Volume:** 0.5 mL

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Stability</th>
<th>Storage</th>
</tr>
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<tbody>
<tr>
<td>2-8°C</td>
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<td>23 days</td>
</tr>
<tr>
<td>-20°C</td>
<td>Unstable</td>
<td>2 years</td>
</tr>
<tr>
<td>-70°C</td>
<td>Unstable</td>
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</tbody>
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**Reporting units:** ug/mL

**Method:** ELISA

**Biological or Clinical Significance:**

Adiponectin, also known as Acrp30, apM1, AdipoQ, and GBP28, is a 30 kDa glycoprotein that is secreted primarily by adipocytes and induces wide ranging paracrine and endocrine effects on metabolism and inflammation. Mature human adiponectin consists of a 60 amino acid N-terminal collagenous region and a 137 amino acid C-terminal C1q/TNF-α-like globular domain and shares approximately 85% sequence identity with mouse and rat adiponectin.

Adiponectin forms 90 kDa homotrimers that contain two disulfide-linked monomers and a third subunit which is noncovalently associated. Two trimers can be covalently linked to create a 180 kDa hexamer which associates into greater than 300 kDa high molecular weight adiponectin. The various forms of adiponectin do not interconvert in the serum. The ratio between different forms of adiponectin may be biologically significant; a much greater amount of high molecular weight (HMW) adiponectin circulates in females compared to males, although the levels of trimeric and hexameric adiponectin are comparable between genders. Circulating adiponectin levels are high, comprising approximately 0.01% of total plasma protein.

Adiponectin promotes insulin sensitivity through multiple actions on glucose and fatty acid metabolism, frequently in opposition to the actions of TNF-α. It induces a decrease in serum glucose and triglyceride levels, an increase in serum glucagon, but no change in insulin levels. In the liver, adiponectin enhances the insulin-dependent inhibition of gluconeogenesis. In skeletal muscle, adiponectin promotes fatty acid uptake and oxidation, glucose uptake, and lactate production. HMW adiponectin is the most potent isoform at inducing insulin sensitization in the liver. Adiponectin is more potent than the full length molecule at inducing metabolic effects in muscle. In the adult (but not in the fetus) elevated levels of circulating
total adiponectin, particularly HMW adiponectin, are negatively correlated with conditions related to metabolic syndrome. Decreased plasma HMW adiponectin levels are associated with upper body obesity, insulin resistance, reduced fatty acid oxidation, dyslipidemia, coronary artery disease and artherogenesis. Plasma HMW adiponectin levels increase in response to treatment with insulin-sensitizing thiazolidinediones.

Adiponectin inhibits inflammation by antagonizing TNF-α induced vascular endothelial cell apoptosis and the upregulation of leukocytes adhesion proteins on the vascular endothelium. In macrophages, adiponectin promotes polarization toward the M-2 anti-inflammatory phenotype, inhibits TNF-α production, and interacts with C1qRp to promote the clearance of adiponectin-opsonized apoptotic cell debris. It protects against artherosclerosis by suppressing nitric oxide formation, the progression of macrophages into foam cells, and the migration of adventitial fibroblasts to the intima. In nonmetabolic disorders such as rheumatoid arthritis and inflammatory bowel disease, however, adiponectin levels are elevated and it can promote inflammation. Adiponectin also negatively regulates myelomonocytic progenitor cell growth.

**Principle of Test Method:**
The HMW Adiponectin/Acrp30 assay is a solid phase ELISA assay designed to measuer human HMW adiponectin in serum and plasma. This assay employs the quantitative sandwich enzyme immunoassay technique.

**References:**