



LAB #: Sample Report  
PATIENT: Sample Patient  
ID:  
SEX: Female  
DOB: 01/01/1941      AGE: 78

CLIENT #: 12345  
DOCTOR: Sample Doctor  
Doctor's Data, Inc.  
3755 Illinois Ave.  
St. Charles, IL 60174 U.S.A.

## Oxidized LDL; serum

### RESULTS

|              | Within  | Outside  | Reference Range |     |
|--------------|---|--|-----------------|-----|
| Oxidized LDL | <span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 20px; height: 15px;"></span> | <span style="background-color: #FFB6C1; border: 1px solid black; display: inline-block; width: 20px; height: 15px;"></span> 69 | < 45            | U/L |

### INFORMATION

This test measures serum/plasma levels of oxidized low density lipoproteins (Ox-LDL) using a highly sensitive and specific immunoassay. Oxidized low density lipoproteins are directly involved in the initiation and progression of atherosclerotic lesions in coronary arteries that can result in atherosclerotic coronary artery disease (CAD). Serum/plasma levels of Ox-LDL are a sensitive biomarker of atherosclerosis. Elevated levels of Ox-LDL are associated with accelerated atherogenesis, CAD, acute myocardial infarction and stable and unstable angina. Importantly, the levels of total cholesterol are not necessarily higher than normal in patients with unstable CAD. Elevated Ox-LDL has also been associated with metabolic syndrome, impaired glucose tolerance/insulin resistance and untreated overt hypothyroidism.

Low density lipoproteins (LDL), the major carrier of circulating cholesterol, are very susceptible to oxidation of the constituent apoB-100 protein moiety by prooxidants such as metal ions, reactive oxygen radicals, oxidized macrophages, lipoxygenase and peroxynitrite. When the LDL protein is oxidized it becomes antigenic and the Ox-LDL are taken up excessively by the unregulated "scavenger" or "Ox-LDL receptors" on monocyte-derived macrophages. Native LDL (un-oxidized) are not involved in the unregulated uptake process and Ox-LDL is present in macrophages in atherosclerotic lesions but not in normal arteries. Once macrophages breach the arterial endothelial barrier (damaged) the excessive uptake of lipids form Ox-LDL contributes to their entrapment in the sub-endothelial space. The trapped lipid-laden "foam" cells elicit biosynthesis and release of factors by the arterial wall that are pro-inflammatory and chemotactic for other monocytes, perpetuating the atherosclerotic process with injury to the arteries. Injury to the sub-endothelial vessel walls results in decreased production of nitric oxide and elasticity of the arteries and, the damaged lipid-laden arteries eventually narrow restricting the flow of blood.

Increased antioxidant protection and amelioration of oxidative stress would be expected to decrease levels of atherogenic Ox-LDL. These test results should be interpreted in context with the constellation and severity of symptoms/findings and family history. Direct testing for CAD may be warranted if the level of Ox-LDL is undesirable.

#### References:

- Steinberg D. Oxidative modification of LDL and atherosclerosis. *Circulation* (1997)95:1062-71.
- Holvoet P et al. Ox-LDL and malondialdehyde-modified LDL in patients with acute coronary syndromes and stable CAD. *Circ*(1998)98:1487-94.
- Schulze PC, Lee RT. Oxidative stress and atherosclerosis. *Curr Atheroscler Rep*(2005)7:242-8.
- Fuhrman B et al. Oxidative stress increases the expression of the CD36 scavenger receptors and the cellular of oxidized LDL in macrophages fro atherosclerotic mice: protective role of antioxidants and paraoxonase. *Atherosclerosis*(2002)161:307-16.
- Rosenblat M et al. Anti-oxidant and anti-atherogenic properties of liposomal glutathione: Studies in vitro, and in atherosclerotic apo-E deficient mice. *Atherosclerosis*(2007)195:e61-e68.
- Rajasekaran NS et al. Chronic depletion of glutathione (GSH) and minimal modification of LDL in vivo: its prevention by glutathione mono ester (GME) therapy. *BBA*(2005)1741:103-12.
- Ryoo S et al. Oxidized LDL-dependent endothelial arginase II activation contributes to impaired nitric oxide signaling. *Circ Res*(2006)99:951-60.
- Oxidized LDL and maldondialdehyde-modified LDL. [www.oxldtest.com/](http://www.oxldtest.com/)

#### Comments:

Date Collected: 04/05/2019  
Date Received: 04/11/2019  
Date Completed: 04/12/2019  
Methodology: EIA