Caeruloplasmin (blood)

Pseudonyms: Ceruloplasmin; Copper Oxidase; Ferroxidase; EC 1.16.3.1

Caeruloplasmin can be measured alongside copper to aid the diagnosis of Wilson's disease. Serum copper and caeruloplasmin levels are usually low in patients with Wilson's disease, however caeruloplasmin may also be normal or elevated in these patients due to to the acute phase response. As such serum caeruloplasmin alone has a low positive predictive value in patients undergoing evaluation for liver disease. Acute hepatitis in Wilson's disease can increase caeruloplasmin into the normal range due to the acute phase response. An equivocal test should be followed by analysis of 24hr urine copper. The majority of Wilson's disease patients are diagnosed between the ages of 5 and 35 years, although it has been diagnosed in younger patients and in those their 70s.

Marked renal or enteric protein loss, such as nephrotic syndrome or protein-losing enteropathy and chronic or end stage liver disease can lead to a low caeruloplasmin. Rarer causes of a low caeruloplasmin include diseases such as Menke's disease (a rare disease of infancy), acaeuloplasminaemia and copper deficiency in patients receiving inadequate copper with parenteral nutrition and following bariatric surgery. Pregnancy, oestrogen supplementation in the form of the Oral Contraceptive Pill (OCP) or Hormone Replacement Therapy (HRT) can all increase caeruloplasmin levels. As it is also an acute phase reactant so it may also be raised in the context of inflammation and tissue injury.

General Information

Collection container:
Adults: 4.9mL Serum (Sarstedt white top) / LiHep Plasma (Sarstedt orange top)
Paediatrics: 1.2mL Serum (Sarstedt white top) / LiHep Plasma (Sarstedt orange top)

Type and volume of sample:
Serum or Lithium Heparin Plasma
1.0mL whole blood required (minimum 150µL separated serum/plasma).

Specimen transport/special precautions:
Internal: stable for 14 days at 4°C once separated.
External – Send 1st class post.

Laboratory information

Method principle:
Immunoturbidimetry method (Roche Cobas platform)

Biological Reference Range or cut off: In-house derived reference ranges based on Roche conversion from CALIPER data.

<2 months	45 - 213 mg/L

2 months to 1 year	109 - 371 mg/L
1 year to 18 years	181 - 416 mg/L
>18 years	200 - 600 mg/L

Turnaround times: 1 week from receipt of sample

Clinical information

Factors known to significantly affect the results:

Samples collected into EDTA tubes are not suitable for analysis.

Grossly lipaemic samples are not suitable for analysis.

Clinical decision points:

<18 years <181 mg/L – may be consistent with Wilsons (In-house derived cut-off).
Supply a 24 hour urine (plain container) for urine copper estimation.