

## Division of Laboratory Medicine

### Biochemistry

## C-peptide

C-peptide measurements can be used for the following:

- To detect endogenous insulin secretion in the presence of exogenous insulin.
- In the investigation of hypoglycaemia

### General information

**Collection container:** Lithium heparin plasma (Sarstedt orange top, 4.9 mL adults / 1.2 mL paediatrics) Serum (Sarstedt brown top 4.9 mL adults / white top 1.2 mL paediatrics)

**Type and volume of sample:** 0.5 mL whole blood is required as a minimum volume.

**Specimen transport/special precautions:** The tubes should be thoroughly mixed and transported to the lab within 2.5 hours. Separate and freeze plasma/serum immediately. External labs: send plasma/serum frozen on dry ice.

### Laboratory information

**Method principle:** C-peptide is analysed using a manual solid phase two-site immunoassay. A peroxidase conjugated mouse monoclonal anti-C-peptide antibody is used which reacts with 3,3',5,5'-tetramethylbenzidine (TMB). The reaction is stopped by adding acid to give a colorimetric endpoint that is read spectrophotometrically.

### Biological reference range:

Fasting reference range: 350-1800 pmol/L

**Turnaround time:** 10 working days

### Clinical information

Insulin is the principle hormone responsible for the control of glucose metabolism. It is a peptide hormone containing 51 amino acids in total in two chains (A + B), which are linked by two inter-chain disulphide bridges. It synthesised and secreted by the  $\beta$ -cells of the pancreas. Pro-insulin is cleaved to produce Insulin and C-Peptide which are released in equimolar amounts.

The C-peptide assay can be used to detect endogenous insulin secretion in the presence of exogenous insulin. In hypoglycaemia, the presence of an inappropriately high insulin with a low C-peptide may suggest an exogenous source of insulin.

It is also used for the following applications:

- To assess the residual  $\beta$ -cell function in patients with insulin and to distinguish between IDDM and NIDDM.
- Insulinoma diagnosis, especially in patients treated with insulin.

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- As a marker for residual pancreatic tissue after pancreatectomy, and may be used to detect metastasis in patients with insulinoma.
- To monitor the progress of pancreas or islet cell transplantation.

#### **Cross-reactivity with insulin analogues:**

<b>Substance</b>	<b>Interference</b>
Insulin	<0.0006%
Proinsulin	<1.8%
Des 31-32 proinsulin	3%
Split 32-33 proinsulin	2%
Des 64-65 proinsulin	74%
Split 65-66 proinsulin	10%

**Factors known to significantly affect the results:** Haemolysed samples are unsuitable for analysis.

**(Last updated February 2016)**