

# CA125

<b>Abbreviations</b>	CA125, MUC 16
<b>Accession Number</b>	Q8WXI7
<b>Source</b>	Human carcinoma cell line
<b>Applications</b>	Control Manufacture, Life Science, Clinical Chemistry, Biosensors, ELISA Assay, Lateral Flow

## Protein Structure and Function

The CA125 was initially defined by work completed in the Centocor laboratories in the early 1980's<sup>1</sup>. A monoclonal antibody was developed to a membrane protein which defined CA125. Later work established the structure of isolated CA125 also known as the Mucin, MUC 16 defined by highly O-glycosylated repeats. CA125 is a type I transmembrane protein with a short intracellular and a giant extracellular domain, the latter with 22,097 amino acid residues. The extracellular part is composed of an amino-terminal part spanning 12,070 residues followed by more than 60 tandem repeats of a 156-amino acid motif and a 229-residue linker to the transmembrane domain. Both the amino-terminal part and the repeat domains are rich in serine and threonine residues and are highly glycosylated. The carbohydrate content has been estimated at 24–28%, with O-linked and N-linked glycans. Although the structure of CA125 has been elucidated, a functional role for this molecule in the physiological context or its role in cancer remains unknown. A number of publications<sup>2&3</sup> have shown that several properties of CA125 may have relevance for its biological function. As it is expressed in embryonic membranes and adult derivatives of the fetal periderm, CA125 has been suggested to play a role as a lubricant, preventing adhesion of membranes. Anti-adhesive properties have also been assigned to branched O-glycans on leucosialin/CD43 and other mucins.

## Tissue Occurrence & Abundance

CA125 is secreted via the endoplasmic reticulum (ER) and Golgi apparatus by a signal peptide independent mechanism. It is a component of the ocular surface, the respiratory tract and the female reproductive tract epithelia. Since CA125 is highly glycosylated it creates a hydrophilic environment that acts as a lubricating barrier against foreign particles and infectious agents on the apical membrane of epithelial cells. Quantities of CA125 are expressed in terms of units, which were defined during the early work on the initial RIA method and equate to approximately 1ng of protein.

## Function in Disease

The number of patients whose tumour tissue stains positive for CA125 is approximately 90% in serous ovarian adenocarcinoma, as well as, in endometrioid endometrial carcinoma. However, the numbers of patients whose serum CA125 levels are elevated are only 80% and 21% for ovarian cancer and endometrioid endometrial carcinoma, respectively. It is however useful in monitoring treatment and recurrence of ovarian cancer. Lately the UK NICE guidelines have recommended its use in conjunction with HE4.

## Structure

Molecular weight	1,519,175 Da (Theoretical peptide molecular weight without glycosylation)
Amino acids	14507
Disulphide bonds	May contain numerous disulfide bridges. Association of several molecules of the secreted form may occur through interchain disulfide bridges providing an extraordinarily large gel-like matrix in the extracellular space or in the lumen of secretory ducts.
Glycosylation	Heavily O-glycosylated; expresses both type 1 and type 2 core glycans, N-glycosylated; expresses primarily high mannose and complex bisecting type N-linked glycans.
Phosphorylation	May be phosphorylated. Phosphorylation of the intracellular C-terminal domain may induce proteolytic cleavage and the liberation of the extracellular domain into the extracellular space.
Oligomerisation	None

## References

1. Klug T.L. et al. (1984) Monoclonal Antibody Immunoradiometric Assay for an Antigenic Determinant (CA 125) Associated with Human Epithelial Ovarian Carcinomas. *Cancer Research* 44, 1048-1053
2. O'Brien, T.J. et al. (2001) The CA 125 gene: an extracellular superstructure dominated by repeat sequences. *Tumour Biol.* 22, 348–366
3. Kui Wong, N. et al. (2003) Characterization of the oligosaccharides associated with the human ovarian tumor marker CA125. *J. Biol. Chem.* 278, 28619–28634

### WHY CHOOSE BBI'S CA125 ANTIGENS?

- + Our production facilities allow us to offer consistent and reproducible **large batch sizes** up to thousands of Ku
- + With a network of global labs and hospitals, we can access many **diverse testing platforms**, providing you with the exact analysis results you need
- + With over 25 years' experience sourcing human biologicals and a stable cell line you can be confident in a **secure European supply chain**
- + **Very low cross reactivity** with closely-related molecules
- + We can **adapt dispensations and testing methodologies** to meet your needs

<b>Grade &amp; Concentration</b>	Low cross reactivity grade, >250Ku/ml	
<b>Stability &amp; Formulation</b>	Supplied liquid frozen – Store at below -15°C	
<b>Assay recovery and contamination profile specification</b>	CA125 concentration by Roche Modular	> 250 Ku/ml
	CA15-3 concentration as determined by Roche Modular	<10% of CA125
	CA19-9 concentration as determined by Roche Modular.	<1% of CA125
	CA72-4 concentration as determined by Roche Modular.	<1% of CA125
<b>Dispensations</b>	20Ku, 100Ku, 1000Ku, 10,000Ku	

### Ordering Details

USE THE FOLLOWING CODES WHEN ORDERING

Product	Code	Description
CA125	P251-4	Supplied liquid frozen in PBSA Buffer, assayed by Roche Modular   sourced from human carcinoma cell line

### Related Products

CA15-3	P301-4	CA15-3, Low cross reactivity high concentration. Formulated at >10Ku/ml.
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