BBI Solutions

RECOMBINANT HUMAN BETA-2-MICROGLOBULIN

Alternative Names	B2M, β2M
Uniprot Entry	P61769
Source	Recombinant from *Pichia pastoris*
Suggested Applications	Suitable to use as calibrator or control in a variety of immunoassay applications in different matrices. The purified protein has been characterized by immunological and physical test methods (see below).

Protein Function	Beta-2-microglobulin (β2-microglobulin; B2M) is a component of the major histocompatibility complex (MHC) class I molecules. MHC class I complexes are present extracellularly on all nucleated cells (excluding red blood cells). B2M builds the beta-chain in this complex by associating with the membrane bound alpha-chain. In humans, the Beta-2-microglobulin protein is encoded by the B2M gene. The major histocompatibility complex (MHC) class I is involved in presenting peptide antigens to cells of the immune system such as cytotoxic T-cells, therefore enabling the immune system to distinguish between healthy and diseased cells.
Tissue Occurrence & Abundance	B2M is particularly abundant on the surface of monocytes and leucocytes, from which the protein is released into the blood, especially upon activation of the immune system. Because of its low molecular weight (11.8kDa) it is removed from the blood by glomerular filtration in the kidney but reabsorbed by the tubular proximal cells. The normal reference range in serum has been reported as 1.1 to 2.4 mg/L. Recent reviews and new studies are finding new and important roles for the assessment of levels of ß2M.
Function in Disease	Elevated levels of B2M in the blood are indicative of increased production or release due to a number of disorders, such as multiple myeloma, myeloproliferative disorders (leukaemia and lymphoma) and certain viral infections such as HIV, Cytomegalovirus, Hepatitis (non A or B) and infectious mononucleosis. For the diagnosis of multiple myeloma, the serum B2M level is one of the prognostic factors incorporated into the International Staging System. The serum B2M level is elevated (>2.7 mg/L) in 75% of patients at the time of diagnosis. Patients with high values show inferior survival. In addition, B2M levels can be correlated with the disease state as well as tumour burden. In patients on long-term haemodialysis B2M can aggregate into amyloid fibres that deposit in joint spaces.
Structure based on Uniprot entry	Predicted Molecular Weight 11.8 kDa Amino Acids 99 pI ~6

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References

1. M. Wieczorek et al. (2017) Major Histocompatibility Complex (MHC) Class I and MHC Class II Proteins: Conformational Plasticity in Antigen Presentation. Front Immunol. 8:292
2. A.E. Prizment et al. (2016) Circulating beta-2 microglobulin and risk of cancer: the Atherosclerosis Risk in Communities Study (ARIC) Cancer Epidemiol Biomarkers Prev. (4): 657–664.
3. H. Johnson et al. (1980) Serum beta 2 microglobulin levels in patients with testicular cancer. Urology 16(5):522-4.
4. A. Dasgupta and A. Wahed (2014) Clinical Chemistry, Immunology and Laboratory Quality Control.

WHY RECOMBINANT B2M?

+ **High purity:** A protein purity of >98% minimises the risk of interferences due to contaminants.
+ Complements our native B2M with sustainable supply
+ **Intensively tested:** Tested in Immunoassay across multiple test platforms.
+ **Scalable:** Our production facilities allow us to offer large batch sizes ranging from mg to gram quantities.
+ **High quality:** Manufactured in the UK, under ISO 13485 quality management system.

PRODUCT SPECIFICATION, STORAGE AND HANDLING

Purity	> 98% pure (by SDS PAGE analysis); Purification method: Chromatography
Storage & Formulation	Lyophilised – Store refrigerated between 2-8°C, ship packaged on cool packs. Do not freeze. Avoid moisture ingress. Lyophilised from 0.02M NH_4HCO_3.
Reconstitution	Use of phosphate buffer, pH >7.0 containing 0.15M NaCl is recommended.
Shelf-life (lyophilizsed)	5 years from date of manufacture
Dispensations	100 µg, 1 mg, 10mg and 100 mg

Order a sample today **sales@bbisolutions.com**

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TECHNICAL DATA

Product Purity assessment

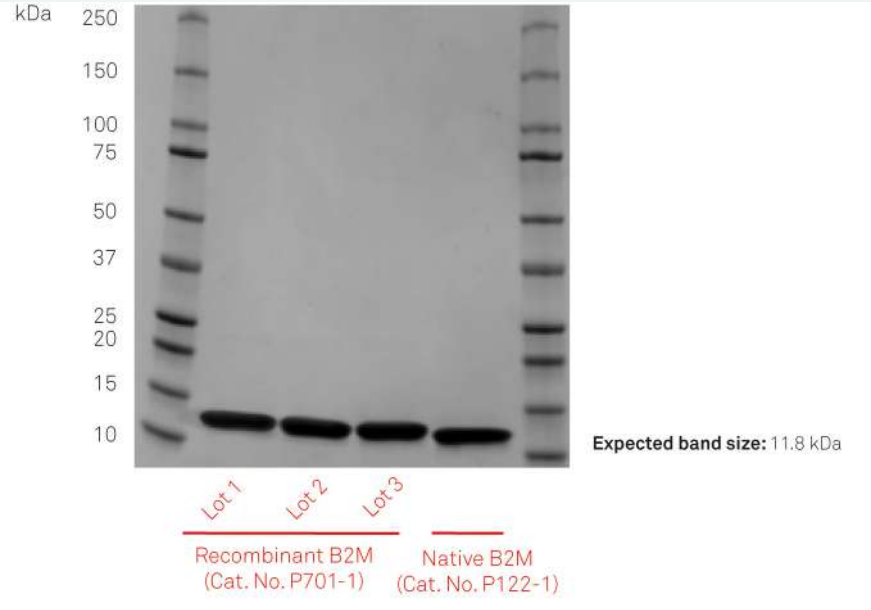

Figure 1: Comparision of three independent lots of recombinant human B2M (Cat. No. P701-1) and native human B2M (Cat. No. P122-1). Rec. or native human B2M were loaded on SDS-PAGE each at a concentration of c= 0.25 mg/ml und run under denaturing/non-reducing conditions. Proteins were visualized using Coomassie staining.

TECHNICAL DATA

Immunoassay recovery and linearity testing

Product Type	Product Code	Lot	Dilution Factor (Stock c= 1 mg/ml)	Mean Prospec Result (mg/L)	Result (mg/ml)	Recovery as % of stock conc.
Recombinant B2M	P701-1	1	500	2,03	1,02	102%
			750	1,34	1,01	101%
			1000	1,02	1,02	102%
		2	500	2	1,00	100%
			750	1,29	0,97	97%
			1000	1,1	1,10	110%
		3	500	1,84	0,92	92%
			750	1,32	0,99	99%
			1000	1,04	1,04	104%
Native B2M	P122-1	1	500	1,875	0,94	94%
			750	1,31	0,98	98%
			1000	0,95	0,95	95%

Table 1

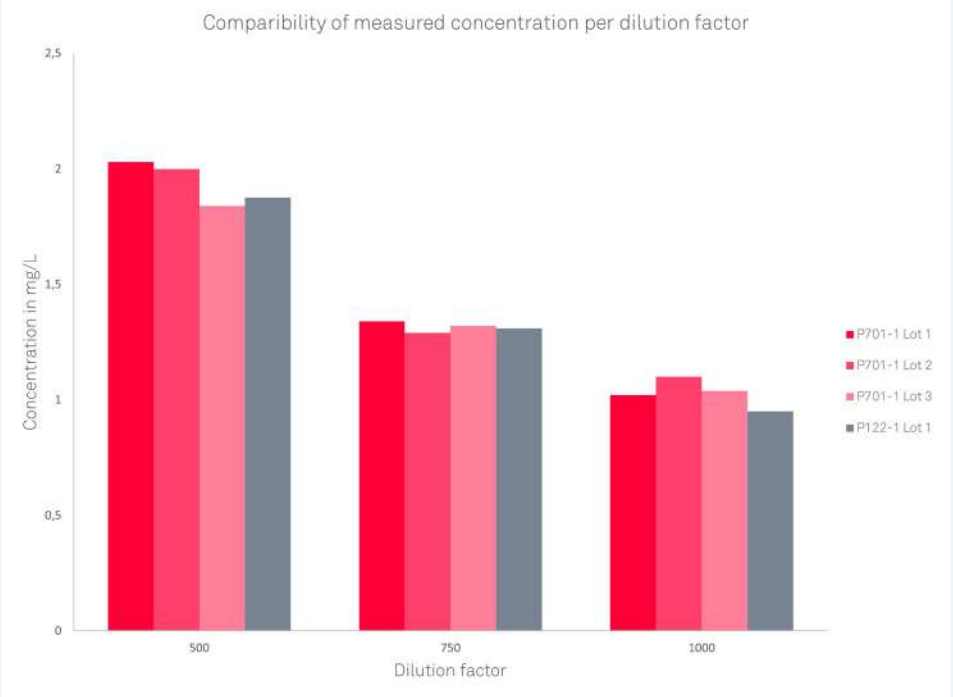

Figure 2: Comparision of recovery of four independent lots of recombinant human B2M (Cat. No. P701-1) and native human B2M (Cat. No. P122-1). All samples were reconstituted at a concentration of 1mg/ml and further diluted as indicated in Table 1 in normal human serum. All samples were subsequently run in duplicates on a Siemens Prospec® instrument (Measuring principle: Nephelometry). Mean results of duplicates are given in table 1.

TECHNICAL DATA

Immunoassay percentage recovery EQA data

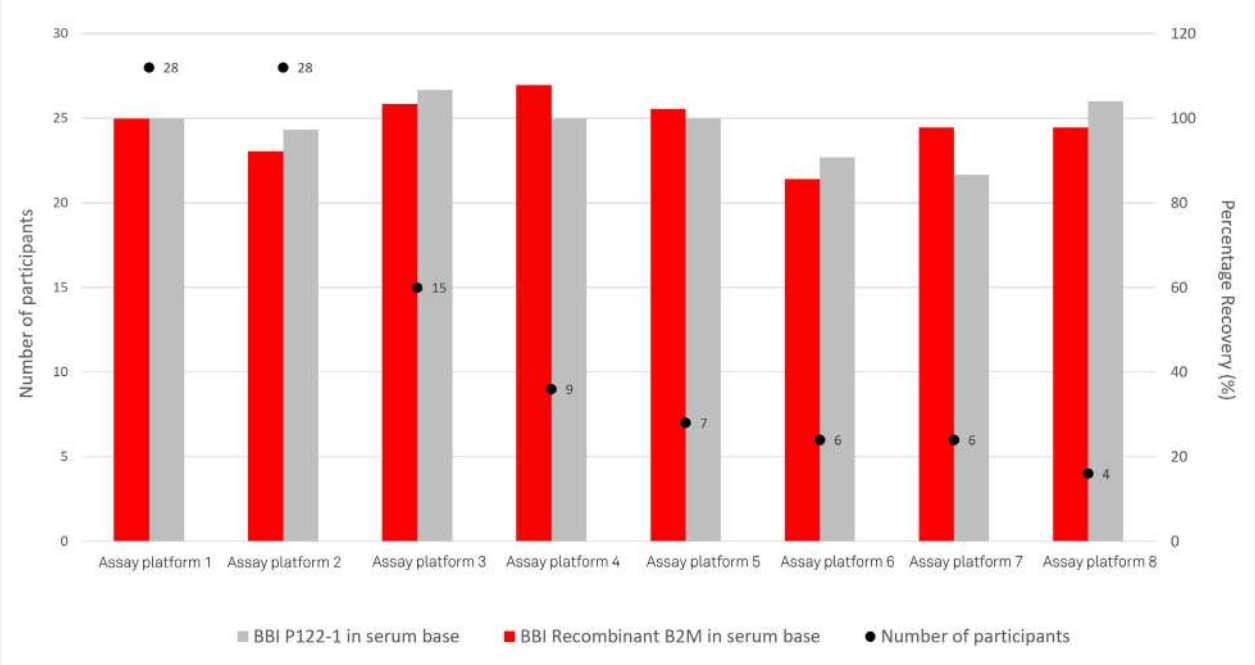

Figure 3: Percentage recovery EQA data for native human Beta-2 microglobulin (B2M; Cat. No. P122-1) and recombinant human Beta-2 microglobulin on assay platforms as indicated. Either native or recombinant B2M were spiked into a serum matrix at a concentration of 10mg/L. Percentage of recovery was calculated using the respective kit standard as reference.

ORDERING DETAILS – USE THE FOLLOWING CODE WHEN ORDERING

Product	Code	Description
Beta-2-Microglobulin (Recombinant)	P701-1	> 98% pure | supplied lyophilised from 0.02M NH_4HCO_3 | expressed from (*Pichia pastoris*)

Order a sample today **sales@bbisolutions.com**

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