

# BETA-2-MICROGLOBULIN

<b>Abbreviations</b>	β2M
<b>Accession Number</b>	P61769
<b>Source</b>	Human Urine (sourced under approved NRES protocol - IRB equivalent)
<b>Applications</b>	As a critical component in the preparation of reagents for biosensors, life science, clinical chemistry, control manufacture, ELISA assay, lateral flow.

<b>Protein Function</b>	<p>Beta-2-microglobulin is an 11.8 kDa protein component of major histocompatibility complex (I) (MHC-I) found on the surface of all cells containing a nucleus. The function of this complex is to display fragments of proteins from within the cell to T-lymphocytes, so that healthy cells are recognised and ignored but cells containing foreign proteins are attacked by the immune system. Additionally, beta-2-microglobulin associates with a non-classical MHC class I alpha-chain to form the neonatal Fc receptor, FcRn. FcRn is a heterodimeric receptor that binds to IgG and albumin, and extends the catabolic half-lives of both these proteins in the blood.<sup>1</sup> It also has a function in regulating the uptake of iron in the small intestine.</p>
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<b>Tissue Occurrence &amp; Abundance</b>	<p>β2M 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 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 1.05 – 3.9 mg/ml.<sup>2</sup> Recent reviews and new studies are finding new and important roles for the assessment of levels of β2M.<sup>3</sup></p>
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<b>Function in Disease</b>	<p>In cases of renal failure β2M is eliminated via the kidneys and appears in the urine; blood levels also rise in these patients. Elevated levels of β2M 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. β2M levels are a particular diagnostic of the prognosis of myeloma and HIV patients. In patients on long-term haemodialysis β2M can aggregate into amyloid fibres that deposit in joint spaces.</p>
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<b>Structure</b>	<b>Molecular weight</b>	11.8 kDa
	<b>Amino acids</b>	99
	<b>Disulphide bonds</b>	1
	<b>pI value(s)</b>	5.8
	<b>Prosthetic group</b>	None
	<b>Glycosylation</b>	β2M is not normally glycosylated but 6 lysine residues and the N-terminal isoleucine have been reported as being glycosylated in cases of patients with haemodialysis associated amyloidosis. <sup>4</sup>
	<b>Isoforms</b>	A form designated pI 5.3 is associated with the absence of the N-terminal isoleucine and the resultant N-terminal glutamic acid is present as pyrrolidone carboxylic acid.

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**References**

1. Wani, M. A., Haynes, L. D., Kim, J., Bronson, C. L., Chaudhury, C., Mohanty, S., Waldmann, T. A., Robinson, J. M., Anderson, C. L. (2006) Familial hypercatabolic hypoproteinemia caused by deficiency of the neonatal Fc receptor, FcRn, due to a mutant  $\beta$ 2-microglobulin gene Proc. Natl. Acad. Sci. 13: 5084-5089
2. Filippin, F. B., Souza L. C. (2005) Serum  $\beta$ 2-Microglobulin Values Among Healthy Brazilians Using a DPC Immulite Assay Clinics 60: 47-50
3. Christos P. Argyropoulos et al. (2017) Rediscovering Beta-2 Microglobulin as a Biomarker across the Spectrum of Kidney Diseases. Frontiers in Medicine 4 (73), 1-25
4. Miyata, T., Inagi, R., Wada, Y., Ueda, Y., Iida, Y., Takahashi, M., Taniguchi, N., Maeda, K. (1994) Glycation of Human beta.2-Microglobulin in Patients with Haemodialysis-Associated Amyloidosis: Identification of the Glycated Sites Biochemistry, 33: 12215-12221

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<b>Purity</b>	>98% pure or >40% pure
<b>Stability &amp; Formulation</b>	Supplied Lyophilised - Store at 2-8°C
<b>SDS PAGE &amp; HPLC</b>	
<b>Dispensations</b>	P122-1 – 1mg / 10mg / 100mg P122-2 – 1mg / 10mg / 50mg

**ORDERING DETAILS – USE THE FOLLOWING CODES WHEN ORDERING**

Product	Code	Description
Beta-2-microglobulin	P122-1	> 98% pure   supplied Lyophilised   sourced from Human Urine
Beta-2-microglobulin	P122-2	> 40% pure   supplied Lyophilised   sourced from Human Urine

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