Uromodulin Human NATIVE (Human urine)

Product Data Sheet

Type: Native
Source: Human urine
Species: Human
Other names: Tamm-Horsfall urinary glycoprotein, THP, UMOD

Cat. No.:

RD172163100	(0.1 mg)

Description

Native protein isolated from human urine, 590 AA, 64,265 kDa (calculated without glycosylation). Protein identity confirmed by LC-MS/MS.

Introduction to the Molecule

Uromodulin (Tamm-Horsfall protein, UMOD) is approx. 85-kDa glycoprotein that is produced in the thick ascending limb of Henle´s loop and early distal convoluted tubules of the nephron. It is a transmembrane protein, which is secreted into the urine through proteolytic cleavage of the glycosylphosphatidylinositol (GPI) anchor. It belongs to the GPI family. Healthy individuals excrete tens of miligrams of uromodulin per day, making in the most abundant protein in the urine. Uromodulin modulates cell adhesion and signal transduction by interacting with cytokines and it inhibits the aggregation of calcium crystals. By reducing calcium oxalate precipitation, uromodulin plays a protective role with respect to renal stone formation as demonstrated by recent studies on THP- deficient mice prone to nephrolithiasis. THP acts as a host defense factor against urinary tract infections induced by uropathogens such as Esherichia coli, Staphylococcus saphrophyticus, Proteus mirabilis and Klebsiela pneumonie. Uromodulin binds to type 1 fimbriae of Escherichia coli and thereby blocks colonization of urothelial cells. Tamm-Horsfall protein interacts with other molecules and cells including IL-1, IL-2, TNF, IgG, neuthrophils, lymphocytes and monocytes. Binding of uromodulin to neutrophils induces synthesis of IL-8, provokes the respiratory burst and degranulation and stimulates chemotaxis and phagocytosis. Recently, genome-wide association studies identified uromodulin as a risk factor for chronic kidney disease and hypertension. Mutations in the Uromodulin gene are associated with three autosomal dominant tubulo-interstitial nephropathies such as familial juvenile hyperuricemic nephropathy (FJHN), medullary cystic kidney disease (MCKD2) and glomerulocystic kidney disease (GCKD). These disorders are characterized by juvenile onset of hyperuricemia, gout and progressive renal failure.

Research topic

Renal disease

Amino Acid Sequence

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DTSEARWCSE CHSNATCTED EAVTTCTCQE GFTGDGLTCV DLDECAIPGA HNCSANSSCV NTPGSFSCVC PEGFRLSPGL
GCTDVDECAE PGLSHCHALA TCVNVVGSYL CVCPAGYRGD GWHCECSPGS CGPGLDCVPE GDALVCADPC QAHRTLDEYW
RSTEYGEGYA CDTDLRGWYR FVGQGGARMA ETCVPVLRCN TAAPMWLNGT HPSSDEGIVS RKACAHWSGH CCLWDASVQV
KACAGGYYVY NLTAPPECHL AYCTDPSSVE GTCEECSIDE DCKSNNGRWH CQCKQDFNIT DISLLEHRLE CGANDMKVSL
GKCQLKSLGF DKVFMYLSDS RCSGFNDRDN RDWVSVVTPA RDGPCGTVLT RNETHATYSN TLYLADEIII RDLNIKINFA
CSYPLDMKVS LKTALQPMVS ALNIRVGGTG MFTVRMALFQ TPSYTQPYQG SSVTLSTEAF LYVGTMLDGG DLSRFALLMT
NCYATPSSNA TDPLKYFIIQ DRCPHTRDST IQVVENGESS QGRFSVQMFR FAGNYDLVYL HCEVYLCDTM NEKCKPTCSG
TRFRSGSVID QSRVLNLGPI TRKGVQATVS
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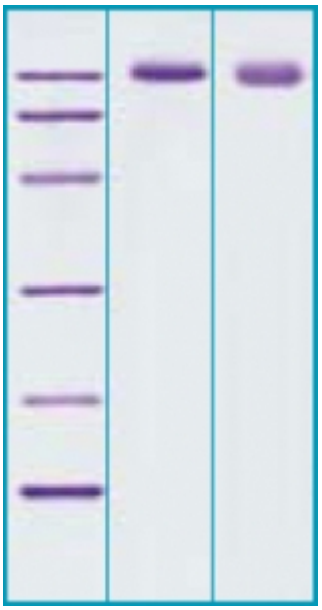
Source

Human urine

Purity

>95%

SDS-PAGE gel



12% SDS-PAGE separation of Human Uromodulin
1. M.W. marker - 14, 21, 31, 45, 66, 97 kDa
2. reduced and heated sample, 2.5µg / lane
3. non-reduced and non-heated sample, 2.5µg / lane

Endotoxin

< 1.0 EU/ug

Formulation

Filtered (0.4 µm) and lyophilized from 0.5 mg/mL in deionized water.

Reconstitution

Add deionized water to prepare a working stock solution of approximately 0.5 mg/mL and let the lyophilized pellet dissolve completely. Product is not sterile! Please filter the product by an appropriate sterile filter before using it in the cell culture.

Shipping

At ambient temperature. Upon receipt, store the product at the temperature recommended below.

Storage, Stability/Shelf Life

Store lyophilized protein at -80°C. Lyophilized protein remains stable until the expiry date when stored at -80°C. Aliquot reconstituted protein to avoid repeated freezing/thawing cycles and store at -80°C for long term storage. Reconstituted protein can be stored at 4°C for a limited period of time; it does not show any change after one week at 4°C.

Quality Control Test

BCA to determine quantity of the protein.
SDS PAGE to determine purity of the protein.
Gel filtration chromatography to determine purity and oligomeric state of the native protein.
LAL to determine quantity of endotoxin.

Applications

ELISA, Western blotting

Note

All donors of urine samples used for protein preparation were tested and found negative for HBsAg, anti-HCV, HIV Ag/Ab, and syphilis. Since no test can absolutely assure the absence of all infectious agents, this product should be handled as a potential biohazard. This product is intended for research use only.

References to this Product

- Jiang Y, Harvey S, Nelsestuen G. *Analysis of urinary albumin, uromodulin and transferrin by multiple reaction monitoring*. CKD Biomarkers Consortium Qual. 2013;:17-27

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