PRODUCT INFORMATION

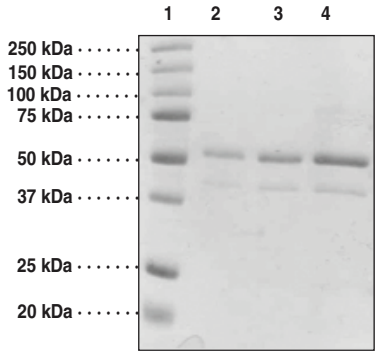
Glucokinase (human liver recombinant)

Item No. 10990

Overview and Properties

Synonyms:	ATP:D-Hexose 6-Phosphotransferase GCK, Hexokinase D, Human Hexokinase IV isoform 2
Source:	Recombinant human C-terminal FLAG-tagged protein expressed in *E. coli*, full-length
Uniprot No.:	P35557
Molecular Weight:	53.2 kDa
Storage:	-80°C (as supplied)
Stability:	≥6 months
Purity:	***batch specific*** (estimated by SDS-PAGE)
Supplied in:	***batch specific***
Protein Concentration:	***batch specific*** mg/ml

Image



Lane 1: MW Markers
Lane 2: Glucokinase (1.25 µg)
Lane 3: Glucokinase (2.5 µg)
Lane 4: Glucokinase (5 µg)

Representative gel image shown; actual purity may vary between each batch.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent *via* email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

Glucokinase (GCK) is an enzyme that catalyses the ATP-dependent phosphorylation of glucose to produce glucose-6-phosphate. This is the first and rate-limiting step in the glycolytic pathway. GCK was initially described in liver but is present in other tissues as well, such as pancreatic B cells, neurons, the pituitary, and endocrine cells of the gut.[1] Unlike other members of the hexokinase family (human hexokinases I-III), GCK has a high S0.5 value for glucose, the concentration giving half maximal activity. The S0.5 value of GCK for glucose is 5-8 mM, which is near the normal fasting blood glucose levels of 3.9-5.5 mM. In contrast, hexokinases I-III have S0.5 values for glucose in the range of 20-130 µM.[2] The distribution of GCK-expressing cells and its sensitivity to glucose is believed to play a central role in maintaining glucose homeostasis. Mutations of the glucokinase gene are associated with non-insulin-dependent (type 2) diabetes mellitus (NIDDM).[3] The kinetic defects associated with glucokinase mutations include reduced catalytic activity, increased KM for glucose, and/or increased KM for ATP.[4] GCK activity in hepatocytes is responsible for regulating glycogen synthesis in response to changes in the ambient glucose concentrations.[5]

References

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2. Mahalingam, B., Cuesta-Munoz, A., Davis, E.A., *et al.* Structural model of human glucokinase in complex with glucose and ATP. *Diabetes* **48**, 1698-1705 (1999).
3. Tahrani, A.A., Bailey, C.J., Del Prato, S., *et al.* Management of type 2 diabetes: New and future developements in treatment. *New Horizons* **6736(11)**, 60207-60209 (2011).
4. Gidh-Jain, M., Takeda, J., Xu, L.Z., *et al.* Glucokinase mutations associated with non-insulin-dependent (type 2) diabetes mellitus have decreased enzymatic activity: Implications for structure/function relationships. *Proc. Natl. Acad. Sci. USA* **90**, 1932-1936 (1993).
5. Matschinsky, F.M. Regulation of pancreatic b-cell glucokinase. *Diabetes* **51(Suppl. 3)**, S394-S404 (2002).

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