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**Product Data Sheet**

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Product Name: Humanin  
Cat. No.: GC18324

**Chemical Properties**

Cas. No. 330936-69-1

Chemical Name L-methionyl-L-alanyl-L-prolyl-L-arginylglycyl-L-phenylalanyl-L-seryl-L-cysteinyl-L-leucyl-L-leucyl-L-leucyl-L-leucyl-L-threonyl-L-seryl-L- $\alpha$ -glutamyl-L-isoleucyl-L- $\alpha$ -aspartyl-L-leucyl-L-prolyl-L-valyl-L-lysyl-L-arginyl-L-arginyl-L-alanine

SMILES N/A

Formula  $C_{119}H_{204}N_{34}O_{32}S_2$  M.Wt 2687.2

Solubility DMSO : 100 mg/mL (37.21 mM; Need ultrasonic) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure

**Protocol****Cell experiment [1]:**

Cell lines KGN cells

Preparation Method Cells were incubated with Humanin (1 uM) for 24 h. Cell viability was assessed by MTT reduction assay.

Reaction Conditions Humanin (1 uM) for 24 h

**Caution: Product has not been fully validated for medical applications. For research use only.**

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Applications	Humanin increased cell viability. HN decreased the percentage of hypodiploid KGN cells as well as the percentage of apoptotic KGN cells.
<b>Animal experiment [2]:</b>	
Animal models	Nine-week-old male ICR mice
Preparation Method	On the day of the test, the mice were intraperitoneally (i.p.) injected with a peptide solution (S14G- Humanin 200 nM, 100 µl/mouse) or vehicle (sterile endotoxin-free water) and returned to their home cage.
Dosage form	S14G- Humanin 200 nM, 100 µl/mouse
Applications	Humanin may be involved in the response of HLECs to oxidative stress, and that Humanin expression was significantly upregulated under oxidative stress conditions.

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### References:

- [1]. Marvaldi C, Martin D, et,al.  
Mitochondrial humanin peptide acts as a cytoprotective factor in granulosa cell survival. *Reproduction*. 2021 Apr 20;161(5):581-591. doi: 10.1530/REP-20-0197. PMID: 33764899.
- [2]. Murakami M, Nagahama M, et,al.  
Humanin ameliorates diazepam-induced memory deficit in mice. *Neuropeptides*. 2017 Apr;62:65-70. doi: 10.1016/j.npep.2016.10.008. Epub 2016 Oct 29. PMID: 27814910.

### Background

Humanin (HN) is a natural short mitochondrial polypeptide with antiapoptotic and neuroprotective effects<sup>[2]</sup>. Humanin protect cells against various diseases, including oxidative stress and cytotoxicity induced by various stimuli<sup>[3]</sup> with broad-spectrum activity on pancreas, brain, testis, and heart<sup>[4]</sup>. Humanin and its analogs could be used as good therapeutic targets against neuroprotective and neurodegenerative diseases<sup>[1]</sup>.

Humanin increased cell viability. HN decreased the percentage of hypodiploid KGN cells as well as the percentage of apoptotic KGN cells. Humanin could be considered a pro-survival factor in this tumor cell line<sup>[5]</sup>. Humanin may be involved in the response of HLECs to oxidative stress, and that HN expression was significantly upregulated under oxidative stress conditions. Furthermore, exogenous HN reduced intracellular ROS content and mitochondrial damage, and enhanced mitochondrial biosynthesis; however, this protection was lost in an endogenous Humanin knockdown cell model<sup>[6]</sup>. The interaction of Humanin and its receptors (CNTFR, WSX-1, and gp130) could activate the STAT3 signaling pathway via an increase in STAT3 expression and consequently lead to the increase of beta cell survival in the pancreas<sup>[9]</sup>.

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Humanin administration has neuroprotective effects in vitro in human cell culture models and is sufficient to improve cognition in vivo in aged mice<sup>[8]</sup>. To understand the effects of Humanin on brain function, The effect of S14G-HN on diazepam (DZP)-induced memory impairment and anxiety in mice using the object recognition test and zero-maze test. Intraperitoneal injection of S14G-HN reversed the DZP-induced memory deficit, whereas no significant change was observed in behavioral markers of anxiety. S14G- Humanin had no effect on locomotor activity in either test, indicating that S14G-HN did not affect physical functioning or motivation<sup>[7]</sup>.

### References:

- [1]. Hazafa A, Batool A, et,al. Humanin: A mitochondrial-derived peptide in the treatment of apoptosis-related diseases. *Life Sci.* 2021 Jan 1;264:118679. doi: 10.1016/j.lfs.2020.118679. Epub 2020 Oct 29. PMID: 33130077.
- [2]. Salemi M, Ridolfo F, et,al.Humanin gene expression in fibroblast of Down syndrome subjects. *Int J Med Sci.* 2020 Jan 18;17(3):320-324. doi: 10.7150/ijms.39145. PMID: 32132866; PMCID: PMC7053358.
- [3]. Luciano F, Zhai D, et,al.Cytoprotective peptide humanin binds and inhibits proapoptotic Bcl-2/Bax family protein BimEL. *J Biol Chem.* 2005 Apr 22;280(16):15825-35. doi: 10.1074/jbc.M413062200. Epub 2005 Jan 20. PMID: 15661735.
- [4]. Paharkova V, Alvarez G, et,al. Rat Humanin is encoded and translated in mitochondria and is localized to the mitochondrial compartment where it regulates ROS production. *Mol Cell Endocrinol.* 2015 Sep 15;413:96-100. doi: 10.1016/j.mce.2015.06.015. Epub 2015 Jun 23. PMID: 26116236.
- [5]. Marvaldi C, Martin D, et,al. Mitochondrial humanin peptide acts as a cytoprotective factor in granulosa cell survival. *Reproduction.* 2021 Apr 20;161(5):581-591. doi: 10.1530/REP-20-0197. PMID: 33764899.
- [6]. Yang H, Cui Y, et,al.Cytoprotective role of humanin in lens epithelial cell oxidative stress?induced injury. *Mol Med Rep.* 2020 Aug;22(2):1467-1479. doi: 10.3892/mmr.2020.11202. Epub 2020 Jun 2. PMID: 32627019; PMCID: PMC7339735.
- [7]. Murakami M, Nagahama M, et,al. Humanin ameliorates diazepam-induced memory deficit in mice. *Neuropeptides.* 2017 Apr;62:65-70. doi: 10.1016/j.npep.2016.10.008. Epub 2016 Oct 29. PMID: 27814910.
- [8]. Yen K, Wan J, et,al.Humanin Prevents Age-Related Cognitive Decline in Mice and is Associated with Improved Cognitive Age in Humans. *Sci Rep.* 2018 Sep 21;8(1):14212. doi: 10.1038/s41598-018-32616-7. PMID: 30242290; PMCID: PMC6154958.

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[9] .Charununtakorn ST, Shinlapawittayatorn K, et,al.Potential Roles of Humanin on Apoptosis in the Heart. Cardiovasc Ther. 2016 Apr;34(2):107-14. doi: 10.1111/1755-5922.12168. PMID: 26667157.

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