Recombinant ucGRP Protein

Human recombinant non-carboxylated GRP protein (ucGRP)

Product Snapshot

Catalog #	PTUC10
Source	Human recombinant (E. coli)
Form	Lyophilized
Purity	>99% (HPLC, SDS-PAGE)
Molecular weight	~14 kDa (SDS-PAGE)
Quantity	10 µg
Storage	-20°C

Recombinant reference protein: Non-carboxylated (ucGRP) human GRP, expressed in E. coli, >99% pure. Suitable as a non-carboxylated GRP standard or control in Western blot, immunoassays and functional studies.

Background

GRP (Gla-rich Protein) is the most recently identified member of the vitamin K-dependent protein (VKDP) family, with 15 putative γ-carboxyglutamic acid (Gla) residues in humans. It inhibits calcification in the cardiovascular and articular systems, modulates calcium availability in the extracellular matrix, and acts as an anti-inflammatory agent. While γ-carboxylation is important for its calcification-inhibitory function, its anti-inflammatory activity is largely independent of carboxylation. This product is the recombinant non-carboxylated form (ucGRP), supplied as a reference protein for GRP research.

Recommended Use

Provided as a non-carboxylated GRP (ucGRP) reference protein for use as a standard or control.

- Standard or control in Western blot, immunoassays and functional studies

Not recommended for:

- *Use as a γ-carboxylated GRP standard (this is the non-carboxylated form)*
- *Quantitative assays without a validated standard curve*

Specifications

Expression: Recombinant human non-carboxylated Gla-rich protein (ucGRP) expressed in *E. coli*. The recombinant protein comprises an N-terminal His_6 tag, V5 epitope, TEV protease recognition site, and the 74-aa mature human GRP sequence (107 aa total).

Amino Acid sequence:

Molecular weight: Approximately 14 kDa by SDS-PAGE.

Accession: GenBank JX16986.

Purity: >99% by HPLC profile and SDS-PAGE analysis.

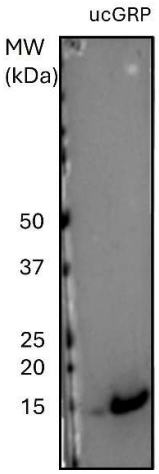

Figure 1. SDS-PAGE analysis of 10 µg purified recombinant ucGRP following RP-HPLC purification.

Formulation

Form: Lyophilized from the final RP-HPLC purification buffer containing residual trifluoroacetic acid (TFA).

Usage

Reconstitution: Add a minimum of 25 µL sterile protease-free water to obtain a recommended maximum concentration of 0.2 µg/µL. Reconstitute by gentle pipetting followed by gentle rotation at 4°C for at least 4 hours. Avoid vigorous mixing.

NOTE: Recommended maximum reconstitution concentration: 0.2 µg/µL. Higher concentrations have not been validated and may reduce protein recovery.

Storage & Handling

Shipment: Room temperature.

Storage: Store at -20°C upon arrival. Once reconstituted, aliquot if appropriate and avoid repeated freeze-thaw cycles.

Selected References

1. Viegas CS, Herfs M, Rafael MS, Enriquez JL, Teixeira A, Maria VL, João A, Cavaco S, Ferreira A, Serra M, Theuwissen E, Vermeer C, Simes DC (2014). “Gla-rich protein is a potential new vitamin K target in cancer: evidences for a direct GRP-mineral interaction”. Biomed Res Int. 2014:340216. doi:10.1155/2014/340216. (describes the recombinant ucGRP)
2. Viegas CS, Rafael MS, Enriquez JL, Teixeira A, Vitorino R, Luís IM, Costa RM, Santos S, Cavaco S, Neves J, Macedo AL, Willems BA, Vermeer C, Simes DC (2015). “Gla-rich protein acts as a calcification inhibitor in the human cardiovascular system”. Arterioscler Thromb Vasc Biol. 35(2):399-408. doi:10.1161/ATVBAHA.114.304823.

3. Cavaco S, Viegas CSB, Rafael MS, Ramos A, Magalhães J, Blanco FJ, Vermeer C, Simes DC (2016). “Gla-rich protein is involved in the cross-talk between calcification and inflammation in osteoarthritis”. Cell Mol Life Sci. 73(5):1051-1065. doi:10.1007/s00018-015-2033-9.
4. Viegas CSB, Costa RM, Santos L, Videira PA, Silva Z, Araújo N, Macedo AL, Matos AP, Vermeer C, Simes DC (2017). “Gla-rich protein function as an anti-inflammatory agent in monocytes/macrophages: implications for calcification-related chronic inflammatory diseases”. PLoS ONE 12(5):e0177829. doi:10.1371/journal.pone.0177829.
5. Viegas CSB, Santos L, Macedo AL, Matos AP, Silva AP, Neves PL, Staes A, Gevaert K, Morais R, Vermeer C, Schurgers L, Simes DC (2018). “Chronic kidney disease circulating calciprotein particles and extracellular vesicles promote vascular calcification: a role for GRP (Gla-rich protein)”. Arterioscler Thromb Vasc Biol. 38(3):575-587. doi:10.1161/ATVBAHA.117.310578.
6. Viegas CSB, Araújo N, Carreira J, Pontes JF, Macedo AL, Vinhas M, Moreira AS, Faria TQ, Grenha A, de Matos AA, Schurgers L, Vermeer C, Simes DC (2022). “Nanoencapsulation of Gla-Rich Protein (GRP) as a novel approach to target inflammation”. Int J Mol Sci. 23(9):4813. doi:10.3390/ijms23094813.

Related Products

Catalog #	Product	Use Case
PA:T50	C-Term GRP Polyclonal Antibody	Total GRP (all forms)