

## DESCRIPTION

<b>Source</b>	Chinese Hamster Ovary cell line, CHO-derived	
	Human CG $\beta$ (Ser21-Gln165) Accession # P01233	
	Human CG $\alpha$ (Ala25-Ser116) Accession # P01215	
	N-terminus	C-terminus

**N-terminal Sequence Analysis** Ser21 (CG  $\beta$ ) & Ala25 (CG  $\alpha$ )

**Structure / Form** Noncovalently-linked heterodimer

**Predicted Molecular Mass** 15.5 kDa (CG  $\beta$ ) & 10.2 kDa (CG  $\alpha$ )

## SPECIFICATIONS

**SDS-PAGE** 27-32 kDa & 20-22 kDa, reducing conditions

**Activity** Measured by its ability to induce cAMP accumulation in MLTC-1 mouse Leydig tumor cells. Rebois, R.V. *et al.* (1982) J. Cell Biol. **94**:70. The ED<sub>50</sub> for this effect is 0.07-0.42 ng/mL.

**Endotoxin Level** <0.01 EU per 1  $\mu$ g of the protein by the LAL method.

**Purity** >95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.

**Formulation** Lyophilized from a 0.2  $\mu$ m filtered solution in PBS. See Certificate of Analysis for details.

## PREPARATION AND STORAGE

**Reconstitution** Reconstitute at 100  $\mu$ g/mL in PBS.

**Shipping** The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.

**Stability & Storage** Use a manual defrost freezer and avoid repeated freeze-thaw cycles.

- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

## BACKGROUND

HCG (human chorionic gonadotropin) is a member of the glycoprotein hormone (GPH) family within the cystine knot growth factor superfamily (1-5). It is a heterodimer of a 23-32 kDa unique subunit, CG $\beta$ , with a 14-22 kDa alpha subunit, CG $\alpha$  (common glycoprotein hormone alpha) that is shared with GPH family members lutropin (LH), follitropin (FSH) and thyroid stimulating hormone (TSH) (1, 2). CG $\beta$  occurs only in higher primates, while the most closely related hormone, LH $\beta$ , is expressed in all mammals (6). Human CG $\beta$  and LH $\beta$  share a receptor, LH/CG-R or LHR, and show 86% aa sequence identity between aa 21 and 133, before diverging into a 32 aa, highly O-glycosylated (CG $\beta$ ) or 8 aa (LH $\beta$ ) C-terminal tail (2). Mature human CG $\alpha$  shares 69%-73% aa identity with dog, rabbit, rat, mouse, cow, sheep, pig, cat and horse CG $\alpha$ . Each subunit form a cystine knot structure with three disulfide bridges (5). A "seat-belt" loop of CG $\beta$  wraps around CG $\alpha$ , stabilizing subunit non-covalent association and conferring receptor selectivity (5). CG $\beta$  is encoded by six clustered, nonallelic genes that encode identical, but differentially expressed, proteins (2, 7). HGC produced by cytotrophoblast cells in early pregnancy is hyperglycosylated and sialylated, increasing its acidity and half-life (3, 4, 8). Forms with lower glycosylation are produced by syncytiotrophoblasts in continuing pregnancy, and in small amounts by the pituitary where it is also sulfated (4, 8). Free, variably glycosylated CG $\beta$  subunits are also reported (3, 4). The primary role of HCG is to act as an autocrine factor to establish pregnancy and control placental growth and function. HCG has also been shown to induce the angiogenic factor, EG-VEGF/PK1, and contribute to immune privilege by increasing circulating regulatory T cells and anti-inflammatory cytokines IL-10 and IL-27, via cAMP signaling (9, 10). In addition to pregnancy, large amounts of HCG are produced in gestational trophoblastic diseases such as choriocarcinoma and hydatiform mole (3, 4). HCG may also be produced by ovarian and testicular germ cell tumors and advanced cancers that have dedifferentiated (3, 4).

## References:

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