

## DESCRIPTION

**Source** *E. coli*-derived  
Ala61-Gly156  
Accession # O60542

**N-terminal Sequence Analysis** Ala61

**Structure / Form** Disulfide-linked homodimer

**Predicted Molecular Mass** 10.3 kDa (monomer)

## SPECIFICATIONS

**Activity** Measured in a cell proliferation assay using TT human medullary thyroid cancer cells.  
The ED<sub>50</sub> for this effect is typically 4-16 ng/mL.

**Endotoxin Level** <1.0 EU per 1 µg of the protein by the LAL method.

**Purity** >95%, by SDS-PAGE under reducing conditions and visualized by silver stain.

**Formulation** Lyophilized from a 0.2 µm filtered solution in Acetonitrile and TFA. See Certificate of Analysis for details.

## PREPARATION AND STORAGE

**Reconstitution** Reconstitute at 100 µg/mL in sterile 4 mM HCl.

**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

Persephin is a secreted protein belonging to the glial cell line-derived neurotrophic factor (GDNF) family of the TGF-β superfamily. It shares 38 - 46% amino acid (aa) identity with family members GDNF, neurturin and artemin. Persephin is expressed at very low levels in most tissues (1). The 156 aa, 10 - 12 kDa mature protein contains a signal sequence, a pro-domain and a 96 aa mature sequence with several cysteines that are conserved among family members. It circulates as an unglycosylated disulfide-linked homodimer. Mature human Persephin shares 81% and 80%, 89% and 87% amino acid sequence identity with mouse, rat, bovine and canine Persephin, respectively. Like other GDNF family members, Persephin acts through engagement of GRFα4, a glycosylphosphatidylinositol (GPI)-linked GDNF receptor family (GRF) member that signals through the receptor tyrosine kinase RET. Persephin is reported to promote both the survival and growth of central dopaminergic and motor neurons, and kidney development (1). These effects are correlated with the expression patterns of GFRα4, and RET (2, 3). Functional GFRα4 isoforms are found only in thyroid, adrenal medulla and portions of the central nervous system, and include GPI-linked, transmembrane and soluble forms (3, 4). *In vitro*, Persephin promotes survival only in neurons which coexpress GPI-linked GFRα4 with RET (2, 5). This effect does not show a strong correlation to the recruitment of RET in lipid rafts seen with other GDNF family members (6). Disruption of the Persephin gene results in mice that are morphologically normal but have more damage and less effective repair after central nervous system insult that stimulates a stroke. Microinjection of Persephin prior to treatment protects against damage in both wild-type and mutant mouse brains, but surprisingly, high doses of Persephin are detrimental (7).

## References:

1. Milbrandt, J. *et al.* (1998) *Neuron* **20**:245.
2. Lindahl, M. *et al.* (2001) *J. Biol. Chem.* **276**:9344.
3. Lindahl, M. *et al.* (2000) *Mol. Cell. Neurosci.* **15**:522.
4. Akerud, P. *et al.* (2002) *Mol. Cell. Neurosci.* **21**:205.
5. Enokido, Y. *et al.* (1998) *Current Biol.* **8**:1019.
6. Yang, J. *et al.* (2004) *FEBS Lett.* **569**:267.
7. Tomac, A. C. *et al.* (2002) *Proc. Natl. Acad. Sci. USA* **99**:9521.