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Product Information

Heregulin-α, EGF Domain, human recombinant, expressed in *E. coli*

Catalog Number **H5529**
Storage Temperature –20 °C

Synonyms: HRG-α, NRG-1-α

Product Description

Heregulin-α (HRG) and its rat homolog neu differentiation factor (NDF) were initially isolated as specific activators of the tyrosine kinase encoded by the erbB2/HER-2/neu proto-oncogene,[1] but the ability of HRG to phosphorylate HER2 was subsequently discovered to be an anomaly. It is now believed that HRG is the ligand for HER3 and HER4 receptors.

Through alternative splicing or the use of alternative promoters, Nrg-1 encodes more than 14 soluble or transmembrane proteins. The extracellular domain of the transmembrane NRG1 isoforms can be proteolytically cleaved to release soluble growth factors. The α or β-splice variants differ in their C-terminal region. All NRG1 isoforms contain an EGF-like domain that is required for their direct binding to the ErbB3 or ErbB4 receptor tyrosine kinases.[2]

NRG1 isoforms can be classified into three major subtypes. Type I (Neu Differentiation Factor, NDF; Heregulin, HRG; Acetylcholine Receptor Inducing Activity; ARIA) and type II (Glial Growth Factor, GGF). NRG1 isoforms have an immunoglobulin (Ig)-like domain N-terminal to the EGF-like domain. Type I NRG1 differs from type II NRG1 by having a glycosylation-rich domain between the Ig-like and the EGF-like domains. Type III NRG1 (Sensory and Motor neuron-Derived Factor) lacks the Ig-like domain but has a cysteine rich domain (CRD) instead. NRG1 isoforms show distinct spatial and temporal expression patterns. These proteins play important roles during development of both the nervous system and the heart and a linkage has been postulated for the onset of schizophrenia due to its role in neurodevelopment and neuronal migration.[3,4]

They have been shown to regulate the selective expression of neurotransmitter receptors in neurons and at the neuromuscular junction, and to promote the differentiation and development of Schwann cells from neural crest stem cells. Heregulin-α is also mitogenic for epithelial cells[5] and inhibits the proliferation of tumor cells.[6] The predicted molecular mass is ~7 kDa.

This product is lyophilized from a 0.2 μm filtered solution in phosphate buffered saline (pH 7.4) containing 50 μg bovine serum albumin per 1 μg as a carrier protein.

Purity: ≥97% (SDS-PAGE)

The biological activity of human, recombinant heregulin-α is measured by its ability to inhibit cell proliferation of MCF-7 human breast cancer cells. The EC_{50} is defined as the effective concentration of growth factor that elicits a 50% inhibition in cell growth in a cell based bioassay.

Endotoxin: ≤0.01 EU (endotoxin unit) per 1 μg of the cytokine (LAL method)

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Reconstitute the contents of the vial using 25 μl of 0.2 μm filtered PBS containing at least 0.1% bovine serum albumin. The reconstituted product may be stored at 2–8 °C for up to one month. For prolonged storage, freeze in working aliquots –20 °C. Avoid repeated freezing and thawing.

Storage/Stability

Store the lyophilized product at –20 °C for no more than 6 months.

References

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3. Esper, R. et al., Neuregulins: Versatile growth and differentiation factors in nervous system development and human disease. Brain Res. Rev., 51, (2006).
4. Toscato, S. Association Between the Neuregulin 1 Gene and Schizophrenia: A Systematic Review. Schizophr. Bull., (2005).
5. Marchionni, M. et al., Glial growth factors are alternatively spliced erbB2 ligands expressed in the nervous system. Nature, **362**, 312 (1993).
6. Prigent, S., and Lemoine, N.R., The type 1 (EGFR-related) family of growth factor receptors and their ligands. Prog. Growth Factor Res., **4**, 1 (1992).

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