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## Product Data Sheet

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Product Name: GPHA2 Human  
 Cat. No.: GP21263  
 Batch No.: 1

### Product Data

Purity	>98%	Source	Escherichia Coli.
Physical Appearance	solid	Shipping Condition	Shipped at Room temp.
Synonyms	GPA2; GPHA2; ZSIG51; Glycoprotein hormone alpha-2; MGC126572.		
Amino Acid Sequence	MRGSHHHHHH GMAS QEAVIPG CHLHPFNVTV RSDRQGTCQG SHVAQACVGH CESSAFPSRY SVLVASGYRH NITSVSQCCT ISGLKKVKVQ LQCVGSRREE LEIFTARACQCDMCRLSRY.		
Solubility	It is recommended to add 0.1M Acetate buffer pH4 to prepare a working stock solution of ~ 0.5 mg/ml and let the lyophilized pellet dissolve completely. For conversion into higher pH value, we recommend intensive dilution by relevant buffer to a concentration of 10µg/ml. In higher concentrations the solubility of this protein is limited. Product is not sterile! Please filter the product by an appropriate sterile filter before using it in the cell culture.		
Formulation	GPHA2 filtered (0.4µm) and lyophilized from 0.5mg/ml in 0.05M Acetate buffer pH 4.		

### Introduction

Human thyrostimulin ranks among the glycoprotein hormone family. These hormones consist of two subunits, the common alpha- and specific beta-subunits, which associate noncovalently to form a heterodimer. The alpha-subunit combines with four distinct beta-subunits giving rise to four biologically active hormones in human: FSH, LH, TSH, and CG. FSH, LH, and TSH, mainly expressed in the anterior pituitary, are essential for coordinated endocrine regulation in the hypothalamus- pituitary axis and show to activate specific G protein-coupled receptors in the thyroid (TSH receptor) and gonads (LH and FSH receptors), respectively. The heterodimeric glycoprotein hormones have only been identified in vertebrates and are highly conserved in organisms from primitive rayfin fish (Chondrostei) to human in both primary sequences and functional

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

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characteristics. Corticotroph-derived glycoprotein hormone (CGH), also referred to as thyrostimulin, is a noncovalent heterodimer of glycoprotein hormone alpha 2 (GPHA2) and glycoprotein hormone beta 5 (GPHB5). Recombinant A2/B5 heterodimeric glycoproteins activates human TSH receptors, but not LH and FSH receptors, and shows high affinity to TSH receptors in a radioligand receptor assay. The heterodimer also stimulates cAMP production and thymidine incorporation by cultured thyroid cells and increases serum thyroxine levels in TSH-suppressed rats in vivo. This new heterodimeric glycoprotein hormone was named as thyrostimulin based on its thyroid-stimulating activity. The expression of thyrostimulin in the anterior pituitary known to express TSH receptors suggested a paracrine mechanism.

### Stability

Lyophilized Thyrostimulin although stable at room temperature for 3 weeks, should be stored desiccated below  $-18^{\circ}\text{C}$ . Upon reconstitution GPHA2 should be stored at  $4^{\circ}\text{C}$  between 2-7 days and for future use below  $-18^{\circ}\text{C}$ . For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA). Please prevent freeze-thaw cycles.

### Background

GPHA2 Human Recombinant produced in E. Coli is a single, non-glycosylated, polypeptide chain containing 120 amino acids and having a total molecular mass of 13.28 kDa. The Thyrostimulin contains His tag which consists of 14 additional amino acids. The amino acid sequence of the recombinant human Thyrostimulin beta subunit is 100% homologous to the amino acid sequence of the human Thyrostimulin beta subunit without signal sequence. (N-terminal 24AA). Thyrostimulin is purified by proprietary chromatographic techniques.

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