

# Product data sheet



MedKoo Cat#: 596723 Name: Glutamic Acid CAS: 56-86-0 Chemical Formula: C <sub>5</sub> H <sub>9</sub> NO <sub>4</sub> Exact Mass: 147.0532 Molecular Weight: 147.13	
Product supplied as: Powder	
Purity (by HPLC): ≥ 98%	
Shipping conditions: Ambient temperature	
Storage conditions: Powder: -20°C 3 years; 4°C 2 years. In solvent: -80°C 3 months; -20°C 2 weeks.	

## 1. Product description:

Glutamic Acid is a non-essential amino acid naturally occurring in the L-form. Glutamic acid is the most common excitatory neurotransmitter in the CENTRAL NERVOUS SYSTEM.

## 2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under “QC And Documents” section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

## 3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
Water	6.25	42.48

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	6.80 mL	33.98 mL	67.97 mL
5 mM	1.36 mL	6.80 mL	13.59 mL
10 mM	0.68 mL	3.40 mL	6.80 mL
50 mM	0.14 mL	0.68 mL	1.36 mL

## 5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of “Calculator”

## 6. Recommended literature which reported protocols for in vitro and in vivo study

### In vitro study

1. Mendoza-Santiago A, Becerra E, Garay E, Bah M, Berumen-Segura L, Escobar-Cabrera J, Hernández-Pérez A, García-Alcocer G. Glutamic Acid Increased Methotrexate Polyglutamation and Cytotoxicity in a CCRF-SB Acute Lymphoblastic Leukemia Cell Line. *Medicina (Kaunas)*. 2019 Nov 26;55(12):758. doi: 10.3390/medicina55120758. PMID: 31779260; PMCID: PMC6956105.

### In vivo study

1. Jara CP, de Andrade Berti B, Mendes NF, Engel DF, Zanesco AM, Pereira de Souza GF, de Medeiros Bezerra R, de Toledo Bagatin J, Maria-Engler SS, Morari J, Velander WH, Velloso LA, Araújo EP. Glutamic acid promotes hair growth in mice. *Sci Rep*. 2021 Jul 29;11(1):15453. doi: 10.1038/s41598-021-94816-y. PMID: 34326383; PMCID: PMC8322389.

## 7. Bioactivity

### Biological target:

L-Glutamic acid acts as an excitatory transmitter and an agonist at all subtypes of glutamate receptors (metabotropic, kainate, NMDA, and AMPA). L-Glutamic acid shows a direct activating effect on the release of DA from dopaminergic terminals.

### In vitro activity

# Product data sheet



As shown in Figure 2 and Figure 3, the levels of methotrexate pentaglutamate (MTX-PG5) were significantly higher in Acute Lymphoblastic Leukemia cells treated with 20 mM glutamic acid compared with those of cells that were exposed only to MTX and MTX plus 10 mM glutamic acid.

Reference: Medicina (Kaunas). 2019 Nov 26;55(12):758. <https://pubmed.ncbi.nlm.nih.gov/31779260/>

## In vivo activity

---

Surprisingly, 1% and 10% GA (glutamic acid) accelerated hair growth after 14 days of topical treatment (Fig. 3a). Using photomicrographs, this study also showed that GA increased external root sheath across all GA concentrations (Fig. 3b, Supplementary Fig. 1f.) with no hyperkeratosis effect. This study also consistently identified increased BrdU positive cells in the hair follicles and epidermal layer after 14-days of GA topical treatment (Figs. 3c, c,44f).

Reference: Sci Rep. 2021 Jul 29;11(1):15453. <https://pubmed.ncbi.nlm.nih.gov/34326383/>

*Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.*