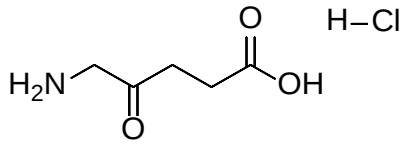
Product data sheet

MedKoo Cat#: 100054 Name: Aminolevulinic Acid HCl CAS#: 5451-09-2 (HCl) Chemical Formula: $C_5H_{10}ClNO_3$ Molecular Weight: 167.59	
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:
Aminolevulinic acid, also known as ALA, is a topically administered metabolic precursor of protoporphyrin IX. After topical administration, aminolevulinic acid (ALA) is converted to protoporphyrin IX (PpIX) which is a photosensitizer. When the proper wavelength of light activates protoporphyrin IX, singlet oxygen is produced, resulting in a local cytotoxic effect. In 1999, FDA approved this drug for for actinic keratosis.

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
DMSO	64.67	385.88
Water	42.0	250.61
Ethanol	10.0	59.67
PBS (pH 7.2)	10.0	59.67
DMF	5.0	29.83

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	5.97 mL	29.83 mL	59.67 mL
5 mM	1.19 mL	5.97 mL	11.93 mL
10 mM	0.60 mL	2.98 mL	5.97 mL
50 mM	0.12 mL	0.60 mL	1.19 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. Shishido Y, Amisaki M, Matsumi Y, Yakura H, Nakayama Y, Miyauchi W, Miyatani K, Matsunaga T, Hanaki T, Kihara K, Yamamoto M, Tokuyasu N, Takano S, Sakamoto T, Honjo S, Hasegawa T, Fujiwara Y. Antitumor Effect of 5-Aminolevulinic Acid Through Ferroptosis in Esophageal Squamous Cell Carcinoma. Ann Surg Oncol. 2021 Jul;28(7):3996-4006. doi: 10.1245/s10434-020-09334-4. Epub 2020 Nov 18. PMID: 33210267.

In vivo study

1. Shishido Y, Amisaki M, Matsumi Y, Yakura H, Nakayama Y, Miyauchi W, Miyatani K, Matsunaga T, Hanaki T, Kihara K, Yamamoto M, Tokuyasu N, Takano S, Sakamoto T, Honjo S, Hasegawa T, Fujiwara Y. Antitumor Effect of 5-Aminolevulinic Acid Through Ferroptosis in Esophageal Squamous Cell Carcinoma. Ann Surg Oncol. 2021 Jul;28(7):3996-4006. doi: 10.1245/s10434-020-09334-4. Epub 2020 Nov 18. PMID: 33210267.

7. Bioactivity

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Biological target: 5-Aminolevulinic Acid HCl is an intermediate in the porphyrin synthesis pathway, used as a photosensitizing agent and a antineoplastic agent.

In vitro activity

Expression of GPX4 and HMOX1 in pathologic specimens of 97 ESCC (esophageal squamous cell carcinoma) patients was examined and real-time polymerase chain reaction (RT-PCR), RNA microarray, and Western blotting analyses were used to evaluate the role of 5-ALA in ferroptosis in vitro. The results showed that upregulation of GPX4 and downregulation of HMOX1 were poor prognostic factors in ESCC. In an RNA microarray analysis of KYSE30, ferroptosis was one of the most frequently induced pathways, with GPX4 suppressed and HMOX1 overexpressed by 5-ALA treatment. Furthermore, 5-ALA led to an increase in lipid peroxidation and exerted an antitumor effect in various cancer cell lines.

Reference: Ann Surg Oncol. 2021 Jul;28(7):3996-4006. https://link.springer.com/article/10.1245%2Fs10434-020-09334-4

In vivo activity

The role of 5-ALA in ferroptosis was evaulated by its effect on an ESCC (esophageal squamous cell carcinoma) subcutaneous xenograft mouse model. In vivo, 5-ALA suppressed GPX4 and overexpressed HMOX1 in tumor tissues and led to a reduction in tumor size.

Reference: Ann Surg Oncol. 2021 Jul;28(7):3996-4006. https://link.springer.com/article/10.1245%2Fs10434-020-09334-4

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.