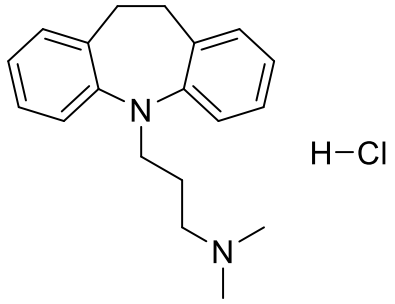
Product data sheet

MedKoo Cat#: 318056 Name: Imipramine HCl CAS: 113-52-0 (HCl) Chemical Formula: $C_{19}H_{25}ClN_2$ Molecular Weight: 316.873	
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:
Imipramine, sold as Tofranil and also known as melipramine, is a tricyclic antidepressant (TCA) of the dibenzazepine group. Imipramine is mainly used in the treatment of major depression and enuresis (inability to control urination).

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
DMF	25.0	78.90
DMSO	62.67	197.77
Ethanol	44.0	138.86
PBS (pH 7.2)	0.5	1.58
Water	62.75	198.03

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	3.16 mL	15.78 mL	31.56 mL
5 mM	0.63 mL	3.16 mL	6.31 mL
10 mM	0.32 mL	1.58 mL	3.16 mL
50 mM	0.06 mL	0.32 mL	0.63 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. Timilsina S, Rajamanickam S, Rao A, Subbarayalu P, Nirzhor S, Abdelfattah N, Viswanadhapalli S, Chen Y, Jatoi I, Brenner A, Rao MK, Vadlamudi R, Kaklamani V. The antidepressant imipramine inhibits breast cancer growth by targeting estrogen receptor signaling and DNA repair events. Cancer Lett. 2022 Aug 1;540:215717. doi: 10.1016/j.canlet.2022.215717. Epub 2022 May 12. PMID: 35568265.
2. Wang Y, Wang X, Wang X, Wu D, Qi J, Zhang Y, Wang K, Zhou D, Meng QM, Nie E, Wang Q, Yu RT, Zhou XP. Imipramine impedes glioma progression by inhibiting YAP as a Hippo pathway independent manner and synergizes with temozolomide. J Cell Mol Med. 2021 Oct;25(19):9350-9363. doi: 10.1111/jcmm.16874. Epub 2021 Sep 1. PMID: 34469035; PMCID: PMC8500960.

In vivo study

1. Yueh PF, Lee YH, Chiang IT, Chen WT, Lan KL, Chen CH, Hsu FT. Suppression of EGFR/PKC-δ/NF-κB Signaling Associated With Imipramine-Inhibited Progression of Non-Small Cell Lung Cancer. Front Oncol. 2021 Oct 26;11:735183. doi: 10.3389/fonc.2021.735183. PMID: 34765548; PMCID: PMC8576332.

2. Chang GR, Hou PH, Wang CM, Lin JW, Lin WL, Lin TC, Liao HJ, Chan CH, Wang YC. Imipramine Accelerates Nonalcoholic Fatty Liver Disease, Renal Impairment, Diabetic Retinopathy, Insulin Resistance, and Urinary Chromium Loss in Obese Mice. Vet Sci. 2021 Sep 9;8(9):189. doi: 10.3390/vetsci8090189. PMID: 34564583; PMCID: PMC8473438.

7. Bioactivity

Biological target:

Imipramine hydrochloride is an orally active tertiary amine tricyclic antidepressant. Imipramine hydrochloride is a Fascin1 inhibitor with antitumor activities. Imipramine also inhibits serotonin transporter with an IC_{50} value of 32 nM. Imipramine hydrochloride stimulates U-87MG glioma cells autophagy and induces HL-60 cell apoptosis. Imipramine hydrochloride shows neuroprotective and immunomodulatory effects.

In vitro activity

To confirm these results in a more physiologically relevant model, this study tested the effect of imipramine treatment in 4T1 isograft model, which closely mimics the aggressive human TNBCs. After 4T1 isograft tumors reached 100 mm3, BALB/c mice were treated with vehicle or 32 mg/kg imipramine for three weeks. Imipramine-treated mice had significantly reduced tumor volumes compared to vehicle-treated 4T1-derived tumors (Supplementary Fig. 1e).

Reference: Cancer Lett. 2022 Aug 1;540:215717. https://pubmed.ncbi.nlm.nih.gov/35568265/

In vivo activity

Results show that the gene expression of COX-2, iNOS, and NF-κB was higher in imipramine-treated mice compared with controls (1.5, 1.8, and 1.2 times higher, respectively; Figure 9b,c, respectively). By contrast, the gene expression of IκBα in imipramine-treated mice was 18% lower than that in controls (Figure 9d). These results indicate that imipramine increased the risk of DR (diabetic retinopathy) by elevating inflammation and glucose uptake.

Reference: Vet Sci. 2021 Sep 9;8(9):189. https://pubmed.ncbi.nlm.nih.gov/34564583/

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.