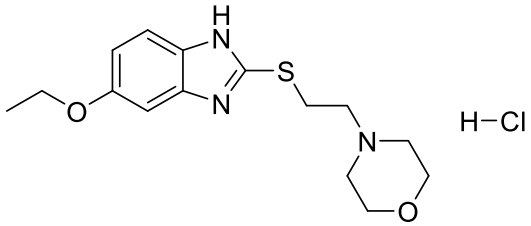
Product data sheet

MedKoo Cat#: 319793 Name: Fabomotizole HCl CAS#: 173352-39-1 (HCl) Chemical Formula: $C_{15}H_{22}ClN_3O_2S$ Exact Mass: 307.1354 Molecular Weight: 343.87	
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:
Fabomotizole, also known as Afobazole, Obenoxazine and CM346, is an anxiolytic drug launched in Russia in the early 2000s. It produces anxiolytic and neuroprotective effects without any sedative or muscle relaxant actions. Its mechanism of action remains poorly defined however, with GABAergic, NGF- and BDNF-release-promoting, MT1 receptor agonism, MT3 receptor antagonism, and sigma agonism suggested as potential mechanisms. Fabomotizole was shown to inhibit MAO-A reversibly and there might be also some involvement with serotonin receptors.

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	50.0	145.4
Ethanol	50.0	145.4

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.91 mL	14.54 mL	29.08 mL
5 mM	0.58 mL	2.91 mL	5.82 mL
10 mM	0.29 mL	1.45 mL	2.91 mL
50 mM	0.06 mL	0.29 mL	0.58 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 Behensky AA, Katnik C, Yin H, Cuevas J. Activation of Sigma Receptors With Afobazole Modulates Microglial, but Not Neuronal, Apoptotic Gene Expression in Response to Long-Term Ischemia Exposure. Front Neurosci. 2019 May 15;13:414. doi: 10.3389/fnins.2019.00414. PMID: 31156357; PMCID: PMC6529844.
2. Voronin MV, Kadnikov IA. Contribution of Sigma-1 receptor to cytoprotective effect of afobazole. Pharmacol Res Perspect. 2016 Nov 7;4(6):e00273. doi: 10.1002/prp2.273. PMID: 28097006; PMCID: PMC5226281.

In vivo study

1. Voronin MV, Vakhitova YV, Tsypysheva IP, Tsypyshev DO, Rybina IV, Kurbanov RD, Abramova EV, Seredenin SB. Involvement of Chaperone Sigma1R in the Anxiolytic Effect of Fabomotizole. Int J Mol Sci. 2021 May 21;22(11):5455. doi: 10.3390/ijms22115455. PMID: 34064275; PMCID: PMC8196847.
2. Kadnikov IA, Verbovaya ER, Voronkov DN, Voronin MV, Seredenin SB. Deferred Administration of Afobazole Induces Sigma1R-Dependent Restoration of Striatal Dopamine Content in a Mouse Model of Parkinson's Disease. Int J Mol Sci. 2020 Oct 15;21(20):7620. doi: 10.3390/ijms21207620. PMID: 33076300; PMCID: PMC7593947.

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7. Bioactivity

Biological target:

Fabomotizole hydrochloride (CM346 hydrochloride) is an anxiolytic drug that produces anxiolytic and neuroprotective effects without any sedative or muscle relaxant actions.

In vitro activity

Experiments were carried out to determine how afobazole affects neuronal and microglial responses to prolonged in vitro ischemia in rat cortical cells. Treatment with afobazole showed a decrease in microglial activation as reflected in the degree of membrane ruffling in response to ATP (Supplementary Figure S1). Application of afobazole (Afob) significantly mitigated microglial cell death by 75 ± 8% when co-incubated with ischemia (Figure 1Aiv,B). Therefore, it was examined how afobazole effects the levels of the death protease, caspase-3, in microglia after ischemia treatment. There was a notable increase in the number of microglia expressing caspase-3 following ischemia (Figure 3Ai,ii) and this upregulation was reduced by afobazole treatment (Figure 3Aiii,iv). Quantification of the images showed that afobazole alone significantly decreased caspase-3 expressing cells by 20 ± 3% relative to the control and diminished the increases in caspase-3 evoked by ischemia by 56 ± 5% (Figure 3B). This study demonstrates that afobazole can reduce microglial toxicity and cell death following prolonged ischemic exposure. These properties make afobazole an attractive drug for treatment of ischemic stroke.

Reference: Front Neurosci. 2019; 13: 414. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6529844/

In vivo activity

To specifically test the hypothesis that fabomotizole could function in a Sigma1R agonist-like manner and provide anxiolytic effects, in vivo experiments were used. Dependence of anxiolytic properties of fabomotizole on Sigma1R was examined in the elevated plus-maze with male BALB/c mice in the presence of known Sigma1R antagonists. Fabomotizole administered at a 2.5 mg/kg dose 30 min prior to EPM exposition (Veh1 + Fab 2.5) led to a significantly higher number of entries into open arms and time spent in the open arms (adj $p < 0.001$) (Figure 1 and Figure 2, Table S1). Administration of BD-1047 (BD-1047 1.0 + Fab 2.5; adj $p < 0.001$) or NE-100 (NE-100 1.0 + Fab 2.5; adj $p < 0.01$) at a 1.0 mg/kg dose 30 min prior to fabomotizole prevented its effect and enhanced the anxiety-like behavior, reducing entries into open arms (Figure 1 and Figure 2, Table S1). Fabomotizole (Veh1 + Fab 2.5) moderately raised the number of total entries (adj $p = 0.045$) (Figure S1, Table S2). Under administration of Sigma1R antagonist BD-1047 (BD-1047 1.0 + Fab 2.5) 30 min prior to fabomotizole, a statistically significant decrease in the number of closed arms entries and the number of total entries occurred (Figure S1, Table S2). Achieved results demonstrate the anxiolytic-like effect of fabomotizole and its elimination by the Sigma1R antagonists BD-1047 (1 mg/kg i.p.) and NE-100 (1 mg/kg i.p.).

Reference: Int J Mol Sci. 2021 Jun; 22(11): 5455. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8196847/

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.