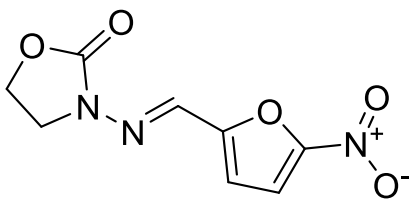
Product data sheet

MedKoo Cat#: 317959 Name: Furazolidone CAS#: 67-45-8 Chemical Formula: $C_8H_7N_3O_5$ Exact Mass: 225.0386 Molecular Weight: 225.16	
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:

Furazolidone is a nitrofuran antibacterial agent. It is a nitrofuran derivative with antiprotozoal and antibacterial activity. Furazolidone binds bacterial DNA which leads to the gradual inhibition of monoamine oxidase. It is marketed by Roberts Laboratories under the brand name Furoxone and by GlaxoSmithKline as Dependal-M.

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	28.0	124.36

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.44 mL	22.21 mL	44.41 mL
5 mM	0.89 mL	4.44 mL	8.88 mL
10 mM	0.44 mL	2.22 mL	4.44 mL
50 mM	0.09 mL	0.44 mL	0.89 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. Yu JG, Ji CH, Shi MH. The anti-infection drug furazolidone inhibits NF-κB signaling and induces cell apoptosis in small cell lung cancer. Kaohsiung J Med Sci. 2020 Dec;36(12):998-1003. doi: 10.1002/kjm2.12281. Epub 2020 Aug 6. PMID: 32767507.
2. Jiang X, Sun L, Qiu JJ, Sun X, Li S, Wang X, So CW, Dong S. A novel application of furazolidone: anti-leukemic activity in acute myeloid leukemia. PLoS One. 2013 Aug 9;8(8):e72335. doi: 10.1371/journal.pone.0072335. PMID: 23951311; PMCID: PMC3739762.

In vivo study

1. Zhang M, Wei J, Shan H, Wang H, Zhu Y, Xue J, Lin L, Yan R. Calreticulin-STAT3 signaling pathway modulates mitochondrial function in a rat model of furazolidone-induced dilated cardiomyopathy. PLoS One. 2013 Jun 20;8(6):e66779. doi: 10.1371/journal.pone.0066779. PMID: 23818963; PMCID: PMC3688564.
2. Ma S, Jin Z, Liu Y, Liu L, Feng H, Li P, Tian Z, Ren M, Liu X. Furazolidone Increases Survival of Mice Exposed to Lethal Total Body Irradiation through the Antiapoptosis and Antiautophagy Mechanism. Oxid Med Cell Longev. 2021 Feb 4;2021:6610726. doi: 10.1155/2021/6610726. PMID: 33613823; PMCID: PMC7878070.

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7. Bioactivity

Biological target:

Furazolidone is a nitrofuran derivative with antiprotozoal and antibacterial activity that inhibits AML1-ETO transformed cells with IC50 value of 12.7 μM

In vitro activity

To assess the effects of FZD (furazolidone) on NF-κB signaling, luciferase assay was first conducted. As shown in Figure 1A,B, FZD significantly decreased NF-κB-driven luciferase activity in the basic level of SCLC cells. Additionally, FZD also significantly reduced TNFα-triggered luciferase activity in SCLC cells (Figure 1B). These data indicated that FZD could downregulate NF-κB signaling in SCLC cells. To further confirm above results, the activation level of NF-κB p65 was assessed. As shown in Figure 2A,B, FZD markedly downregulated the constitutive phosphorylation of NF-κB p65 dose-dependently in SCLC cells. And FZD also markedly downregulated TNFα-triggered phosphorylation of NF-κB p65 dose-dependently in SCLC cells (Figure 2C,D). FZD obviously induced the cleavages of PARP and Caspase3, the biomarkers of cell apoptosis, which suggested that FZD could induce SCLC cell apoptosis (Figure 4C). To further confirm it, FZD-treated SCLC cells were stained with PI and Annexin V, and flow cytometry was performed to assess the status of cell apoptosis. As shown in Figure 4D, the flow cytometry showed that FZD significantly upregulated the population of Annexin V-positive cells in both of H1417 and H1882 cells, which further suggested that FZD induced cell apoptosis in SCLC cells.

J Med Sci. 2020 Dec;36(12):998-1003. https://onlinelibrary.wiley.com/doi/10.1002/kjm2.12281

In vivo activity

To identify the dose of FZD on the survival time of irradiated mice, a postirradiation 15-day survival trial was conducted. Mice were also divided into 4 groups and treated with TBI+saline, TBI+60 mg/kg FZD, TBI+100 mg/kg FZD, and TBI+140 mg/kg FZD by intragastric administration. Mice were exposed to a lethal dose (8 Gy, for the survival time study only) of TBI. Irradiated mice treated with FZD exhibited a better physical situation than those without the treatment. FZD administration significantly improved the survival time of irradiated mice; moreover, higher FZD treatment showed better effect (Figure 1(c)). To investigate whether FZD protects mice from TBI-induced hematopoietic injury, the peripheral blood cell counts were measured at 15 d after 4 Gy TBI. Compared with saline-treated mice, the numbers of WBCs exhibited a clear increase in FZD-administrated mice (Figure 2(a)). To determine whether FZD treatment protected mice from IR-induced organ index changes, the spleen index and thymus index were measured, and FZD attenuated the decrease in the spleen index and thymus index following radiation treatment (Figures 2(b). Villi were observed in the intestines of mice pretreated with saline or FZD. Irradiation resulted in villus shortening and crypt dilating accompanied by epithelial atrophy or slough and even marked edema and inflammatory cell infiltration. FZD significantly recovered the damage (Figures 3(b) and 3(c)). In summary, FZD treatment can improve the survival of mice treated with lethal dose radiation by alleviating TBI-induced injury and inhibiting autophagy and apoptosis.

Oxid Med Cell Longev. 2021; 2021: 6610726. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7878070/