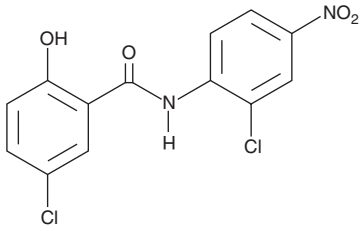
PRODUCT INFORMATION

Niclosamide

Item No. 10649

CAS Registry No.:	50-65-7
Formal Name:	5-chloro-N-(2-chloro-4-nitrophenyl)-2-hydroxy-benzamide
Synonym:	NSC 178296
MF:	$C_{13}H_8Cl_2N_2O_4$
FW:	327.1
Purity:	≥95%
UV/Vis.:	λ_{max}: 333 nm
Supplied as:	A crystalline solid
Storage:	-20°C
Stability:	≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Niclosamide is supplied as a crystalline solid. A stock solution may be made by dissolving the niclosamide in the solvent of choice, which should be purged with an inert gas. Niclosamide is soluble in the organic solvent ethanol at a concentration of approximately 0.5 mg/ml.

Description

Niclosamide is an anthelmintic that disrupts mitochondrial metabolism in parasitic worms and animal models.[1-3] It inhibits STAT3 transcriptional activity (IC_{50} = 0.25 µM in a reporter assay) and stimulates autophagy by reversibly inhibiting mammalian target of rapamycin complex 1 (mTORC1) signaling in MCF-7 cells expressing EGFP-LC3.[2,4] It completely inhibits phosphorylation of ribosomal S6 kinases (S6K) when used at a concentration of 3 µM.[2] Niclosamide (1 µM) induces mitochondrial uncoupling, decreasing cellular ATP concentrations and increasing the ratio of ADP to ATP in HepG2 cells, and activates AMP-activated protein kinase (AMPK) in NIH3T3 cells.[3] It also increases lipid oxidation by 5-fold in HepG2 cells. Niclosamide (5 and 10 µM) inhibits replication of severe acute respiratory coronavirus 2 (SARS-CoV-2) and Middle East respiratory syndrome CoV (MERS-CoV).[5] It prevents high-fat diet-induced hepatic steatosis and insulin resistance and improves glycemic control in *db/db* mice when administered at a dose of 125 mg/kg per day.[3] Niclosamide also inhibits proliferation and colony formation of DU145 prostate cancer cells, which have constitutively active STAT3 (IC_{50}s = 0.7 and 0.1 µM, respectively).[4]

References

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2. Balgi, A.D., Fonseca, B.D., Donohue, E., *et al.* Screen for chemical modulators of autophagy reveals novel therapeutic inhibitors of mTORC1 signaling. *PLoS One* **4(9)**, e7124 (2009).
3. Tao, H., Zhang, Y., Zeng, X., *et al*. Niclosamide ethanolamine-induced mild mitochondrial uncoupling improves diabetic symptoms in mice. *Nat. Med.* **20(11)**, 1263-1269 (2014).
4. Ren, X., Duan, L., He, Q., *et al*. Identification of niclosamide as a new small-molecule inhibitor of the STAT3 signaling pathway. *ACS Med. Chem. Lett*. **1(9),** 454-459 (2010).
5. Mostafa, A., Kandeil, A., Elshaier, Y.A.M.M., *et al*. FDA-approved drugs with potent in vitro antiviral activity against severe acute respiratory syndrome coronavirus 2. *Pharmaceuticals (Basel)* **13(12)**, 443 (2020).

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