Product Datasheet

ALG-055009

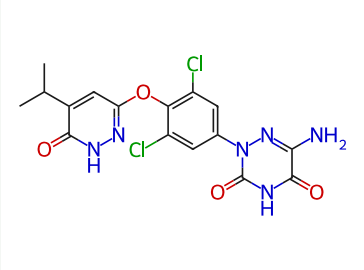
Catalog No. **BP-02271** · CAS **2542029-03-6** · Form **free base** · Physical state **solid** · Color **Off-white to light yellow** · Version **1.0** · Revision **2026-09-04**

FOR RESEARCH USE ONLY. NOT FOR HUMAN OR VETERINARY USE.

Target	Research area
Thyroid Hormone Receptor	**Metabolic Disease**

Molecular formula	$C_{16}H_{14}Cl_2N_6O_4$
Molecular weight	**425.2260**

STRUCTURE



DESCRIPTION

ALG-055009, a thyroid hormone receptor β (THR-β) agonist, exhibits an EC50 of 0.063 μM. It has been shown to reduce total cholesterol levels in rats fed a high-fat diet. ALG-055009 is used in the study of fatty liver diseases associated with metabolic dysfunction.

BIOLOGICAL ACTIVITY

In Vitro

ALG-055009 (Compound 14) (1 h) potently activates recombinant human THR-β with an EC50 of 0.063 μM and shows 5.7-fold selectivity for THR-β over recombinant human THR-α in a TR-FRET coactivator biochemical assay.

ALG-055009 (18-24 h) activates THR-β in transfected HEK293T cells with an EC50 of 0.050 μM and shows 3.8-fold selectivity for THR-β over THR-α in a luciferase reporter gene assay.

ALG-055009 (24 h) induces CPT1A gene expression in Huh-7 liver-derived cells with an EC50 of 9 nM, demonstrating potent on-target activity related to mitochondrial fatty acid β-oxidation.

ALG-055009 (1 μM; 0-180 min) shows high metabolic stability in cryopreserved mouse, rat, dog, cynomolgus monkey, and human hepatocytes.

ALG-055009 has low CYP450 inhibition potential in human liver microsomes, with an IC50 of 112 μM for CYP2C8, 37 μM for CYP2C9, and IC50 values >50 μM for CYP1A2, CYP2B6, CYP2C19, CYP2D6, and CYP3A4.

ALG-055009 (0.07-50 μM; 10 min) weakly inhibits recombinant human UGT1A1 with an IC50 of 37.5 μM, indicating low risk of glucuronidation-related drug-drug interactions.

ALG-055009 (5 μM; 1 h) shows good permeability across Caco-2 cell monolayers with an A to B Papp of 2.2 × 10-6 cm/s and a low efflux ratio of 6.

ALG-055009 (2 μM; 4 h) shows high plasma protein binding (>96%) in mouse, rat, dog, cynomolgus monkey, and human plasma.

ALG-055009 (5 μM; 60 min) has blood-to-plasma ratios of 0.49 to 0.64 in mouse, rat, dog, cynomolgus monkey, and human whole blood, showing no preferential red blood cell partitioning.

ALG-055009 is neither a substrate nor an
inhibitor (IC50 = 34.4 and 23.8 μM, respectively) of BCRP or OATP1B1.
ALG-055009 (up to 10 μM) shows no inhibition of human Nav1.5, Cav1.2, or hERG potassium channels at concentrations up to 10 μM, indicating low cardiovascular safety risk.
In Vivo
ALG-055009 (Compound 14) (0.015-1.5 mg/kg; p.o.; single dose) produces dose-dependent reductions in serum total cholesterol and LDL-C in high fat diet-fed hypercholesterolemic rats, with a minimum effective dose of 0.075 mg/kg, and induces significant increases in hepatic THR-β target gene expression at doses ≥0.15 mg/kg.

SOLUBILITY

Soluble in DMSO

REFERENCES

[1]. Vandyck K, et al. Discovery and Preclinical Profile of ALG-055009, a Potent and Selective Thyroid Hormone Receptor Beta (THR-β) Agonist for the Treatment of MASH. J Med Chem. 2024;67(17):14840-14851.