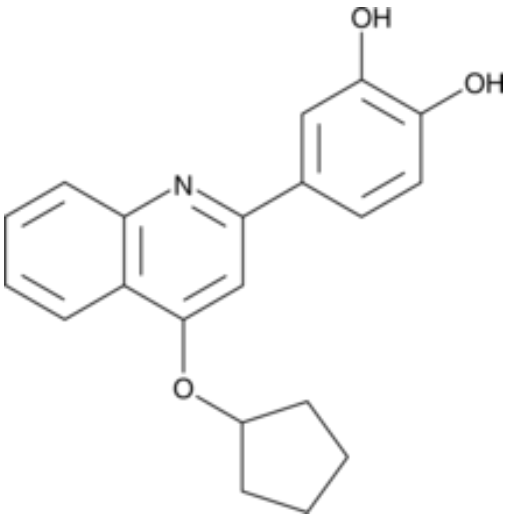
Product Data Sheet

Product Name: CMS121
Cat. No.: GC40632

Chemical Properties

Cas. No.	1353224-53-9		
Chemical Name	4-[4-(cyclopentyloxy)-2-quinolinyl]-1,2-benzenediol		
SMILES	OC1=CC(C2=NC(C=CC=C3)=C3C(OC4CCCC4)=C2)=CC=C1O		
Formula	$C_{20}H_{19}NO_3$	M.Wt	321.4
Solubility	20mg/mL in DMSO, 30mg/mL in DMF	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		

Structure



Protocol

Cell experiment [1]:

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Cell lines	SH-SY5Y cells
Preparation Method	To determine the cytotoxicity of CMS121, SH-SY5Y cells were seeded in a 96-well culture plate and exposed to increasing concentrations of either compounds or vehicle dimethyl sulfoxide (DMSO) the following day. After 48h of incubation, the number of viable cells was determined using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Similarly, shCTRL and shFASN cells were grown to confluence. The medium was then replaced with serum-free medium, and after 48 hours, the number of viable cells was measured using the MTT assay.
Reaction Conditions	5μM; 48h
Applications	CMS121 reduces the infectivity of HSV-1 viral particles.

Animal experiment [2]:

Animal models	Male db/db mice
Preparation Method	At 5 weeks of age, male db/db mice and untreated wild-type (WT) mice (C57BL/6J) were fed a standard rodent diet for 6 months with or without the addition of CMS121. Mice (12 per group) were randomly assigned to a treatment diet group (db/db + CMS121) or a control group (db/db). WT mice were also evaluated and used as a reference group to highlight the db/db phenotype. Food intake corresponded to an average consumption of 9.4mg/kg/day CMS121 during the first 17 weeks of treatment and an average consumption of 18.8mg/kg/day CMS121 during weeks 18-24.
Dosage form	9.4mg/kg, 18.8mg/kg; po; 24 weeks

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Applications	Long-term CMS121 treatment alleviates metabolic imbalance, liver inflammation, and reduces markers of kidney injury.

References:
[1]. Albano C, Trifiro L, Hewelt-Belka W, et al. The impact of fatty acid synthase on HSV-1 infection dynamics[J]. PLoS pathogens, 2025, 21(5): e1013068.
[2]. Zahid S, Dafre A L, Currais A, et al. The geroprotective drug candidate CMS121 alleviates diabetes, liver inflammation, and renal damage in db/db leptin receptor deficient mice[J]. International Journal of Molecular Sciences, 2023, 24(7): 6828.

Background

CMS121 is an orally active acetyl-CoA carboxylase 1 (ACC1) inhibitor [1]. CMS121 exerts potent neuroprotective, anti-inflammatory, antioxidant, and renal protective effects by elevating acetyl-CoA levels and activating AMPK [2-3]. CMS121 is primarily intended for the treatment of Alzheimer's-like neurodegenerative disorders [4].

In SH-SY5Y cells, CMS121 (5μM; 48h) reduces the infectivity of HSV-1 viral particles [5]. In hepatocytes, CMS12 (1μM; 24h) increases ac-STAT3 and p-STAT3 levels [6].

In male db/db mice, long-term CMS121 (9.4mg/kg, 18.8mg/kg; po; 24 weeks) treatment alleviates metabolic imbalance, liver inflammation, and reduces markers of kidney injury [7]. In SAMP8 mice model, treated with CMS121 (17mg/kg; po; 9 weeks) showed significantly reduced auditory brainstem responses threshold drift and increased preservation of inner hair cell ribbon synapses in the mid-frequency range [8].

References:
[1]. Dafre A L, Zahid S, Probst J J, et al. CMS121: a novel approach to mitigate aging-related obesity and metabolic dysfunction[J]. Aging (Albany NY), 2024, 16(6): 4980.
[2]. Dong J, Li M, Peng R, et al. ACACA reduces lipid accumulation through dual regulation of lipid metabolism and mitochondrial function via AMPK-PPARα-CPT1A axis[J]. Journal of Translational Medicine, 2024, 22(1): 196.

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[3]. Currais A, Huang L, Petrascheck M, et al. A chemical biology approach to identifying molecular pathways associated with aging[J]. GeroScience, 2021, 43(1): 353-365.
[4]. Currais A, Raschke W, Maher P. CMS121, a novel drug candidate for the treatment of Alzheimer's disease and age-related dementia[J]. Journal of Alzheimer's Disease, 2024, 101(s1): S179-S192.
[5]. Albano C, Trifirò L, Hewelt-Belka W, et al. The impact of fatty acid synthase on HSV-1 infection dynamics[J]. PLoS pathogens, 2025, 21(5): e1013068.
[6]. He Y, Wang S, Liu S, et al. MSL1 promotes liver regeneration by driving phase separation of STAT3 and histone h4 and enhancing their acetylation[J]. Advanced Science, 2023, 10(23): 2301094.
[7]. Zahid S, Dafre A L, Currais A, et al. The geroprotective drug candidate CMS121 alleviates diabetes, liver inflammation, and renal damage in db/db leptin receptor deficient mice[J]. International Journal of Molecular Sciences, 2023, 24(7): 6828.
[8]. Pham T B, Boussaty E C, Currais A, et al. Attenuation of age-related hearing impairment in senescence-accelerated mouse prone 8 (SAMP8) mice treated with fatty acid synthase inhibitor CMS121[J]. Journal of Molecular Neuroscience, 2023, 73(4): 307-315.

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