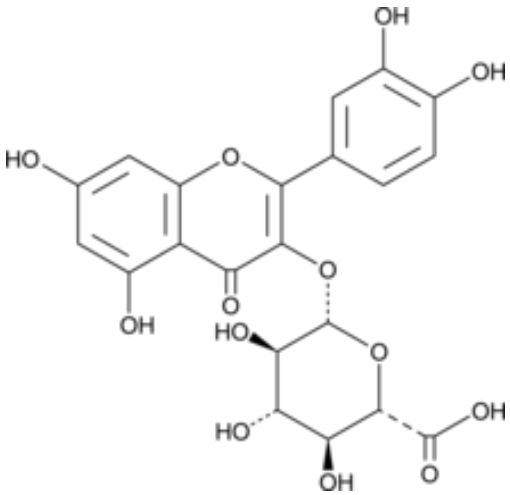
Product Data Sheet

Product Name: Miquelianin (Quercetin 3-O-glucuronide)
Cat. No.: GC44795

Chemical Properties

Cas. No.	22688-79-5		
SMILES	OC1=CC(O)=C(C(C(O[C@H]2[C@H](O)[C@@H](O)[C@H](O)[C@@H](C(O)=O)O2)=C(C3=CC=C(O)C(O)=C3)O4)=O)C4=C1		
Formula	C21H18O13	M.Wt	478.4
Solubility	DMF: 30 mg/ml,DMSO: 20 mg/ml,Ethanol: 10 mg/ml,PBS (pH 7.2): 2 mg/ml	Storage	Store at 2-8°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]:

Cell lines MDCK cells

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Preparation Method	MDCK cells were cultured in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% FBS, 100IU/mL penicillin, and 100μg/mL streptomycin at 37°C and 5% CO_2. When the cell density reached 70–80%, the supernatant was discarded, and different concentrations of the Miquelianin (6.25, 12.5, 25, 50, and 100μM) were plated in duplicate in five replicate wells. Virus-infected and uninfected cells were simultaneously treated with the working solution at different concentrations. Positive control wells (H1N1-UI182 virus only) and negative control wells (no H1N1-UI182 virus) were assigned to each plate. After 48 hours, cell viability was assessed using a CCK-8 assay.
Reaction Conditions	6.25-100μM; 48h
Applications	Miquiline can effectively inhibit the replication of H1N1-UI182 virus, as manifested by a significant decrease in the expression of viral nucleoprotein (NP) and a significant reduction in cytopathic effect (CPE) observed under a microscope.

Animal experiment [2]:

Animal models	Atopic dermatitis (AD) mice model
Preparation Method	To evaluate the anti-AD effects of oral Miquelianin treatment, the BALB/c mice were divided into five groups: naïve (TMA-non-exposed, n = 6), sham (untreated, n = 8), Miquelianin-4 (4mg/mL, n = 8), Miquelianin-10 (10mg/mL, n = 8), and Dex (1mg/mL, n = 6). Mice were sensitized on the shaved right flank with 50μL of 5% TMA in a mixed solvent (acetone/isopropyl myristate, 4:1 v/v) on day 0, and then 20μL of 2% TMA was applied to the surface of both ears on days 5, 8, 11, 14, 17, 20, 23, and 26. Miquelianin or Dex was administered orally daily from day 5 to 26.
Dosage form	4mg/mL, 10mg/mL; po; 21d

Caution: Product has not been fully validated for medical applications. For research use only.
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Applications	Oral administration of Miquelianin can significantly reduce serum IgE levels and the expression of Th2-related cytokines (such as IL-4 and IL-5) in the spleen, thereby inhibiting excessive Th2 immune responses.

References:
[1]. Li H, Shen B, Bi Y, et al. Miquelianin inhibits IAV infection via the MAPK signaling pathway both in vitro and in vivo[J]. Frontiers in Immunology, 2025, 16: 1532336.
[2]. Choi D W, Jung S Y, Kim G D, et al. Miquelianin inhibits allergic responses in mice by suppressing CD4+ T cell proliferation[J]. Antioxidants, 2021, 10(7): 1120.

Background

Miquelianin (Quercetin 3-O-glucuronide) is the main metabolite of quercetin in the body and is also a carbonyl reductase 1 (CBR1) inhibitor [1]. Miquelianin effectively scavenges reactive oxygen species (ROS), inhibits inflammatory responses mediated by the NF-κB signaling pathway, and improves cellular metabolic homeostasis by activating the PI3K/Akt pathway [2]. Miquelianin is primarily used in experimental studies of oxidative, anti-inflammatory, neuroprotective, and metabolic regulatory mechanisms [3-4].

In MDCK cells, Miquelianin can effectively inhibit the replication of H1N1-UI182 virus, as manifested by a significant decrease in the expression of viral nucleoprotein (NP) and a significant reduction in cytopathic effect (CPE) observed under a microscope [5]. In $C_3H_{10}T_{1/2}$ cells, Miquelianin (5μM, 10μM; 24h) can reduce intracellular lipid accumulation by promoting lipolysis and fatty acid β-oxidation and inhibiting lipid droplet formation, thereby exerting metabolic regulation and anti-fatty degeneration effects [6].

In atopic dermatitis (AD) mice model, Oral administration of Miquelianin (4mg/mL, 10mg/mL; po; 21d) can significantly reduce serum IgE levels and the expression of Th2-related cytokines (such as IL-4 and IL-5) in the spleen, thereby inhibiting excessive Th2 immune responses [7]. In HFD-fed mice model, Miquelianin (12.8mg/kg, 25.6mg/kg; ig; 12weeks) extract promotes white-to-beige fat conversion via blocking AMPK/DRP1/mitophagy and modulating gut microbiota [8].

References:

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[1]. Terao J, Yamaguchi S, Shirai M, et al. Protection by quercetin and quercetin 3-O-β-D-glucuronide of peroxynitrite-induced antioxidant consumption in human plasma low-density lipoprotein[J]. Free Radical Research, 2001, 35(6): 925-931.
[2]. Wang T, Lv L, Feng H, et al. Unlocking the potential: quercetin and its natural derivatives as promising therapeutics for sepsis[J]. Biomedicines, 2024, 12(2): 444.
[3]. Bakirhan N K, Sener S O, Baran M Y, et al. An Electrochemical Approach for a Flavonoid: Miquelianin via Carbon-Based Electrodes and Its Analysis from Calystegia silvatica[J]. Journal of AOAC International, 2025: qsaf032.
[4]. Schepetkin I A, Ramstead A G, Kirpotina L N, et al. Therapeutic potential of polyphenols from Epilobium angustifolium (Fireweed)[J]. Phytotherapy research, 2016, 30(8): 1287-1297.
[5]. Li H, Shen B, Bi Y, et al. Miquelianin inhibits IAV infection via the MAPK signaling pathway both in vitro and in vivo[J]. Frontiers in Immunology, 2025, 16: 1532336.
[6]. Wang Z, Xue C, Yang T, et al. Miquelianin, a main functional flavonoid of lotus leaf, induces thermogenic signature via p38-PINK1-PARKIN-mediated mitophagy and mimicking NRF2 signaling during brown adipocyte differentiation[J]. Food Frontiers, 2023, 4(4): 1831-1844.
[7]. Choi D W, Jung S Y, Kim G D, et al. Miquelianin inhibits allergic responses in mice by suppressing CD4+ T cell proliferation[J]. Antioxidants, 2021, 10(7): 1120.
[8]. Wang Z, Yang T, Zeng M, et al. Miquelianin in Folium Nelumbinis extract promotes white-to-beige fat conversion via blocking AMPK/DRP1/mitophagy and modulating gut microbiota in HFD-fed mice[J]. Food and Chemical Toxicology, 2023, 181: 114089.

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