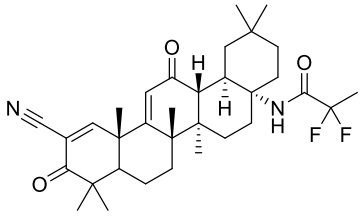
Product data sheet

MedKoo Cat#: 206147 Name: Omaveloxolone CAS#: 1474034-05-3 Chemical Formula: $C_{33}H_{44}F_2N_2O_3$ Exact Mass: 554.332 Molecular Weight: 554.71	
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:

Omaveloxolone, also known as RTA-408, is a member of the synthetic oleanane triterpenoid class of compounds and an activator of nuclear factor erythroid 2 [NF-E2]-related factor 2 (Nrf2, Nfe2l2), with potential chemopreventive activity. Upon administration, RTA 408 activates the cytoprotective transcription factor Nrf2. In turn, Nrf2 translocates to the nucleus, dimerizes with a small Maf protein (sMaf), and binds to the antioxidant response element (ARE). This induces the expression of a number of cytoprotective genes, including NAD(P)H quinone oxidoreductase 1 (NQO1), sulfiredoxin 1 (Srxn1), heme oxygenase-1 (HO1, HMOX1), superoxide dismutase 1 (SOD1), gamma-glutamylcysteine synthetase (gamma-GCS), thioredoxin reductase-1 (TXNRD1), glutathione S-transferase (GST), glutamate-cysteine ligase catalytic subunit (Gclc) and glutamate-cysteine ligase regulatory subunit (Gclm), and increases the synthesis of the antioxidant glutathione (GSH).

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	35.0	63.1

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.80 mL	9.01 mL	18.03 mL
5 mM	0.36 mL	1.80 mL	3.61 mL
10 mM	0.18 mL	0.90 mL	1.80 mL
50 mM	0.04 mL	0.18 mL	0.36 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. Sun X, Xie Z, Hu B, Zhang B, Ma Y, Pan X, Huang H, Wang J, Zhao X, Jie Z, Shi P, Chen Z. The Nrf2 activator RTA-408 attenuates osteoclastogenesis by inhibiting STING dependent NF-κb signaling. Redox Biol. 2020 Jan;28:101309. doi: 10.1016/j.redox.2019.101309. Epub 2019 Aug 27. PMID: 31487581; PMCID: PMC6728880.
2. Liu X, Ward K, Xavier C, Jann J, Clark AF, Pang IH, Wu H. The novel triterpenoid RTA 408 protects human retinal pigment epithelial cells against H2O2-induced cell injury via NF-E2-related factor 2 (Nrf2) activation. Redox Biol. 2016 Aug;8:98-109. doi: 10.1016/j.redox.2015.12.005. Epub 2015 Dec 19. PMID: 26773873; PMCID: PMC4731949.

In vivo study

1. Zhang L, Zhou Q, Zhou CL. RTA-408 protects against propofol-induced cognitive impairment in neonatal mice via the activation of Nrf2 and the inhibition of NF-κB p65 nuclear translocation. Brain Behav. 2021 Jan;11(1):e01918. doi: 10.1002/brb3.1918. Epub 2020 Dec 9. PMID: 33295701; PMCID: PMC7821557.

2. Tsai TH, Lin SH, Wu CH, Tsai YC, Yang SF, Lin CL. Mechanisms and therapeutic implications of RTA 408, an activator of Nrf2, in subarachnoid hemorrhage-induced delayed cerebral vasospasm and secondary brain injury. PLoS One. 2020 Oct 5;15(10):e0240122. doi: 10.1371/journal.pone.0240122. PMID: 33017422; PMCID: PMC7535038.

7. Bioactivity

Biological target:

Omaveloxolone (RTA 408) is an antioxidant inflammation modulator (AIM), which activates Nrf2 and suppresses nitric oxide (NO).

In vitro activity

RTA-408 activated Nrf2 expression during RANKL-induced osteoclastogenesis (Fig. 1A). To explore the effect of this compound on RANKL-induced osteoclast differentiation, this study treated BMMs with RANKL and M-CSF in the presence of RTA-408 at various concentrations (0, 5, 10, and 20 nM). RTA-408 significantly inhibited osteoclast differentiation in a dose-dependent manner as indicated by TRAP staining (Fig. 1C). TRAP-positive cells with more than three nuclei were considered osteoclasts. The number of osteoclasts decreased from approximately 233/well (no RTA-408) to 21/well (20 nM RTA-408). Further, osteoclasts with more than eight nuclei were scarcely observed upon treatment with 20 nM RTA-408 (Fig. 1D).

Reference: Redox Biol. 2020 Jan; 28: 101309. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6728880/

In vivo activity

RTA-408 pretreatment significantly reduced propofol-induced apoptosis of hippocampus neurons of mice ($p < .05$, Figure 6a,b). Besides, expression of Caspase-3 was tested in the CA1 area of hippocampus via immunohistochemistry, which showed Caspase-3 expression was increased significantly in other three groups compared with intralipid group, but when compared to vehicle + propofol group, its expression was decreased significantly in RTA-408 + propofol group (all $p < .05$, Figure 6c,d). Moreover, the activities of GPx, SOD, and CAT in the hippocampus of mice from propofol group and vehicle + propofol group were lower than those from intralipid group, while RTA-408 can significantly improve propofol-induced oxidative stress in hippocampus (all $p < .05$, Figure 6e–g).

Reference: Brain Behav. 2021 Jan; 11(1): e01918. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7821557/

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.