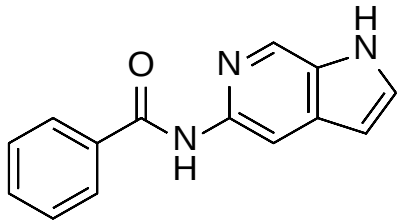
Product data sheet

MedKoo Cat#: 407175 Name: OAC1 CAS: 300586-90-7 Chemical Formula: $C_{14}H_{11}N_3O$ Exact Mass: 237.0902 Molecular Weight: 237.262	
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:
OAC1 is an Oct-4 activator, octamer-binding transcription factor 4 (Oct4)-activating compound, that enhances the iPSC reprogramming efficiency and accelerated the reprogramming process by 20-fold. OAC-1 also upregulates mRNA expression of Oct-4, Sox-2 and Nanog, as well as Tet1.

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
DMF	20.0	84.29
DMSO	32.33	136.28
DMSO:PBS (pH 7.2) (1:1)	0.5	2.11
Ethanol	11.75	49.52

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.21 mL	21.07 mL	42.15 mL
5 mM	0.84 mL	4.21 mL	8.43 mL
10 mM	0.42 mL	2.11 mL	4.21 mL
50 mM	0.08 mL	0.42 mL	0.84 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. Moradi-Hajidavaloo R, Jafarpour F, Hajian M, Rahimi Andani M, Rouhollahi Varnosfaderani S, Nasr-Esfahani MH. Oct-4 activating compound 1 (OAC1) could improve the quality of somatic cell nuclear transfer embryos in the bovine. Theriogenology. 2023 Mar 1;198:75-86. doi: 10.1016/j.theriogenology.2022.11.002. Epub 2022 Nov 4. PMID: 36565671.
2. Li W, Tian E, Chen ZX, Sun G, Ye P, Yang S, Lu D, Xie J, Ho TV, Tsark WM, Wang C, Horne DA, Riggs AD, Yip ML, Shi Y. Identification of Oct4-activating compounds that enhance reprogramming efficiency. Proc Natl Acad Sci U S A. 2012 Dec 18;109(51):20853-8. doi: 10.1073/pnas.1219181110. Epub 2012 Dec 3. PMID: 23213213; PMCID: PMC3529047.

In vivo study

1. Huang X, Lee MR, Cooper S, Hangoc G, Hong KS, Chung HM, Broxmeyer HE. Activation of OCT4 enhances ex vivo expansion of human cord blood hematopoietic stem and progenitor cells by regulating HOXB4 expression. Leukemia. 2016 Jan;30(1):144-53. doi: 10.1038/leu.2015.189. Epub 2015 Jul 23. PMID: 26202933; PMCID: PMC4703453.

Product data sheet

7. Bioactivity

Biological target:

OAC1 is a potent Oct4 activator.

In vitro activity

One of the compounds, termed Oct4-activating compound 1 (OAC1), was found to activate both Oct4 and Nanog promoter-driven luciferase reporter genes. Furthermore, when added to the reprogramming mixture along with the quartet reprogramming factors (Oct4, Sox2, c-Myc, and Klf4), OAC1 enhanced the iPSC reprogramming efficiency and accelerated the reprogramming process. OAC1 seems to enhance reprogramming efficiency in a unique manner, independent of either inhibition of the p53-p21 pathway or activation of the Wnt-β-catenin signaling. OAC1 increases transcription of the Oct4-Nanog-Sox2 triad and Tet1, a gene known to be involved in DNA demethylation.

Reference: Proc Natl Acad Sci U S A. 2012 Dec 18;109(51):20853-8. https://pubmed.ncbi.nlm.nih.gov/23213213/

In vivo activity

Since OCT4 expression has been associated with induction of pluripotency that could potentially lead to the formation of teratomas, $CD34^+$ cells from vehicle control cultures, OAC1 treatment cultures or human H9 ES cells were each injected subcutaneously into nude mice and were examined after 6 weeks. Teratomas, containing tissue from all three germ layers, formed from the H9 ES cells (Supplementary Figure 6) that were not observed in animals injected with $CD34^+$ cells from vehicle control cultures or OAC1 treatment cultures.

Reference: Leukemia. 2016 Jan;30(1):144-53. https://pubmed.ncbi.nlm.nih.gov/26202933/

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.