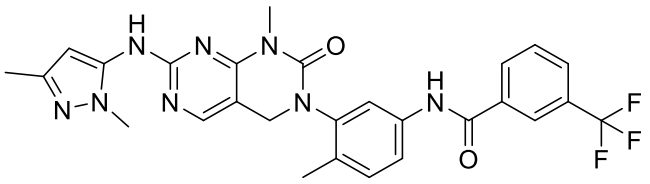
Product data sheet

MedKoo Cat#: 407160 Name: Pluripotin CAS#: 839707-37-8 Chemical Formula: $C_{27}H_{25}F_3N_8O_2$ Exact Mass: 550.20526 Molecular Weight: 550.55	
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:

Pluripotin, also known as SC-1, is a potent and selective activator of murine embryonic stem (ES) cell self-renewal. Pluripotin is a useful tool for studying cancer stem cell biology. Pluripotin enhances the expansion of rabbit limbal epithelial stem/progenitor cells in vitro. Pluripotin works through dual inhibition of RasGAP and ERK1. Pluripotin may not only facilitate practical applications of stem cells in research and therapy, but also provide previously undescribed insights into the complex biology of stem cells.

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	25.00	45.40

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.82 mL	9.08 mL	18.16 mL
5 mM	0.36 mL	1.82 mL	3.63 mL
10 mM	0.18 mL	0.91 mL	1.82 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. Mertins SD, Scudiero DA, Hollingshead MG, Divelbiss RD Jr, Alley MC, Monks A, Covell DG, Hite KM, Salomon DS, Niederhuber JE. A small molecule (pluripotin) as a tool for studying cancer stem cell biology: proof of concept. PLoS One. 2013;8(2):e57099. doi: 10.1371/journal.pone.0057099. Epub 2013 Feb 21. PMID: 23437320; PMCID: PMC3578829.
2. Wei Q, Liu H, Ai Z, Wu Y, Liu Y, Shi Z, Ren X, Guo Z. SC1 Promotes MiR124-3p Expression to Maintain the Self-Renewal of Mouse Embryonic Stem Cells by Inhibiting the MEK/ERK Pathway. Cell Physiol Biochem. 2017;44(5):2057-2072. doi: 10.1159/000485945. Epub 2017 Dec 12. PMID: 29241165.

In vivo study

1. Lin CJ, Amano T, Tang Y, Tian X. Improved derivation efficiency and pluripotency of stem cells from the refractory inbred C57BL/6 mouse strain by small molecules. PLoS One. 2014 Sep 11;9(9):e106916. doi: 10.1371/journal.pone.0106916. PMID: 25211343; PMCID: PMC4161378.

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7. Bioactivity

Biological target:

Pluripotin is a dual inhibitor of ERK1 and RasGAP with KDs of 98 nM and 212 nM, respectively as well as inhibiting RSK1, RSK2, RSK3, and RSK4 with IC50s of 0.5, 2.5, 3.3, and 10.0 μM, respectively

In vitro activity

Because enhanced clonogenic capacity in soft agar has been linked to CSC derived from patient CNS and prostate tumors, it was of interest to evaluate if SC-1 treated colon tumor lines were similarly affected. The 3 tumor lines with the largest SC-1 induced tumor formation (COLO 205, HCT-116, and HT29) had significant increases in cloning efficiencies (Figure 2A, n=3, paired Student's t test, p=0.001 (COLO 205, HCT-116) and p=0.01 (HT29)) as did HCC-2998 and KM12 tumor lines. It is notable that all tumor lines had increased cloning efficiency following SC-1 treatment if the assay was conducted using Matrigel instead of soft agar (data not shown). Thus, SC-1 is found to enhance colony formation in vitro. Additionally, a statistically significant increase in the number of cells expressing the CD133 glycosylated epitope was found for the HT29 tumor line following SC-1 treatment (Figure 2B, n=3, paired two tailed Student's t test, p=0.003, mean±s.e.m, control treated: 11.6±3.7% positive, SC-1 treated: 27.6±3.6% positive). In the SW-620 tumor line, the CD44 subpopulation was increased following treatment with SC-1 (Figure 2B, n=3, paired Student's t test, p=0.03, mean±s.e.m., control treated: 39.6±8.5% positive, SC-1 treated: 74.1±13.4% positive). No increased expression of the putative CSC markers was evident for the COLO 205 tumor line (a SC-1 sensitive tumor line). No changes in CD326 and CD166 surface expression were observed for any of the tumor lines. Thus, change in expression of certain CSC surface markers occurred following SC-1 treatment in colon tumor lines varied with the tumor line.

Reference: PLoS One. 2013; 8(2): e57099. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3578829/

In vivo activity

FES cells were selected from one of the C57BL/6 lines cultured in SC1-supplemented medium. These cells were alkaline phosphatase positive (Fig. 5D), expressed ES specific markers and are negative for the fibroblast marker fibrillin-2 (Fig. 5E–5G). The slight changes of colony morphology associated with SC1 were also noticed when we switched iPS cells from control ES medium to SC1-containing medium (Fig. 5C). We found that cells cultured in SC1-supplemented medium formed significantly more implantation sites in the 4N complementation tests (Table 2). In addition, more fES-4N, ntES-4N or iPS-4N full-term pups were generated from cells cultured in SC1-containing medium, although significant improvement was found only in the ntES cell group.SC1-supplementation is better for ES cell maintenance and in vivo developmental potentials. In summary, we demonstrated that all three types of pluripotent stem cells of the C57BL/6 background could generate full-term pups with high efficiency when cultured with SC1 (Table 2).

Reference: PLoS One. 2014; 9(9): e106916. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4161378/