

Product Data Sheet v190714

Product Name **MEISi-2, MEIS inhibitor-2**

Synonyms MEISi-2, MEISi-EX, small molecule inhibitor-2 of MEIS proteins, small molecule inhibitor of MEIS homeodomain, small molecule inhibitor of MEIS1, small molecule inhibitor of MEIS2, small molecule inhibitor of MEIS3

Biological description

Studies in the last decade have shown that MEIS proteins have crucial roles in regeneration, stem cell/progenitor function, cellular metabolism, RLS and tumorigenesis. Various cancers overexpress MEIS proteins and its cofactors (Reviewed in Current Drug Targets). MEIS proteins have been found to interact with PBX1 and HOXA9 while driving tumorigenesis.

We have used our proprietary tools and expertise in MEIS biology to develop MEIS inhibitors. We have performed in silico, in vitro, ex vivo and in vivo assays to validate small molecule MEIS inhibitors. Newly developed small molecule MEIS inhibitors are cell-permeant and dose dependent.

Product Information

MEIS inhibitor-2;

- A cell-permeable, a small molecule that specifically inhibits **MEIS Homeodomain (HD)-target DNA** interaction, thereby preventing the transactivation of MEIS targeted gene expression [1-14].
- **In silico:** Has a high affinity and preferential binding to MEIS HD in comparison to other TALE family of homeodomain proteins[5-14].
- **In vitro:** Inhibits MEIS-Luc activity in a dose dependent manner as low as 100 nM [5-14].
- **In vitro:** May downregulate the expression of Meis1, and MEIS target genes including Hif-1 α , and Hif-2 α . Note that Meis1 is known to transcriptionally regulate expression of Hif-1 α and Hif-2 α [3, 5-14].
- **In vitro:** May induce apoptosis in cancer cells (T47D, human breast cancer cells, in-house analysis, not published)
- **In vitro:** Shown to inhibit tumor cell growth (Effective concentration: 25 μ M using T47D human breast cancer cells, in-house analysis, not published,).
- **In vitro:** MEISi-2 (MEISi-Ex) is cytotoxic to cancer cells lines with an average IC50 values of 17.7 for T47D breast

cancer cells (This data has not been published, it is an in-house analysis).

- **In vivo:** Downregulates the expression of Meis1 and Hif-2 α in the bone marrow[9-14].
- **In vivo:** Induces mouse hematopoietic stem cell expansion[9-14].
- **Ex vivo:** Induces human umbilical cord blood hematopoietic stem cell expansion[9-14].

Product Target Proteins / Genes	Meis1, Meis2, and Meis3. Homeodomain of human MEIS1 (isoform 1) and human MEIS2 (Isoform-1 aka Meis2C) aminoacid sequences are %100 identical. Homeodomain of human MEIS3 (isoform 1) only differ by one aminoacid from homeodomains of human MEIS1 and MEIS2.
Form	Yellow solid
Molecular weight	306.32
Chemical formula	C18H14N2O3
Solubility Overview	Soluble in DMSO
Inert gas (Yes/No)	Packaged under inert gas
CAS number	N/A
Purity	≥95% by HPLC
Solubility	DMSO (100 mg/ml)
Source	Synthetic



Research areas Biochemicals, Pharmacology, Signalig, Transcription Factors

Storage Store at +2°C to +8°C

Store under desiccating conditions.

The product can be stored for up to 12 months.

Protect from light.

Do Not Freeze Ok to freeze

Special Instructions Wherever possible, you should prepare and use solutions on the same day. However, if you need to make up stock solutions in advance, we recommend that you store the solution as aliquots in tightly sealed vials at -20°C. Stock solutions are stable for up to 3 months at -20°C. Before use, and prior to opening the vial we recommend that you allow your product to equilibrate to room temperature for at least 1 hour.

Product Profile & Procedures In order to obtain best results and activity in different techniques and preparations we recommend determining optimal working concentration by dilutions. Here are some recommendation to start with:

A. Procedure for in vitro treatments
Reconstitute MEIS inhibitors in DMSO. See our [product page](#) for how to prepare stock solutions. Following reconstitution, aliquot and freeze (-20°C). To adjust MEIS inhibitor concentration to in vitro assays, make dilutions in DMSO (or PBS depending on the application). We recommend diluting MEIS inhibitors in DMSO when performing serial dilutions and optimum dose determination for a particular cell type or application. A 100X working stock (1mM) could be prepared and 1 µl of working stock may be added to 100 µL of cell culture medium to achieve 10 µM final MEIS inhibitor dose in vitro. Use DMSO in control treatments and add same amount of DMSO to control wells. User should adjust cell number and the duration of treatment for each assay. In order to obtain best results and activity in different

techniques and preparations we recommend determining optimal working concentration.

B. Procedure for in vivo treatments in mice

For an initial animal testing in the healthy wild type mice, 1-10 mM of MEISi-1 (or MEISi-2 inhibitors) may be diluted with DPBS to a final concentration of 1-10 μ M. 100 μ l of MEISi-1 (or MEISi-2, and 1% DMSO only) may be intraperitoneally injected into 6-8 week-old wild type mice for three times for three days apart. In order to obtain best results and activity in different techniques and preparations we recommend determining optimal working concentration.

Precautions

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices. Through your purchase, you expressly represent and warrant to MEINOX that you will properly test and use any Products purchased from MEINOX in accordance with industry standards. MEINOX and its authorized distributors reserve the right to refuse to process any order where we reasonably believe that the intended use will fall outside of our acceptable guidelines. Please visit our Terms & Conditions page for more information.

Disclaimer

While every effort were made to ensure the accuracy of the information provided in this datasheet, MEINOX will not be liable for any omissions or errors contained herein. MEINOX reserves the right to make changes to this datasheet at any time without prior notice. It is the responsibility of the customer to report product performance issues to MEINOX within 30 days of receipt of the product.

Other Notes

Small amounts of MEIS inhibitor vial(s) may occasionally become entrapped in the seal of the product vial during shipment and storage. If necessary, briefly centrifuge the vial on a tabletop centrifuge to dislodge any powder in the container`s cap.

Note that this data sheet is not lot-specific and is representative of the current specifications for this product. Please consult the certificate of analysis for further information. Note that shipping conditions may differ from storage conditions.

Bibliography & References

1. Arbatli, S., G.S. Aslan, and F. Kocabas, *Stem Cells in Regenerative Cardiology*. Adv Exp Med Biol, 2018. 1079: p. 37-53.

2. Yucel, D. and F. Kocabas, *Developments in Hematopoietic Stem Cell Expansion and Gene Editing Technologies*. Adv Exp Med Biol, 2018. 1079: p. 103-125.
3. Aksoz, M., et al., *Emerging Roles of Meis1 in Cardiac Regeneration, Stem Cells and Cancer*. Curr Drug Targets, 2018. 19(2): p. 181-190.
4. Turan, R.D., et al., *Evolving approaches to heart regeneration by therapeutic stimulation of resident cardiomyocyte cell cycle*. Anatol J Cardiol, 2016. 16(11): p. 881-886.
5. Kocabas, F., et al., *Hypoxic metabolism in human hematopoietic stem cells*. Cell Biosci, 2015. 5: p. 39.
6. Mahmoud, A.I., et al., *Meis1 regulates postnatal cardiomyocyte cell cycle arrest*. Nature, 2013. 497(7448): p. 249-253.
7. Kocabas, F., et al., *Meis1 regulates the metabolic phenotype and oxidant defense of hematopoietic stem cells*. Blood, 2012. 120(25): p. 4963-72.
8. Simsek, T., et al., *The distinct metabolic profile of hematopoietic stem cells reflects their location in a hypoxic niche*. Cell Stem Cell, 2010. 7(3): p. 380-90.
9. Arbatlı, S., M. Uslu, and F. Kocabaş, *Identification of Cardiogenic and Hematopoietic MEIS Inhibitors that Enhance Cellular Proliferation and HDR Gene Expression*. 5th International Bau Drug Design Congress. Istanbul, Turkey, 19-21 October, 2017.
10. Eren, Ş.N., R.D. Turan, and F. Kocabaş, *Hücre ekspansiyonunda etkin MEIS inhibitörlerinin geliştirilmesi*. Hücre İmmunoterapi sempozyumu, 20-22 October 2017.
11. Kocabas, F., *MEIS proteinlerini inhibe eden bir kombinasyon*. ÜSİMP Ulusal Patent Fuarı 2017. Istanbul, Turkey, 6-7 November 2017. .
12. Kocabaş, F., et al., *Identification of Hematopoietic and Cardiogenic MEIS Inhibitors that Enhance Cellular Proliferation and HDR Gene Expression*. 5th International Congress of the Molecular Biology Association of Turkey (MolBiyKon'17). Istanbul, Turkey, 8-10 September 2017.
13. Kocabas, F. and R.D. Turan, *MEIS PROTEİNLERİNİ İNHİBE EDEN BİR KOMBİNASYON*. Patent 2016/16602 . Turkey.
14. Turan, R.D., E.K. Ergin, and F. Kocabas, *The Establishment of Homeobox Family Inhibitor Library and Meis1 Reporter Assays*. 3rd International BAU Drug Design Congress. Istanbul, Turkey, Oct 1-3. 2015.