

# Product data sheet



MedKoo Cat#: 406525 Name: STA-21 CAS#: 111540-00-2 Chemical Formula: C <sub>19</sub> H <sub>26</sub> N <sub>2</sub> O <sub>5</sub> S <sub>2</sub> Exact Mass: 426.1283 Molecular Weight: 426.55	
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:

STA-21 is a promising STAT-3 inhibitor that reciprocally regulates Th17 and Treg cells, inhibits osteoclastogenesis in mice and humans and alleviates autoimmune inflammation in an experimental model of rheumatoid arthritis. STA-21 improved the clinical course of arthritis in IL-1Ra-KO mice. It increased not only the number of Treg cells but also the function of the Treg cells. It also suppressed Th17 cells and osteoclast formation. These data suggest that STA-21 might be an effective treatment for patients with RA.

## 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	16.67	54.42

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.26 mL	16.32 mL	32.65 mL
5 mM	0.65 mL	3.26 mL	6.53 mL
10 mM	0.33 mL	1.63 mL	3.26 mL
50 mM	0.07 mL	0.33 mL	0.65 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

- Mohammad TAM, Hamad BK, Maroof AMA, Mahmud SO. STA-21 regulates Th-17/Treg balance and synovial fibroblasts functions in rheumatoid arthritis. *Int J Rheum Dis.* 2024 Jan;27(1):e15032. doi: 10.1111/1756-185X.15032. PMID: 38287543.
- Wang L, Zhao J, Ren JP, Wu XY, Morrison ZD, Elgazzar MA, Ning SB, Moorman JP, Yao ZQ. Expansion of myeloid-derived suppressor cells promotes differentiation of regulatory T cells in HIV-1+ individuals. *AIDS.* 2016 Jun 19;30(10):1521-1531. doi: 10.1097/QAD.0000000000001083. PMID: 26959508; PMCID: PMC4889474.

### In vivo study

- Gharibi T, Barpour N, Hosseini A, Mohammadzadeh A, Marofi F, Ebrahimi-Kalan A, Nejati-Koshki K, Abdollahpour-Alitappeh M, Safaei S, Baghbani E, Baradaran B. STA-21, a small molecule STAT3 inhibitor, ameliorates experimental autoimmune encephalomyelitis by altering Th-17/Treg balance. *Int Immunopharmacol.* 2023 Jun;119:110160. doi: 10.1016/j.intimp.2023.110160. Epub 2023 Apr 18. Erratum in: *Int Immunopharmacol.* 2023 May 11;110303. PMID: 37080068.
- Nadeem A, Al-Harbi NO, Ansari MA, Al-Harbi MM, El-Sherbeeney AM, Zoheir KMA, Attia SM, Hafez MM, Al-Shabanah OA, Ahmad SF. Psoriatic inflammation enhances allergic airway inflammation through IL-23/STAT3 signaling in a murine model. *Biochem Pharmacol.* 2017 Jan 15;124:69-82. doi: 10.1016/j.bcp.2016.10.012. Epub 2016 Oct 28. PMID: 27984001.

# Product data sheet



## 7. Bioactivity

### Biological target:

---

STA-21 is a natural antibiotic and a STAT3 inhibitor. STA-21 can inhibit STAT3 DNA binding activity and STAT3 dimerization.

### In vitro activity.

---

STA-21 has potential in the treatment of rheumatoid arthritis (RA). STA-21 reduced the proportion of Th-17 cells and the expression of STAT3 target genes, ROR $\gamma$ t, IL-21, and IL-23R involved in Th-17 cells differentiation while. Conversely, STA-21 conversely increased the proportion of Treg cells. STA-21 could reduce the expression of STAT3 target genes related to cell proliferation, apoptosis, and inflammation leading to a decrease in proliferation and conversely increase in apoptosis of RA-synovial fibroblasts.

Reference: Int J Rheum Dis. 2024 Jan;27(1):e15032. <https://pubmed.ncbi.nlm.nih.gov/38287543/>

### In vivo activity

---

STA-21 has potential as a treatment strategy for the treatment of experimental autoimmune encephalomyelitis (EAE). In a mouse model, STA-21 ameliorated the EAE severity and decreased the EAE inflammation and demyelination. It also decreased STAT3 phosphorylation, the proportion of Th17 cells and the protein level of IL-17. STA-21 significantly decreased the expression of Th17 related transcription factors, ROR $\gamma$ t and IL-23R while FOXP3 expression associated with Treg differentiation was increased.

Reference: Int Immunopharmacol. 2023 Jun;119:110160. <https://pubmed.ncbi.nlm.nih.gov/37080068/>

*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.*