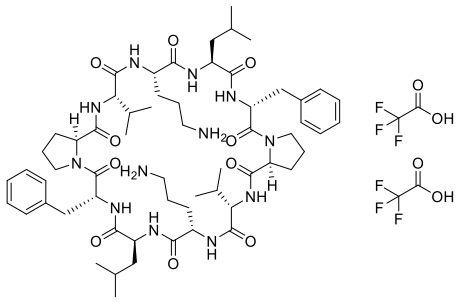
Product data sheet

MedKoo Cat#: 333082 Name: Gramicidin S TFA CAS#: 113-73-5 (free base) Chemical Formula: $C_{64}H_{94}F_6N_{12}O_{14}$ Molecular Weight: 1369.52	
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:

Gramicidin S (GS), also known as Gramicidin soviet, is an antibiotic. GS reduces the cell number of planktonic cells within 20-40 min at a concentration of 40-80 μg/mL. GS kills the cells of pre-grown biofilms at concentrations of 100-200 μg/mL, such that no re-growth is possible. The translocation of the peptide into the cell interior and its complexation with intracellular nucleotides, including the alarmon ppGpp, can explain its anti-biofilm effect. The successful treatment of persistently infected root canals of two volunteers confirms the high effectiveness of GS. The broad GS activity towards resistant, biofilm-forming E. faecalis suggests its applications for approval in root canal medication.

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
To be determined	To be determined	To be determined

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	0.73	3.65	7.30
5 mM	0.15	0.73	1.46
10 mM	0.07	0.37	0.73
50 mM	0.01	0.07	0.15

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. Berditsch M, Afonin S, Reuster J, Lux H, Schkolin K, Babii O, Radchenko DS, Abdullah I, William N, Middel V, Strähle U, Nelson A, Valko K, Ulrich AS. Supreme activity of gramicidin S against resistant, persistent and biofilm cells of staphylococci and enterococci. Sci Rep. 2019 Nov 29;9(1):17938. doi: 10.1038/s41598-019-54212-z. PMID: 31784584; PMCID: PMC6884456.
2. Mogi T, Kita K. Gramicidin S and polymyxins: the revival of cationic cyclic peptide antibiotics. Cell Mol Life Sci. 2009 Dec;66(23):3821-6. doi: 10.1007/s00018-009-0129-9. Epub 2009 Aug 23. PMID: 19701717.

In vivo study

1. Chen D, Qin W, Wen G, Shi B, Liu Z, Wang Y, Zhou Q, Quan J, Zhou B, Bu X. Dissociation of haemolytic and oligomer-preventing activities of gramicidin S derivatives targeting the amyloid-β N-terminus. Chem Commun (Camb). 2017 Dec 14;53(100):13340-13343. doi: 10.1039/c7cc08180d. PMID: 29188836.
2. Okamoto K, Tomita Y, Yonezawa H, Hirohata T, Ogura R, Izumiya N. Inhibitory effect of gramicidin S on the growth of murine tumor cells in vitro and in vivo. Oncology. 1984;41(1):43-8. doi: 10.1159/000225789. PMID: 6199707.

7. Bioactivity

Product data sheet

Biological target:

GS is active against Gram-negative and Gram-positive bacteria by perturbing integrity of the bacterial membranes. GS inhibits cytochrome bd quinol oxidase.

In vitro activity

GS outperformed temporin L (TL) and innate-defense regulator IDR-1018 (IDR) against clinical strains of Staphylococcus aureus, Enterococcus faecalis, and Enterococcus faecium, displaying superior potency and effectiveness in killing cells. GS demonstrated the lowest minimal biofilm inhibiting concentrations, particularly against strains with substantial biofilm biomass, and exhibited robust bactericidal, antipersister, and antibiofilm activities.

Reference: Sci Rep. 2019 Nov 29;9(1):17938. https://pubmed.ncbi.nlm.nih.gov/31784584/

In vivo activity

GS has potential in anticancer treatments. A daily intraperitoneal injection of GS exhibited a high inhibitory effect on the growth of subcutaneously implanted allotransplantable sarcoma 180 in ICR mice, and on the growth of subcutaneously implanted syngeneic Meth A in BALB/c mice.

Reference: Oncology. 1984;41(1):43-8. https://pubmed.ncbi.nlm.nih.gov/6199707/

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.