



## Gentamicin Sulfate, USP - PRODUCT DATA SHEET

Version 2.0

Revision Date: 12/01/2010

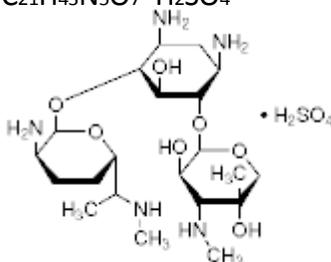
**Product Name:** Gentamicin Sulfate, USP

**Product Number:** G006

**CAS Number:** 1405-41-0

**Chemical Formula:**  $C_{21}H_{43}N_5O_7 \cdot H_2SO_4$

**Structure:**



**Molecular Weight:** 575.6

**Appearance:** White powder

**Description:** Gentamicin is an aminoglycoside antibiotic that is synthesized by *Micromonospora*. It is active against most gram-negative bacteria and some gram-positive. It interrupts protein synthesis by binding the 30S subunit of the bacterial ribosome.

**Storage Temperature:** 2-8°C

**Mechanism of Action:** Aminoglycosides like gentamicin "irreversibly" bind to specific 30S-subunit proteins and 16S rRNA. Specifically gentamicin binds to four nucleotides of 16S rRNA and a single amino acid of protein S12. This interferes with decoding site in the vicinity of nucleotide 1400 in 16S rRNA of 30S subunit. This region interacts with the wobble base in the anticodon of tRNA. This leads to interference with the initiation complex, misreading of mRNA so incorrect amino acids are inserted into the polypeptide leading to nonfunctional or toxic peptides and the breakup of polysomes into nonfunctional monosomes.

### Antimicrobial Potency for Gentamicin:

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Organism	MIC50 (µg/ml)	MIC90 (µg/ml)	Range (µg/ml)
<i>Acinetobacter</i> spp.		>16	
<i>Aeromonas salmonicida</i>			<0.5-?
<i>Bacillus cereus</i> (ATCC 14579)			1-?
<i>Bacillus subtilis</i>			0.1-?
<i>Bacillus subtilis</i> (03)			0.5-?
<i>Bacillus subtilis</i> (ATCC 6633)			10-?
<i>Bacillus subtilis</i> (susceptible)			?-0.8
<i>Bacillus thuringiensis</i> (ATCC 33679)			2-?
<i>Bacteroides fragilis</i> (NCTC 9343)			128-?
<i>Burkholderia cepacia</i> (ATCC 25416)			16-?
<i>Citrobacter freundii</i>		4	
<i>Citrobacter koseri</i>		0.5	
<i>Corynebacterium</i> spp.	8	>16	1->16
<i>Eikenella corrodens</i>	≤4 ≤4 ≤4->4		
<i>Enterobacter</i>			<0.25-2
<i>Enterobacter aerogenes</i>		2	
<i>Enterobacter aerogenes</i>	0.5	1	0.25-2
<i>Enterobacter cloacae</i>		2	
<i>Enterobacter cloacae</i>	0.5	4	0.25->16
<i>Enterobacter cloacae</i> (ATCC 23355 + β-lactams-resistant)			<0.5-?
Enterobacteriaceae			0.03-128
Enterococci			6-750
Enterococci			0.5-2048
Enterococci (vancomycin-resistant)	>1000	>1000 ≤500->1000	
Enterococci (vancomycin-susceptible)	≤500	>1000 ≤500->1000	
<i>Enterococci faecium</i> (7303 + vancomycin-resistant)			8-?
<i>Enterococci faecium</i> (95-42 + vancomycin-resistant)			16-?
<i>Enterococcus</i>			8-32
<i>Enterococcus faecalis</i>	16	16	16->128
<i>Enterococcus faecalis</i>	>2048	>2048	2->2048
<i>Enterococcus faecalis</i> (10706 + aminoside-resistant)			?-25
<i>Enterococcus faecalis</i> (1104 + aminoside-resistant)			?-25
<i>Enterococcus faecalis</i> (1194 + aminoside-resistant)			?-12.5
<i>Enterococcus faecalis</i> (16/9 + aminoside-resistant)			?-25
<i>Enterococcus faecalis</i> (166aminoside-resistant)			?-25
<i>Enterococcus faecalis</i> (2503 + aminoside-resistant)			?->50
<i>Enterococcus faecalis</i> (4673 + aminoside-resistant)			?-25
<i>Enterococcus faecalis</i> (4922 + susceptible)			?-50
<i>Enterococcus faecalis</i> (ATCC 29212 + aerobic)			16-?
<i>Enterococcus faecalis</i> (ATCC 29212 + anaerobic)			8-?
<i>Enterococcus faecalis</i> (ATCC 29212)			?-12.5

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Organism	MIC50 (µg/ml)	MIC90 (µg/ml)	Range (µg/ml)
<i>Enterococcus faecalis</i> (ATCC 29212)			8-?
<i>Enterococcus faecalis</i> (ATCC 29212)			8-?
<i>Enterococcus faecalis</i> (ATCC 51299)			>64-?
<i>Enterococcus faecalis</i> (BM4275 + vancomycinB-resistant)			16-?
<i>Enterococcus faecalis</i> (BM4316 + vancomycinA-resistant)			16-?
<i>Enterococcus faecalis</i> (high-level aminoglycoside resistance)	>1000	>1000	≤500->1000
<i>Enterococcus faecalis</i> (JH2-2)			16-?
<i>Enterococcus faecalis</i> (Madou + aminoglycoside-resistant)			?->50
<i>Enterococcus faecium</i>	>128	>128	16->128
<i>Enterococcus faecium</i>	32	>2048	8->2048
<i>Enterococcus faecium</i> (high-level aminoglycoside resistance) ≤500		>1000	≤500->1000
<i>Enterococcus faecium</i> (vancomycin-resistant)	>2048	>2048	4->2048
<i>Enterococcus gallinarum</i>			4-16
<i>Enterococcus</i> spp.			
<i>Enterococcus</i> spp. (high-level aminoglycoside resistance)	>1000	>1000	≤500->1000
<i>Enterococcus</i> spp. (vancomycin-resistant)		1000	>1000
<i>Enterococcus</i> spp. (vancomycin-susceptible)		≤500	>1000
<i>Escherichia coli</i>			<0.25-1
<i>Escherichia coli</i>		2	
<i>Escherichia coli</i>			64-?
<i>Escherichia coli</i>			1-?
<i>Escherichia coli</i>	0.5	2	0.25->16
<i>Escherichia coli</i> (12)			0.25-?
<i>Escherichia coli</i> (26)			>256-?
<i>Escherichia coli</i> (animal health isolates)			<0.25-32
<i>Escherichia coli</i> (ATCC 10536)			20-?
<i>Escherichia coli</i> (ATCC 25922 + aerobic)			1-?
<i>Escherichia coli</i> (ATCC 25922 + anaerobic)			16-?
<i>Escherichia coli</i> (ATCC 25922)			<0.5-?
<i>Escherichia coli</i> (ATCC 25922)			0.78-?
<i>Escherichia coli</i> (ATCC 25922)			0.5-?
<i>Escherichia coli</i> (MG1655)			<0.5-?
<i>Escherichia coli</i> (NCTC 10418)			0.5-?
<i>Escherichia coli</i> (NCTC 10418)			0.25-?
<i>Haemophilus influenzae</i> (ATCC 49247)			2-?
<i>Haemophilus</i> spp.			0.12-16
<i>Klebsiella</i>			<0.25-32
<i>Klebsiella oxytoca</i>		2	
<i>Klebsiella oxytoca</i> (ATCC 51983 + β-lactams-resistant)			4-?
<i>Klebsiella pneumoniae</i>		16	
<i>Klebsiella pneumoniae</i>			0.39-?

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<i>Klebsiella pneumoniae</i>	4	>16	0.25->16
<i>Morganella morganii</i>		4	
<i>Mycobacterium chelonae</i> (ATCC 19977)			20-?
<i>Mycobacterium smegmatis</i> (ATCC 607)			40-?
<i>Neisseria</i> spp.			0.5-16
<i>Pantoea agglomerans</i>		2	
<i>Proteus mirabilis</i>		4	
<i>Proteus mirabilis</i> (33)			256-?
<i>Pseudomonas aeruginosa</i>			<0.25->64
<i>Pseudomonas aeruginosa</i>		8	
<i>Pseudomonas aeruginosa</i>			0.5-?
<i>Pseudomonas aeruginosa</i>			0.78-?
<i>Pseudomonas aeruginosa</i>	2	16	1->16
<i>Pseudomonas aeruginosa</i>			2.5-?
<i>Pseudomonas aeruginosa</i> (10662)			2-?
<i>Pseudomonas aeruginosa</i> (ATCC 15443)			20-?
<i>Pseudomonas aeruginosa</i> (ATCC 25619)			<0.5-?
<i>Pseudomonas aeruginosa</i> (ATCC 27853)			<0.5-?
<i>Pseudomonas aeruginosa</i> (ATCC 27853)			1-?
<i>Pseudomonas aeruginosa</i> (ATCC 39324)			<0.5-?
<i>Pseudomonas aeruginosa</i> (ATCC 51674)			<0.5-?
<i>Pseudomonas aeruginosa</i> (BAA-47)			<0.5-?
<i>Pseudomonas aeruginosa</i> (genetamicin-susceptible)			<0.25-4
<i>Pseudomonas aeruginosa</i> (K799)			16-?
<i>Pseudomonas aeruginosa</i> (NCTC 10662)			1-?
<i>Pseudomonas aeruginosa</i> (Z61)			<0.5-?
<i>Pseudomonas</i> spp.			0.00-128
Salmonella			<0.25-2
<i>Salmonella enterica</i> (Typhimurium + 14028s)			<0.5-?
<i>Salmonella enterica</i> (Typhimurium + MS7953s)			<0.5-?
<i>Salmonella</i> spp.		16	
<i>Salmonella typhi</i>			4-?
<i>Salmonella typhi</i>			1-?
<i>Serratia</i>			<0.25-1
<i>Serratia marcescens</i>		8	
Staphylococci			0.008-128
Staphylococci (coagulase negative + methicillin-resistant) 32 128			0.03-64
Staphylococci (coagulase negative + methicillin-susceptible) 0.125 4			0.03-128
Staphylococci (coagulase-negative + methicillin-resistant) 8 >16			≤0.06->16
Staphylococci (coagulase-negative + methicillin-resistant) ≤0.12 32			≤0.12-64
Staphylococci (coagulase-negative + methicillin-susceptible) ≤0.06 ≤0.06			≤0.06->16

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Organism	MIC50 (µg/ml)	MIC90 (µg/ml)	Range (µg/ml)
Staphylococci (coagulase-negative + methicillin-susceptible)	≤0.12	≤0.12	≤0.12-0.25
Staphylococci (coagulase-negative + oxacillin-resistant)	≤2	>8	≤2->8
Staphylococci (coagulase-negative + oxacillin-susceptible)	≤2	≤2	≤2-?
Staphylococci (coagulase-negative)	16	>16	≤0.12->16
Staphylococcus			<0.25-0.5
<i>Staphylococcus aureus</i>	1	>16	≤0.12->16
<i>Staphylococcus aureus</i>			1-?
<i>Staphylococcus aureus</i>	1	>16	0.25->16
<i>Staphylococcus aureus</i>			1-?
<i>Staphylococcus aureus</i>	12.5	50	0.1->200
<i>Staphylococcus aureus</i>			0.78-?
<i>Staphylococcus aureus</i>			64-?
<i>Staphylococcus aureus</i> (08)			0.5-?
<i>Staphylococcus aureus</i> (10389)			0.25-?
<i>Staphylococcus aureus</i> (10391)			0.25-?
<i>Staphylococcus aureus</i> (10397)			>4-?
<i>Staphylococcus aureus</i> (10413)			0.25-?
<i>Staphylococcus aureus</i> (10467)			0.25-?
<i>Staphylococcus aureus</i> (10774)			0.12-?
<i>Staphylococcus aureus</i> (1167 + methicillin-resistant)			?-50
<i>Staphylococcus aureus</i> (14379 + glycopeptide-intermediately-resistant)			64-?
<i>Staphylococcus aureus</i> (16)			0.5-?
<i>Staphylococcus aureus</i> (17232 + methicillin-resistant)			?-50
<i>Staphylococcus aureus</i> (18)			1-?
<i>Staphylococcus aureus</i> (18417 + methicillin-resistant)			?-0.8
<i>Staphylococcus aureus</i> (25)			1-?
<i>Staphylococcus aureus</i> (27)			0.5-?
<i>Staphylococcus aureus</i> (3037 + methicillin-resistant)			?-25
<i>Staphylococcus aureus</i> (420 + lincosamide-resistant + macrolide-resistant + streptogramin-β-resistant)			?->50
<i>Staphylococcus aureus</i> (4698 + methicillin-resistant)			?->50
<i>Staphylococcus aureus</i> (4699 + methicillin-resistant)			?->50
<i>Staphylococcus aureus</i> (494 + methicillin-resistant)			0.125-?
<i>Staphylococcus aureus</i> (4942 + methicillin-resistant)			?-25
<i>Staphylococcus aureus</i> (542 + methicillin-resistant)			?-0.4
<i>Staphylococcus aureus</i> (802)			?-1.6
<i>Staphylococcus aureus</i> (8249)			0.12-?
<i>Staphylococcus aureus</i> (8251)			0.12-?
<i>Staphylococcus aureus</i> (8258)			2-?
<i>Staphylococcus aureus</i> (992 + glycopeptide-intermediately-resistant)			0.5-?

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Organism	MIC50 (µg/ml)	MIC90 (µg/ml)	Range (µg/ml)
<i>Staphylococcus aureus</i> (ATCC 25923)			0.12-?
<i>Staphylococcus aureus</i> (ATCC 25923)			<0.5-?
<i>Staphylococcus aureus</i> (ATCC 25923)			0.25-?
<i>Staphylococcus aureus</i> (ATCC 29213 + aerobic)			0.5-?
<i>Staphylococcus aureus</i> (ATCC 29213 + anaerobic)			8-?
<i>Staphylococcus aureus</i> (ATCC 29213)			?-0.2
<i>Staphylococcus aureus</i> (ATCC 29213)			0.12-?
<i>Staphylococcus aureus</i> (ATCC 29213)			0.25-?
<i>Staphylococcus aureus</i> (ATCC 6538)			5-?
<i>Staphylococcus aureus</i> (ATCC 6571)			0.12-?
<i>Staphylococcus aureus</i> (BAA-38 + methicillin-resistant)			<0.5-?
<i>Staphylococcus aureus</i> (BAA-40 + methicillin-resistant)			>64-?
<i>Staphylococcus aureus</i> (BAA-44 + methicillin-resistant)			>64-?
<i>Staphylococcus aureus</i> (ciprofloxacin-resistant + methicillin-susceptible)	64	>256	0.25->256
<i>Staphylococcus aureus</i> (ciprofloxacin-resistant + methicillin-susceptible)	64	256	≤0.06->256
<i>Staphylococcus aureus</i> (ciprofloxacin-susceptible + methicillin-resistant)	64	256	0.12->256
<i>Staphylococcus aureus</i> (ciprofloxacin-susceptible + methicillin-susceptible)	0.5	64	≤0.06-128
<i>Staphylococcus aureus</i> (methicillin-resistant)			0.5-?
<i>Staphylococcus aureus</i> (methicillin-resistant)	64	128	0.25->128
<i>Staphylococcus aureus</i> (methicillin-resistant)	0.5	>16	0.12->16
<i>Staphylococcus aureus</i> (methicillin-resistant)	1	128	0.125->128
<i>Staphylococcus aureus</i> (methicillin-resistant)	>128	>128	0.5->128
<i>Staphylococcus aureus</i> (methicillin-susceptible)			0.5-?
<i>Staphylococcus aureus</i> (methicillin-susceptible)	0.5	1	0.25-1
<i>Staphylococcus aureus</i> (methicillin-susceptible)	0.25	1	≤0.06->16
<i>Staphylococcus aureus</i> (methicillin-susceptible)	1	2	0.125-64
<i>Staphylococcus aureus</i> (methicillin-susceptible)	0.5	128	0.12->128
<i>Staphylococcus aureus</i> (ML 123)			1-?
<i>Staphylococcus aureus</i> (Mu50 + glycopeptide-intermediately-resistant)			128-?
<i>Staphylococcus aureus</i> (NCTC 6571)			0.25-?
<i>Staphylococcus aureus</i> (oxacillin-resistant)	>8	>8 ≤2->8	
<i>Staphylococcus aureus</i> (oxacillin-susceptible)	≤2	≤2 ≤2->8	
<i>Staphylococcus aureus</i> (SA31593)			0.12-?
<i>Staphylococcus aureus</i> (Trazié + methicillin-resistant)			?->50
<i>Staphylococcus auricularis</i>	6.25	50	0.05-200
<i>Staphylococcus capitis</i>	6.25	50	0.05-200
<i>Staphylococcus epidermidis</i>	0.25	>32	≤0.015->32
<i>Staphylococcus epidermidis</i>	16	>16	≤0.12->16

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<i>Staphylococcus epidermidis</i>			1-?
<i>Staphylococcus epidermidis</i>	0.125	4	0.06-4
<i>Staphylococcus epidermidis</i>	0.39	25	0.05-200
<i>Staphylococcus epidermidis</i> (C621)			16-?
<i>Staphylococcus epidermidis</i> (culture medium: Biofilm)	4	>32 ≤0.015-32	
<i>Staphylococcus haemolyticus</i>	8	>16 ≤0.12->16	
<i>Staphylococcus haemolyticus</i>	6.25	50	0.05-200
<i>Staphylococcus hominis</i>	6.25	50	0.05-200
<i>Staphylococcus saprophyticus</i> (31)			0.5-?
<i>Staphylococcus</i> spp. (coagulase-negative + methicillin-resistant)	64	>128 ≤0.06->128	
<i>Staphylococcus</i> spp. (coagulase-negative + methicillin-susceptible)	0.25	32 ≤0.06->128	
<i>Staphylococcus warneri</i>	6.25	50	0.05-200
<i>Streptococcus</i> (15876)			?->50
<i>Streptococcus</i> (3476)			?-50
<i>Streptococcus</i> (group A)			?-6.25
<i>Streptococcus</i> (β-hemolytic)			?-0.8
<i>Streptococcus agalactiae</i>	16	16	16-32
<i>Streptococcus faecalis</i>	12.5	25	6.25-25
<i>Streptococcus faecalis</i> (32)			0.5-?
<i>Streptococcus pneumoniae</i>	12.5	25	0.05-25
<i>Streptococcus pneumoniae</i> (penicillin-intermediate)	16	32	8-32
<i>Streptococcus pneumoniae</i> (penicillin-resistant)	16	32	16-32
<i>Streptococcus pneumoniae</i> (penicillin-susceptible)	16	16	16-32
<i>Streptococcus pyogenes</i>	8	16	2-16
<i>Streptococcus viridans</i>	12.5	25	0.05-25
<i>Streptococcus β-haemolyticus</i>	12.5	25	0.05-25
<i>Streptomyces thermonitrificans</i>			1-?
<i>Vibrio anguillarum</i>			1-?