



G418 Disulfate PRODUCT DATA SHEET

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Product Name:	G418 Disulfate
Product Number:	G001
CAS Number:	108321-42-2
Molecular Formula:	$C_{20}H_{40}N_4O_{10} \cdot 2H_2SO_4$
Molecular Weight:	692.71
Form:	Powder
Appearance:	White or off-white powder
Solubility:	Water: 100mg/mL (clear and complete)
Source:	<i>Micromonospora rhodorangea</i>
Biological Assay:	ED ₅₀ Resistant: ≥2500 ug/mL ED ₅₀ Sensitive: ≤400 ug/mL
Elemental Analysis:	Carbon: 28.80-36.07% Hydrogen: 5.76-7.76% Nitrogen: 6.72-8.41% Water of Hydration: 0-6
Ammonia:	≤1.0%
Water Content (Karl Fischer):	≤12.0%
Potency (on a dry basis):	≥720 µg/mg (≥700 µg/mg As is)
Absorbance:	1mg/mL:280nm <0.015 100mg/mL: 570nm <0.10
pH:	4.6-6.0 (200mg/mL)
Optical Rotation:	+104° to +121°
Storage Conditions:	Ambient

Description:

G418 disulfate, also known as G418 sulfate, is routinely used as a selection antibiotic in cell culture gene selection applications. G418 disulfate is an aminoglycoside antibiotic isolated from *Micromonospora rhodorangea* and is closely related to the gentamicins; most notably, gentamicin B1.

TOKU-E also offers:

- [G418 Disulfate Solution \(G021\)](#)
- [G418 Disulfate, EvoPure \(G030\)](#) (≥99.0% pure)
- [G418 Disulfate, \(Low Endotoxin\) \(G048\)](#)

Suasnavas et al. used G418 disulfate from TOKU-E to select for resistant porcine TE and FF cells. Read more here: "[Characterization and Potential Utility of Porcine Trophoblast-Derived Stem-Like Cells.](#)"

Wang, et al. used G418 disulfate from TOKU-E in RPMI media to select RFP expressing TC-2 cells. Read more here: "[3D Porous Chitosan–Alginate Scaffolds as an In Vitro Model for Evaluating Nanoparticle-Mediated Tumor Targeting and Gene Delivery to Prostate Cancer.](#)"

Baradaran-Heravi et al. used G418 disulfate from TOKU-E to study premature termination codon readthrough in H1299 cells. Read more here: "[Novel small molecules potentiate premature termination codon readthrough by aminoglycosides.](#)"

Mechanism of Action:

G418 disulfate, and other aminoglycosides, including [kanamycin](#) and [neomycin](#), prevent protein synthesis by blocking the elongation step in prokaryotic and eukaryotic ribosomes.

Mechanism of resistance:

Resistance to G418 sulfate is conferred by the *neo* gene (neomycin resistant gene) from either Tn5 or Tn601 (903) transposons. Cells successfully transfected with resistance plasmids containing the *neo* resistance gene can express aminoglycoside 3'-phosphotransferase (APT 3' I or APT 3' II) which covalently modifies G418 to 3-phosphoric G418. 3-phosphoric G418 has negligible potency and has low-affinity for prokaryotic or eukaryotic ribosomes.

Spectrum:

G418 disulfate is toxic to susceptible prokaryotic and eukaryotic cells including fungi (yeasts and molds), bacteria, mammalian and plant cells.

Microbiology Applications

G418 Disulfate can be used as a selection agent for G418 resistant bacteria or fungi after transformation.

References:

Aragão F.J.L. and Brasileiro A.C.M., Positive, negative and marker-free strategies for transgenic plant selection. *Braz. J. Plant Physiol.*, 14(1):1-10, 2002

Davis, Bernard D. "Mechanism of Bactericidal Action of Aminoglycosides." *Microbiological Reviews* 51.3 (1987): 341-50.

Lin-Cereghino, Joan, et. al.. "Direct Selection of *Pichia pastoris* Expression Strains Using New G418 Resistance Vectors." *Yeast* 25 (2008): 293-99. *Interscience.wiley.com*. Web. 25 Apr. 2013.

Shin, Young-Mi. "Selection of NptII Transgenic Sweetpotato Plants Using G418 and Paromomycin." *Journal of Plant Biology* 50.2 (2007): 206-12. *Researchgate.net*. Web. 25 Apr. 2013.

