

# G418

Selection antibiotic; cell culture tested  
Catalog code: ant-gn-1, ant-gn-2, ant-gn-5  
<http://www.invivogen.com/g418>

For research use only  
Version 19K29-MM

## PRODUCT INFORMATION

### Contents:

G418 is supplied as a sterile filtered solution at 100 mg/ml in HEPES buffer. This product is available in 3 pack sizes:

- ant-gn-1: 10 x 1 ml (1 g)
- ant-gn-2: 20 x 1 ml (2 g)
- ant-gn-5: 1 x 50 ml (5 g)

### Storage and stability:

- G418 is shipped at room temperature. Upon receipt it should be stored at 4°C. It may be stored at -20°C. Avoid repeated freeze-thaw cycles.
- The expiry date is specified on the product label.

## QUALITY CONTROL

Each lot is thoroughly tested to ensure the absence of lot-to-lot variation.

- Purity: ≥ 90% (HPLC)
- Endotoxin level: < 0.5 EU/mg
- Physicochemical characterization (pH, appearance)
- Cell culture tested: potency validated in G418-sensitive and G418-resistant mammalian cell lines
- Non-cytotoxicity of trace contaminants: absence of long-term effects confirmed in G418-resistant cells

## DESCRIPTION

G418, also known as G418 sulfate and Geneticin, is used for the selection and maintenance of eukaryotic cells expressing the *neo* gene<sup>1</sup>. It is an aminoglycoside antibiotic similar in structure to gentamycin B1. G418 is produced by *Micromonospora rhodorangea*. This antibiotic blocks polypeptide synthesis and protein elongation in eukaryotic cells by binding 70S and 80S ribosomes<sup>2</sup>.

Resistance to G418 is conferred by the bacterial gene for aminoglycoside-3'-phosphotransferase (APH 3' II3) that can be expressed in eukaryotic cells.

## SAFETY CONSIDERATIONS

G418 is a harmful compound. Refer to safety data sheet for handling instructions.

## GENERAL GUIDELINES

Successful transfection is influenced by many factors. The health and viability of the cell line, the quality of the nucleic acid used, the transfection reagent, the duration of transfection, and the presence or absence of serum can all play a part.

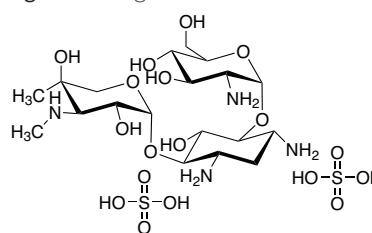
## CHEMICAL PROPERTIES

CAS number: 108321-42-2

Formula: C<sub>20</sub>H<sub>40</sub>N<sub>4</sub>O<sub>10</sub> • 2H<sub>2</sub>SO<sub>4</sub>

Molecular weight: 692.7 g/mol

Structure:



## SELECTION CONDITIONS

### Mammalian cells

The working concentration of G418 Sulfate for selection and maintenance of mammalian cell lines transfected with the *neo* gene varies with a multitude of factors including cell type. In a starting experiment we recommend to determine optimal concentrations of antibiotic required to kill your host cell line by treating the cells with several concentrations, ranging from 100 µg/ml to 1 mg/ml. After treatment, cell death occurs rapidly, allowing the selection of transfected cells with plasmids carrying the *neo* gene in as little as 7 days post-transfection.

## WORKING CONCENTRATIONS

G418 is normally used at a concentration of 400 µg/ml. However, the optimal concentration needs to be determined for your cells. Suggested concentrations of G418 for selection in some examples of mammalian cells are listed below (with references on the next page).

Cell line	Medium	G418 conc.	Ref.
B16 (Mouse melanocytes)	RPMI	400-1000 µg/ml	3, 4
CHO (Chinese hamster ovarian cells)	Ham's	400-800 µg/ml	5, 6
HeLa (Human uterine cells)	DMEM	200-400 µg/ml	7, 8
HEK293 (Human embryonic kidney cells)	DMEM	200-500 µg/ml	9, 10
THP-1 (Human monocytes)	RPMI	250 µg/ml	11, 12

## TECHNICAL SUPPORT

InvivoGen USA (Toll-Free): 888-457-5873

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## References (articles featuring G418)

1. **Davies J & Jimenez A., 1980.** A new selective agent for eukaryotic cloning vectors. *A.m J Trop Med Hyg* 29(5 Suppl):1089-92. 2. **Bar-Nun S. et al. 1983.** G-418, an elongation inhibitor of 80 S ribosomes. *Biochim Biophys Acta.* 741(1):123-7. 3. **Arikawa K. et al., 2003.** Ligand-dependent inhibition of B16 melanoma cell migration and invasion via endogenous S1P2 G protein-coupled receptor. Requirement of inhibition of cellular RAC activity. *J Biol Chem.* 278(35):32841-51. 4. **DiLillo DJ. et al., 2010.** B cells are required for optimal CD4+ and CD8+ T cell tumor immunity: therapeutic B cell depletion enhances B16 melanoma growth in mice. *J Immunol.* 2010 Apr 1;184(7):4006-16. 5. **Brust T. et al., 2015.** Bias Analyses of Preclinical and Clinical D2 Dopamine Ligands: Studies with Immediate and Complex Signaling Pathways. *J. Pharmacol. Exp. Ther.,* Jan 352: 480-93. 6. **Figueroa K. et al., 2009.** Selectivity of agonists for the active state of M1 to M4 muscarinic receptor subtypes. *J Pharmacol Exp Ther.* 28(1):331-42. 7. **Kwon JA. et al., 2005.** Biological function of the vaccinia virus Z-DNA-binding protein E3L: gene transactivation and anti-apoptotic activity in HeLa cells. 8. **Hermoso M. et al., 2004.** Cell volume regulation in response to hypotonicity is impaired in HeLa cells expressing a protein kinase Calpha mutant lacking kinase activity. *J Biol Chem.* 279(17):17681-9. 9. **Hennen S. et al., 2013.** Decoding signaling and function of the orphan G protein-coupled receptor GPR17 with a small-molecule agonist. *Sci. Signal.,* 6(298):ra93. 10. **Chen Q. et al., 2003.** Expression of *Drosophila* trehalose-phosphate synthase in HEK-293 cells increases hypoxia tolerance. *J Biol Chem.* 2003 Dec 5;278(49):49113-8. 11. **Tukhvatulin A. et al., 2013.** Combined stimulation of Toll-like receptor 5 and NOD1 strongly potentiates activity of NF- $\kappa$ B, resulting in enhanced innate immune reactions and resistance to *Salmonella enterica* serovar Typhimurium infection. *Infect Immun.* 81(10):3855-64. 12. **Maue AC. et al., 2013.** The polysaccharide capsule of *Campylobacter jejuni* modulates the host immune response. *Infect Immun.* 81(3):665-72.

## RELATED PRODUCTS

Product	Description	Catalog Code
<b>Other selection antibiotics</b>		
Blasticidin	Selection antibiotic for the <i>bsr</i> or BSD genes	ant-bl-1
Puromycin	Selection antibiotic for the <i>pac</i> gene	ant-pr-1
Hygromycin B Gold	Selection antibiotic for the <i>hph</i> gene	ant-hg-1
Zeocin™	Selection antibiotic for the <i>Sh ble</i> gene	ant-zn-1
<b>Plasmids encoding the <i>neo</i> gene</b>		
pMOD2-Neo	Plasmid encoding a synthetic neomycin resistance gene	pmod2-neo
pMONO-neo-GFP	GFP-expression plasmid with neomycin resistance gene	pmonon-gfp
pMONO-neo-mcs	Expression plasmid with neomycin resistance gene	pmonon-mcs
pSELECT-neo-LacZ	LacZ-expression plasmid selectable with neomycin	psetn-lacz
pSELECT-neo-mcs	Expression plasmid selectable with neomycin	psetn-mcs

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