Primocin®

For the prevention of microbial contamination in primary cell cultures

Catalog code: ant-pm-05, ant-pm-1, ant-pm-2

https://www.invivogen.com/primocin

For research use only. Not for human or veterinary use.

Version 23E17-MM

PRODUCT INFORMATION

Contents

Primocin® is supplied as a cell culture tested, sterile filtered, light yellow solution at 50 mg/ml. It is available in 3 pack sizes:

- **ant-pm-05:** 5 x 1 ml (250 mg)
- **ant-pm-1:** 10 x 1 ml (500 mg)
- **ant-pm-2:** 1 x 20 ml (1 g)

The 1 ml vial is sufficient to treat 500 ml of culture.
The 20 ml bottle is sufficient to treat 10 liters of culture.

Shipping and storage

- Primocin® is shipped at room temperature. Upon receipt, it can be stored at 4 °C for 6 months or at -20 °C for long-term storage. Avoid repeated freeze-thaw cycles.
- The expiry date is specified on the product label.

Note: Product is stable for 1 month at room temperature.

QUALITY CONTROL

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

- Endotoxin level: < 0.5 EU/mg
- Physicochemical characterization (pH, appearance)
- Cell culture tested: potency validated on bacterial and fungal reference strains

DESCRIPTION

Primocin® is a broad-spectrum antibiotic formulation specifically designed to protect primary cells from microbial contaminations. Primary cells are valuable models for scientific experimentation; however, they are highly susceptible to contamination either from the natural flora of the host animal or during the cell isolation procedure. Primocin® provides complete protection against microbial contaminants. It is active against Gram-positive (e.g. *Bacillus* and *Staphylococcus* species) and Gram-negative bacteria (e.g. *E. coli*, *Enterobacter*, *P. aeruginosa* and *Acinetobacter*), mycoplasmas, and fungi including yeasts (e.g. *C. albicans* and *S. cerevisiae*). There is no need to add penicillin and streptomycin (Pen-Strep).

Primocin® provides maximum protection against microbial contamination with minimal cytotoxicity as it acts on targets found only in microorganisms. Primocin® is composed of four compounds, of which three act on mycoplasmas, Gram-positive and Gram-negative bacteria. These compounds target DNA gyrase and the prokaryotic ribosomal subunits (30S and 50S), and hence block DNA and protein synthesis, respectively. The fourth compound eradicates fungi, including yeasts. The fungal target is ergosterol, a molecule only found in the cell membrane of fungi.

METHODS

Preventive use against contamination by bacteria, mycoplasmas, and fungi (including yeasts)

We recommend using Primocin® at 100 µg/ml, which represents a 1:500 dilution of stock solution (see table below).

Recommended volumes for Primocin®

Reagent	T25 with 5 ml medium	T75 with 15 ml medium	500 ml bottle
Primocin®	10 µl	30 µl	1 ml

1. Split an actively dividing culture of cells into medium containing 100 µg/ml of Primocin®.
2. Remove and replace with fresh Primocin®-containing medium every 3-4 days.
3. Repeat every time the culture medium requires refreshment.

APPLICATIONS

Primocin® has been used successfully for the protection of numerous murine and human primary cell cultures, including fibroblasts[1], glial cells[2], astrocytes[3], peripheral blood mononuclear cells (PBMCs)[4], and natural killer (NK) cells[5]. Notably, Primocin® has been defined as a "critical addition" used throughout the culturing and reprogramming of embryonic cells[6], and pluripotent stem cells[4]. Several published protocols specify the use of Primocin® for 3D cellular models such as organoids and spheroids. It is included routinely in the growth of colon epithelial and carcinoma organoids[7] as well as bladder[8], breast[9,10], and prostate[11] cancer organoids. Of note, Primocin® can be added to the wash and storage buffers when obtaining primary cells from biopsies[12].

Examples from the literature of Primocin® use

Cells cultures[Citation]	Primocin® conc
Human bladder[8], breast[9, 10], colon epithelia[7], colorectal cancer[13], intestinal[14], liver[15], & pancreatic[16] organoids	100 µg/ml
Human pluripotent stem cells[4] & mesenchymal[17] precursor cells	100 µg/ml
PBMCs[4] & human NK cells[5]	100 µg/ml
Murine embryonic fibroblasts[18-20], pluripotent stem cells[20], embryonic mammary progenitor cells[21] & astrocytes[3]	100 µg/ml
Cultures of human colon normal and tumour fibroblasts[1]	250 µg/ml
Human pluripotent stem cells[18]	100-500 µg/ml
Neonatal rat ventricular myocytes[22]	500 µg/ml

Note: Full citations are listed on the next page.

CITATIONS

Below are the citations of various applications for the use of Primocin® as listed on the previous page.

1. Ferrer-Mayorga, G. *et al.*, 2019. Vitamin D and Wnt3A have additive and partially overlapping modulatory effects on gene expression and phenotype in human colon fibroblasts. Sci Rep 9:8085. **2. Bussian T.J. *et al.*, 2018.** Clearance of senescent glial cells prevents tau-dependent pathology and cognitive decline. Nature. 562:578-82. **3. Grabner, G.F. *et al.*, 2016.** Deletion of Monoglyceride Lipase in Astrocytes Attenuates Lipopolysaccharide-induced Neuroinflammation. J Biol Chem 291;913-23. **4. Park S. *et al.*, 2018.** Generation of human induced pluripotent stem cells using a defined, feeder-free reprogramming system. Curr Protoc Stem Cell Biol 45. **5. Garcia-Beltran, W.F. *et al.*, 2016.** Open conformers of HLA-F are high-affinity ligands of the activating NK-cell receptor KIR3DS1. Nat Immunol 17:1067-74. **6. Kogata N. *et al.*, 2018.** Sox9 regulates cell state and activity of embryonic mouse mammary progenitor cells. Commun Biol. 1:228. **7. Urbischek M. *et al.*, 2019.** Organoid culture media formulated with growth factors of defined cellular activity. Sci Rep 9:6193. **8. Lee S.H. *et al.*, 2018.** Tumor evolution and drug response in patient-derived organoid models of bladder cancer. Cell 173:515-28. **9. Sachs N. *et al.*, 2018.** A living biobank of breast cancer organoids captures disease heterogeneity. Cell. 172:373-86. **10. Lee S.H. *et al.*, 2018.** Tumor evolution and drug response in patient-derived organoid models of bladder cancer. Cell. 173:515-528. **11. Xu H. *et al.*, 2018.** Organoid technology and applications in cancer research. J Hematol Oncol 11:116. **12. Glenn V.L. *et al.*, 2012.** Isolation of human dermal fibroblasts from biopsies. p131. In: Human Stem Cell Manual: A Laboratory Guide. Edited by: Peterson S. &,Loring J.F. **13. Roper J. *et al.*, 2018.** Colonoscopy-based colorectal cancer modeling in mice with CRISPR-Cas9 genome editing and organoid transplantation. Nat Protoc. 13:217-34. **14. Christensen S. *et al.*, 2019.** 5-Fluorouracil treatment induces characteristic T>G mutations in human cancer. Nat Commun. 10:4571. **15. Jager M. *et al.*, 2018.** Measuring mutation accumulation in single human adult stem cells by whole-genome sequencing of organoid cultures. Nat Protoc. 13:59-78. **16. Tsai S. *et al.*, 2018.** Development of primary human pancreatic cancer organoids, matched stromal and immune cells and 3D tumor microenvironment models. BMC Cancer. 18:335. **17. Sondermeijer HP *et al.*, 2018.** RGDfK-peptide modified alginate scaffold for cell transplantation and cardiac neovascularization. Tissue Eng Part A. 24:740-51. **18. Wang J. *et al.*, 2016.** Isolation and cultivation of naive-like human pluripotent stem cells based on HERVH expression. Nat Protoc. 11:327-46. **19. Lionnet T. *et al.*, 2011.** A transgenic mouse for in vivo detection of endogenous labeled mRNA. Nat Methods. 8:165-70. **20. Grabundzija I. *et al.*, 2013.** Sleeping Beauty transposon-based system for cellular reprogramming and targeted gene insertion in induced pluripotent stem cells. Nucleic Acids Res. 41:1829-47. **21. Kogata N. *et al.*, 2018.** Sox9 regulates cell state and activity of embryonic mouse mammary progenitor cells. Commun Biol. 1:228. **22. Shekhar A. *et al.*, 2018.** ETV1 activates a rapid conduction transcriptional program in rodent and human cardiomyocytes. Sci Rep. 8:9944.

RELATED PRODUCTS

Product	Description	Cat. Code
Fungin™	Antifungal agent	ant-fn-1
Normocin™	Antimicrobial agent	ant-nr-1
Normocure™	Antibacterial agent	ant-noc
Plasmocin® Prophylactic	Anti-mycoplasma agent	ant-mpp
Plasmocin® Treatment	Mycoplasma removal agent	ant-mpt
PlasmoTest™	Mycoplasma detection kit	rep-pt1