



Hygromycin B PRODUCT DATA SHEET

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Product Name:	Hygromycin B
Product Number:	H007
CAS Number:	31282-04-9
Molecular Formula:	C ₂₀ H ₃₇ N ₃ O ₁₃
Molecular Weight:	527.52
Form:	Powder
Appearance:	Off-White or Light Tan Powder
Solubility:	Water: Freely Soluble
Source:	<i>Streptomyces Hygroscopicus.</i>
Water Content (Karl Fischer):	≤15.0%
Potency (on a dry basis):	≥900 u/mg
Melting Point:	160-180°C
Storage Conditions:	2-8°C

Description: Hygromycin B is a unique aminoglycoside antibiotic derived from *Streptomyces hygroscopicus*. Hygromycin B is routinely used as a selective agent in cell culture or microbiology applications to isolate hygromycin B resistant cells. TOKU-E recommends preparing a stock solution at 50 mg/mL - 100 mg/mL. TOKU-E also offers [hygromycin B solution](#) conveniently prepared at 50 mg/mL in PBS buffer.

This product is considered a dangerous good. Quantities above 1 g may be subject to additional shipping fees. Please [contact us](#) for specific questions.

For more Hygromycin B products, [click here](#).

Mechanism of Action: Hygromycin B inhibits protein synthesis by strengthening the interaction of tRNA binding in the ribosomal A-site. Hygromycin B also prevents mRNA and tRNA translocation by an unknown mechanism. These are unique mechanisms for an aminoglycoside antibiotic and they differ from the mode of action neomycin, gentamicin, and G418.

Mechanism of resistance:

Hygromycin B resistance is conferred by the hph gene and is isolated from *Streptomyces hygroscopicus* DNA. The hph hygromycin B resistance gene sequence is a 1467 bp fragment which encodes hygromycin B phosphotransferase (HPh). Cell lines successfully transfected with the hph gene produce hygromycin B phosphotransferase and convert hygromycin B to 7"-O-phosphoryl-hygromycin B by phosphorylating the 4-hydroxyl group on the cyclitol ring of hygromycin B. 7"-O-phosphoryl-hygromycin B lacks antibiotic activity and does not interact with prokaryotic or eukaryotic ribosomes.

Spectrum: Hygromycin B is effective against eukaryotic (mammalian) and prokaryotic (bacteria, fungi/yeast) cells.

Microbiology Applications Hygromycin B can be used as a selection agent to isolate hygromycin b resistant bacteria and fungi. The following hygromycin B selection concentrations should serve as a guide only and may vary depending on experimental conditions and cells used:

- Bacteria (*E. coli*) - 50 µg/mL - 100 µg/mL
- Fungi - 100 µg/mL - 300 µg/mL
- Yeasts - 50 µg/mL - 200 µg/mL

Plant Biology Applications

Hygromycin B is routinely used as a selection agent for *Arabidopsis* plants that have been transformed with a hygromycin B resistance gene via *Arabidopsis* mediated transformation. A rapid method to screen for hygromycin B resistant *Arabidopsis* in less than four days has been developed and described by Samuel J Harrison et al. After *Arabidopsis* seeds have been transformed with a hygromycin B resistance plasmid (ex. pBIG-HYG), they are plated on MS medium with hygromycin B and subjected to a two day stratification period at 4°C in the dark. After stratification, seeds are exposed to light for 4-6 hours to stimulate germination and then placed in the dark for another two days. Transformed seeds are then selected and identified after a 24 hour period in the light. Hygromycin B resistant transformants are characterized by long hypocotyls (0.8 – 1.0cm vs. 0.2-0.4 cm).

References: Dai S., Zheng P., Marmey P., Zhang S., Tian W., Chen S., Beachy R.N. and Fauquet C. Comparative analysis of transgenic rice plants obtained by *Agrobacterium*-mediated transformation and particle bombardment. *Molecular Breeding* 7: 25–33, 2001. © 2001 Kluwer Academic Publishers.

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Borovinskaya, Mari A. et al. "Structural Basis for Hygromycin B Inhibition of Protein Biosynthesis." *Ncbi.nlm.nih.gov*. N.p., n.d. Web. 5 Sept. 2014.

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