

Product Name:	Validamycin
Product Number:	V012
CAS Number:	37248-47-8
Molecular Formula:	C ₂₀ H ₃₅ NO ₁₃
Molecular Weight:	497.50
Form:	Powder
Appearance:	White to pale yellow powder
Source:	<i>Streptomyces hygroscopicus</i>
pH:	3.0-5.0
Melting Point:	130-135°C
Storage Conditions:	-20° C
Description:	Validamycin is an antibiotic and fungicidal compound produced by <i>Streptomyces hygroscopicus</i>. Validamycin was first discovered in the broth of <i>Streptomyces hygroscopicus</i> var. <i>limoneus</i> T-7545, which was isolated from a soil sample collected in Akashi City, Hyogo Prefecture, Japan in 1970 (Iwasa et al., 1970), and also discovered 5 years later in the broth of <i>S. hygroscopicus</i> var. <i>jinggangensis</i> Yen. TH82, from a soil sample of Jinggang Mountain in Jiangxi, China. Validamycin is structurally similar to trehalose and acts as a competitive inhibitor for the enzyme trehalase, which is widely spread among animals, plants, insects, and microorganisms. Trehalase enzymes are responsible for trehalose degradation and serves an important role in regulation of such mechanisms as the active transport of glucose into the intestines, reserve supply of energy, germination of spores, etc. Validamycin is used to study trehalose biosynthesis and trehalase activity. Validamycin is soluble in water, methanol, DMSO, DMF, acetone, and ethanol.
Mechanism of Action:	Validamycin is structurally similar to trehalose and acts as a competitive inhibitor for trehalase, which is the enzyme responsible for trehalose degradation and serves an important role in regulation of such mechanisms as the active transport of glucose into the intestines, reserve supply of energy, germination of spores, etc.
Plant Biology Applications	Validamycin is effective against <i>Pellicularia sasakii</i> and <i>Rhizoctonia solani</i> in plants, but only decreases their virulence instead of exhibiting a fungicidal effect. Validamycin can be used to control sheath-blight disease in rice and is most effective against soil-borne pathogens. Validamycin was effective to control tomato bacterial wilt caused by <i>P. solanacearum</i> (Ishikawa et al., 1996)

**Insect Biology
Applications**

Validamycin inhibits the key enzyme trehalase (TRE) in insects, this enzyme is responsible for trehalose degradation and has important functions in insect growth and chitin synthesis. Validamycin has the potential for pest control uses.

References:

Copping LG [ed.], 2004. The Manual of Biocontrol Agents. Alton, UK: BCPC.

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