

IPTG (Isopropyl β -D-1-thiogalactopyranoside)

PRODUCT DATA SHEET

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Product Name:	IPTG (Isopropyl β -D-1-thiogalactopyranoside)
Product Number:	I011
CAS Number:	367-93-1
Molecular Formula:	$C_9H_{18}O_5S$
Molecular Weight:	238.3
Form:	Powder
Solubility:	Water: 50 mg/mL
Storage Conditions:	2-8°C
Description:	IPTG is a compound that induces transcription of the <i>lac</i> operon by mimicking allolactose, a lactose metabolite. IPTG is routinely used as a tool in cloning and gene recombination to confirm successful gene insertion.
Mechanism of Action:	IPTG induces the <i>lac</i> operon by binding to and releasing the <i>lac</i> repressor allowing transcription of <i>lac</i> genes including beta-galactosidase.
Microbiology Applications	IPTG can be used to confirm successful DNA recombination within the <i>lac</i> operon in cloning experiments. X-gal, a chromogenic substrate which turns a blue color when cleaved by IPTG can be used in the media in which the cells are grown. White colonies indicate a gene insertion within the <i>lac</i> operon because beta-galactosidase was not expressed. Blue colonies are indicative of an intact <i>lac</i> operon which expressed beta-galactosidase and subsequently cleaved X-gal.
References:	Chang, Lewis M., and N. C. Horton. "Crystal Structure of the Lactose Operon Repressor and Its Complexes with DNA and Inducer." <i>Europe PubMed Central</i> 271.5253 (1996): 1247-254. Europepmc.org. Web. 4 Dec. 2012.

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