

Lambda Phosphatase: sc-200312

BACKGROUND

Lambda Protein Phosphatase (Lambda PP) is a Mn^{2+} -dependent protein phosphatase with activity towards phosphorylated serine, threonine and tyrosine residues. It is the 221 amino-acid product of the ORF221 open reading frame on bacteriophage lambda^{1,3}.

The enzyme is inhibited by vanadate ions³ and can be heat inactivated at 65° C for 1 hour in the presence of 50 mM EDTA.

Purity: Minimum 95% (SDS-PAGE) with no detectable protease, DNase or RNase activity.

The product is supplied as a solution containing approximately 400,000 units protein per ml in 50 mM Tris-HCl, pH 7.5, with 0.1 mM EGTA, 0.01% BRIJ 35 and 50% glycerol.

Unit Definition: One unit will hydrolyze 1 nmol of p-nitrophenyl phosphate per minute at 30° C and pH 7.5.

Specific activity: ~600,000 units/mg

Molecular Weight: 25 kDa

REFERENCES

1. Cohen, P.T. and Cohen, P. 1989. Discovery of a protein phosphatase activity encoded in the genome of bacteriophage lambda. Probable identity with open reading frame 221. *Biochem. J.* 260: 931-934.
2. Gordon, J.A. 1991. Use of vanadate as protein-phosphotyrosine phosphatase inhibitor. *Meth. Enzymol.* 201: 477-482.
3. Zhuo, S., Clemens, J.C., Hakes, D.J., Barford, D. and Dixon, J.E. 1993. Expression, purification, crystallization, and biochemical characterization of a recombinant protein phosphatase. *J. Biol. Chem.* 268: 17754-17761.

SOURCE

Isolated from a strain of *E. coli* that carries the bacteriophage lambda ORF221 open reading frame under the control of a T7 expression system (kindly provided by Dr. D. Barford)³.

COMPONENTS

- Lambda Phosphatase (sc-200312/sc-200312A)
- 10X Lambda Phosphatase Buffer: 500 mM HEPES, pH 7.5, 1 mM EGTA, 50 mM dithiothreitol and 0.1% BRIJ 35
- 10X $MnCl_2$, 20 mM $MnCl_2$ solution

STORAGE

The product ships on blue ice and storage at or below -80° C is recommended. Upon receipt, it is recommended that the product be stored in working aliquots at -80° C to avoid repeated freeze/thaw cycles.

PRECAUTIONS

Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

PRODUCT

Lambda Phosphatase (100,000 units), sc-200312: Each vial contains 100,000 units in 0.25 ml of 50 mM Tris-HCl, pH 7.5, with 0.1 mM EGTA, 0.01% BRIJ 35 and 50% glycerol.

Lambda Phosphatase (20,000 units), sc-200312A: Each vial contains 20,000 units in 0.05 ml of 50 mM Tris-HCl, pH 7.5, with 0.1 mM EGTA, 0.01% BRIJ 35 and 50% glycerol.

RECOMMENDED USAGE

Lambda Phosphatase can be used to release phosphate groups from phosphorylated serine, threonine and tyrosine residues in proteins. Also active on phosphorylated histidine residues³.

PROCEDURE

The dephosphorylation activity of the enzyme will vary depending on the protein substrate. One must empirically determine the optimal reaction conditions for a particular phosphorylated substrate.

The reaction buffer is prepared by a 10-fold dilution of the supplied 10X Lambda Phosphatase Buffer, supplemented with 1X $MnCl_2$ solution, 2 mM (a 10-fold dilution) and incubated at 30° C.

General guideline for the dephosphorylation reaction: One hundred units of the lambda protein phosphatase will cleave approximately 100% of phosphates present in phosphorylated myelin basic protein (phosphate concentration is equivalent to 5 μ M) in 30 minutes in a 50 μ l reaction.

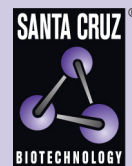
If phosphorylated protein source is a crude cellular or tissue extract, it may be necessary to include the appropriate protease inhibitors in your lysis buffer.

COMPANION PRODUCTS

- pNPP: sc-3720
- Bovine Serum Albumin: sc-2323
- EDTA: sc-29092
- Sodium Fluoride: sc-24988
- Sodium Orthovanadate: sc-3540

RESEARCH USE

For research use only, not for use in diagnostic procedures.



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MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

Catalog #: sc-200312
Product Name: Lambda Phosphatase
Supplier: Santa Cruz Biotechnology, Inc.
 2145 Delaware Avenue
 Santa Cruz, California 95060
 (831) 457-3800 / (800) 457-3801
 Fax: (831) 457-3801

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance Name	CAS #	
Lambda Phosphatase	None	
Ingredient Name	CAS #	Percent
Glycerol	56-81-5	50
Sodium Chloride	7647-14-5	< 1
Tris-HCl	77-86-1	< 1
Manganese Chloride	7773-01-5	< 1
DITHIOTHREITOL	3483-12-3	< 1
EGTA	67-42-5	< 1
HEPES	7365-45-9	< 1

3. HAZARDS IDENTIFICATION

Emergency Overview

Caution: Avoid contact and inhalation.

HMIS Rating

Health: 2
 Flammability: 0
 Reactivity: 0

NFPA Rating

Health: 2
 Flammability: 0
 Reactivity: 0

For additional information on toxicity, please refer to Section 11.

4. FIRST-AID MEASURES

Oral Exposure: If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure: If inhaled, remove to fresh air. If breathing is difficult, call a physician.

Dermal Exposure: In case of contact, immediately wash skin with soap and copious amounts of water. Remove clothing and call a physician.

Eye Exposure: In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

5. FIRE FIGHTING MEASURES

Flash Point: N/A

Autoignition Temperature: N/A

Flammability: N/A

Extinguishing Media: Suitable: Use extinguishing media appropriate to surrounding fire conditions.

Firefighting: Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6. ACCIDENTAL RELEASE MEASURES

Procedure(s) of Personal Precaution(s): Wear self-contained breathing apparatus, chemical safety goggles, rubber boots, and chemical resistant gloves. Wear disposable coveralls and discard them after use.

Methods for Cleaning Up: Absorb on sand or vermiculite and place in a closed container for disposal. Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Handling: User Exposure: Avoid contact with eyes, skin, and clothing. Avoid inhalation. Avoid prolonged or repeated exposure.

Storage: Suitable: Keep tightly closed. Store at -80° C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Safety shower and eye bath. Mechanical exhaust required.

Personal Protective Equipment:

Respiratory: NIOSH/MSHA-approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Compatible safety goggles.

General Hygiene Measures: Wash thoroughly after handling. Wash contaminated clothing before use. Avoid Inhalation

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Properties

Melting Point: 20° C

Boiling Point: 182° C

Flash Point: > 392° F, > 200° C

Exposure Limits in Air

Lower: 0.9%

Specific Gravity: 1.262

Solubility: Water -Z26130.

Vapor Pressure: < 1 mmHG at 20° C

Vapor Density: 3.1 G/L.

pH: 5.5-8.0

10. STABILITY AND REACTIVITY

Stability: Stable.

Materials to Avoid: Strong oxidizing agents, strong bases.
PROTECT FROM HEAT

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Route of Exposure

Eye Contact: May cause eye irritation.

Skin Contact: May cause skin irritation.

Multiple Routes: May be harmful by inhalation, ingestion or skin absorption.

Chronic Effects: Target organs, kidney.

Materials may be irritating to mucous membranes and upper respiratory tract.

RTECS #: GLYCEROL

To the best of our knowledge, the properties have not yet been thoroughly investigated.

IRRITATION DATA:

SKN-RBT 500	MG/24H MLD	85JCAE -, 207, 1986
EYE-RBT 126	MG MLD	BIOFX* 9-4/970
EYE-RBT 500	MG/24H MLD	85JCAE -, 207, 1986

TOXICITY DATA:

ORL-RAT LD50:	12600 MG/KG	FEPA7 4, 142, 1945
IHL-RAT LC50:	> 570 MG/M3/1H	BIOFX* 9-4/970
IPR-RAT LD50:	4420 MG/KG	RCOCB8 56, 125, 1987
SCU-RAT LD50:	100 MG/KG	NIIRDN 6, 215, 1982
IVN-RAT LD50:	5566 MG/KG	ARZNAD 26, 1581, 1976
ORL-MUS LD50:	4090 MG/KG	FRZKAP (6), 56, 1977
IPR-MUS LD50:	8700 MG/KG	ARZNAD 28, 1579, 1978
SCU-MUS LD50:	91 MG/KG	NIIRDN 6, 215, 1982
IVN-MUS LD50:	4250 MG/KG	JAPMA8 39, 583, 1950
ORL-RBT LD50:	27 GM/KG	DMDJAP 31, 276, 1959
SKN-RBT LD50:	>10 GM/KG	BIOFX* 9-4/970
IVN-RBT LD50:	53 GM/KG	NIIRDN 6, 215, 1982
ORL-GPG LD50:	7750 MG/KG	JIHTAB 23, 259, 1941

TARGET ORGAN DATA:

Gastrointestinal (nausea or vomiting)

Behavioral (headache)

Kidney, ureter, bladder (changes in tubules)

Kidney, ureter, bladder (changes in urine composition)

Paternal effects (spermatogenesis)

Paternal effects (testes, epididymis, sperm duct)

Effects on fertility (post-implantation mortality)

Effects on fertility (male fertility index)

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information.
<http://www.cdc.gov/niosh/rtecs.html>

12. ECOLOGICAL INFORMATION

Data not yet available.

13. DISPOSAL CONSIDERATIONS

Observe all federal state and local environmental regulations.

14. TRANSPORT INFORMATION

No classification currently assigned.

15. REGULATORY INFORMATION

N/A

16. OTHER INFORMATION

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. **This product is intended for research use only.**

EMERGENCY CONTACT:

ChemWatch

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Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112