

Product Information

**Polynucleotide phosphorylase
from *Synechocystis* species strain PCC6803
histidine-tagged, recombinant,
expressed in *Escherichia coli***

Catalog Number **N9914**

Storage Temperature $-70\text{ }^{\circ}\text{C}$

EC 2.7.7.8

Synonyms: Polyribonucleotide nucleotidyltransferase,
PNPase

Product Description

Polynucleotide phosphorylase (PNPase) is a bifunctional enzyme with a phosphorolytic 3' to 5' exoribonuclease activity and a 3'-terminal oligonucleotide polymerase activity.¹ It is also involved in mRNA processing and degradation in bacteria, plants, and humans.²

Synechocystis is a species of cyanobacteria. Cyanobacteria are prokaryotes believed to be related to the evolutionary ancestor of the chloroplast. RNA polyadenylation and degradation mechanisms in cyanobacteria and chloroplasts are very similar, but differ from the mechanisms found in *E. coli*.³

The *Synechocystis* PNPase enzymatic activity on different nucleotides may require different assay conditions, e.g., maximal polymerization activity was observed with CDP or UDP at $37\text{ }^{\circ}\text{C}$, pH 9.1; whereas, ADP and IDP polymerization were maximal at $42\text{ }^{\circ}\text{C}$. GDP polymerization is temperature sensitive and gave the lowest activity of all the nucleotides tested. At $55\text{ }^{\circ}\text{C}$ a more significant GDP polymerization activity was observed.

The subunit molecular mass of PNPase from *Synechocystis* species strain PCC6803 is 80 kDa with an apparent molecular mass (SDS-PAGE) of $\sim 85\text{ kDa}$.

The product is supplied as a solution in 20 mM HEPES buffer, pH 7.9, with 0.1 mM EDTA, 2 mM DTT, 12.5 mM MgCl_2 , 60 mM KCl, and 20% (w/v) glycerol.

Purity: $\geq 90\%$ (SDS-PAGE)

Specific activity: ≥ 500 units/mg-protein

Unit definition: One unit will polymerize 1.0 μmole of ADP, releasing 1.0 μmole of inorganic phosphate in 15 minutes at pH 9.1 at $37\text{ }^{\circ}\text{C}$.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store the product at $-70\text{ }^{\circ}\text{C}$. The product is stable for at least 2 years as supplied.

Avoid repeated freezing and thawing. After initial thawing, the enzyme may be kept for up to 2 months at $2-8\text{ }^{\circ}\text{C}$ or should be refrozen at $-20\text{ }^{\circ}\text{C}$ in aliquots.

References

1. Yehudai-Resheff, S., et al., Polynucleotide phosphorylase functions as both an exonuclease and a Poly (A) polymerase in spinach chloroplasts. *Mol. Cell. Biol.*, **21**, 5408-5416 (2001).
2. Liou, G.G., et al., RNA degradosomes exist *in vivo* in *Escherichia coli* as multicomponent complexes associated with the cytoplasmic membrane via the N-terminal region of ribonuclease E. *Proc. Natl. Acad. Sci. USA*, **98**, 63-68 (2001).
3. Rott, R., et al., RNA polyadenylation and degradation in cyanobacteria are similar to the chloroplast but different from *Escherichia coli*. *J. Biol. Chem.*, **278**, 15771-15777 (2003).

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