

## Product Information

**Phosphoglucomutase 1, human**  
recombinant, expressed in *Escherichia coli*

Catalog Number **SAE0022**  
Storage Temperature  $-20\text{ }^{\circ}\text{C}$

CAS RN 9001-81-4  
EC 5.4.2.2  
Synonyms: PGM1, CDG1T, GSD14

### Product Description

Phosphoglucomutase-1 (PGM1) is an evolutionarily conserved and well characterized enzyme that regulates one of the most important metabolic carbohydrate trafficking points in prokaryotic and eukaryotic organisms.<sup>1,2</sup> PGM1 catalyzes the bidirectional interconversion of glucose-1-phosphate (G-1-P) and glucose-6-phosphate (G-6-P). In one direction, G-1-P produced from sucrose catabolism is converted to G-6-P, the first intermediate in glycolysis. In the other direction, conversion of G-6-P to G-1-P generates a substrate for synthesis of UDP-glucose, which is required for synthesis of a variety of cellular constituents, including cell wall polymers and glycoproteins.<sup>2</sup>

There are several PGM isozymes, which are encoded by different genes. In most cell types the PGM1 isozyme is predominant, representing about 90% of total PGM activity.<sup>3</sup> Native PGM1 is known to be post-translationally modified by cytoplasmic glycosylation that does not seem to regulate its enzymatic activity but rather is implicated in the localization of the protein.<sup>1,4</sup>

Recent studies have identified PGM1 deficiency as an inherited metabolic disorder in humans. Affected patients show multiple disease phenotypes, reflecting the central role of the enzyme in glucose homeostasis. The influence of PGM1 deficiency on protein glycosylation patterns is also widespread.<sup>1,5</sup>

This product is recombinant human PGM1 expressed in *E. coli* and has a predicted molecular mass of 61.3 kDa. The product is lyophilized from a buffered solution containing Tris HCl, pH7.5, NaCl, EDTA, DTT, and a carbohydrate stabilizer.

Unit definition: One unit will convert 1.0  $\mu\text{mole}$  of  $\alpha\text{-D-Glucose-1-Phosphate}$  to  $\alpha\text{-D-Glucose-6-Phosphate}$  per minute at pH 7.4 at  $30\text{ }^{\circ}\text{C}$ .

### Precautions and Disclaimer

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

### Preparation Instructions

Reconstitute in deionized water to a concentration of 1-2 mg protein/ml.

### Storage/Stability

Store the product at  $-20\text{ }^{\circ}\text{C}$ .

After reconstitution, the product can be frozen in working aliquots at  $-20\text{ }^{\circ}\text{C}$  for at least one month. Repeated freezing and thawing is not recommended. Do not store in a frost-free freezer.

### References

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2. Gururaj, A. et al., Regulation of phosphoglucomutase 1 phosphorylation and activity by a signaling kinase. *Oncogene*, **23**, 8118–8127 (2004).
3. Wang, Y, and Zhang, Y.H.P., A highly active phosphoglucomutase from *Clostridium thermocellum*: cloning, purification, characterization and enhanced thermostability. *J. Appl. Microbiol.*, **108**, 39-46 (2010).
4. Ray, W.J. Jr, and Roscelli, G.A., The Phosphoglucomutase Pathway: An investigation of Phospho-Enzyme Isomerization. *J. Biol. Chem.*, **239**, 3935-3941 (1964).
5. Morava, E., Galactose supplementation in phosphoglucomutase-1 deficiency; review and outlook for a novel treatable CDG. *Mol. Genet. Metab.*, **112(4)**, 275-279 (2014).

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