

## Glucose-6-phosphate dehydrogenase

The hexose monophosphate shunt is an important metabolic pathway with the paramount goal in most cells to produce NADPH. Another typical capability is the transformation of hexoses into pentoses, e.g. the biosynthesis of D-ribose-5-phosphate essential in the biological formation of nucleic acids.

All enzymes of this pathway are accessible in highly purified form. First step in the sequence is the dehydrogenation of D-glucose-6-phosphate catalyzed by D-glucose-6-phosphatedehydrogenase. This reaction leads to 6-phosphogluconolacton (hence "phosphogluconate pathway") and NADPH.

SERVA offers enzymes from two different sources. The enzyme from *Leuconostoc mesenteroides* exhibits a dual coenzyme specificity, whereas that from yeast is specific for NADP<sup>+</sup>.

Both enzymes can be used as indicator enzymes in reactions where glucose-6-phosphate is the final product. They are commonly used in the determination of glucose in conjunction with hexokinase<sup>(1)</sup>, and in assays for creatine kinase(CPK)<sup>(4)</sup>. Glucose-6-phosphate dehydrogenase is also used in the determination of D-fructose<sup>(2)</sup> and sorbitol<sup>(3)</sup>.

### References:

1. Kunst, A. et al. (1984) Methods in Enzymatic Analysis (Bergmeyer, H.U., ed.) 3rd. Ed., Vol. 6, p. 163-72
2. Beutler, H.-O. (1984) loc. cit. p. 321 -7
3. Beutler H.-O. (1984) loc. cit. p. 356-62
4. Bergmeyer, H.U. et al. (1984) Methods in Enzymatic Analysis (Bergmeyer, H.U., ed.) 3rd. Ed., Vol. 2, p. 176-8

### Comparison of Glucose-6-phosphate dehydrogenase from *Leuconostoc mesenteroides* with that from yeast

Source	Yeast	<i>Leuconostoc mesenteroides</i>
Co-factors	NADP <sup>+</sup>	NAD <sup>+</sup> , NADP <sup>+</sup>
Optimum pH	9.2	7.0 - 8.5
Optimum temperature	ca. 55 °C	ca. 50 °C
pI	6.1	4.6
Stability	stable between pH 5 and 11	stable between pH 6 and 9
Effectors	Mg <sup>++</sup>	HCO <sub>3</sub> <sup>-</sup>
Inhibitors	Nucleoside monophosphates Some nucleoside di- and triphosphates Myristic acid, dihydroepiandrosterone, palmitoyl-CoA	Phosphate. ATP is a competitive inhibitor. NADPH is competitive in the NAD <sup>+</sup> - dependent reaction.

Product Name	Cat.No.
<b>Glucose-6-phosphate dehydrogenase from <i>Leuconostoc mesenteroides</i> ca. 600 U/mg protein suspension</b>	<b>22822</b>
<b>Glucose-6-phosphate dehydrogenase from yeast ca. 140 U/mg protein suspension</b>	<b>22820</b>