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Technical Product Data Sheet

Tech. Sheet #	003	**Version**	1.5	**Created:**	April 12th 2016	**by**	R.Peralta	**Last updated**	Feb. 11th 2025	**by**	S. Muñoz
Product Name	Glutamate dehydrogenase (GDH)			**Product Code**	enz_gdh_003	**Current Dev. Phase**		Finished			

Core information

Product Type	Lyophilized enzyme	**Producing microorganism**	*Escherichia coli* (recombinant)	**Microorg. code**	*BL21*	**Origin**	Thermophilic Bacteria
EC Number	1.4.1.2			**CAS-No.**	9001-46-1		
Product Description	Oxidoreductase enzyme which relates carbon and nitrogen metabolism, catalyzing the reduction of α-ketoglutarate and ammonia to L- glutamate .						

Temp Range ºC	20-70°C	**Opt. temp ºC**	50°C	**Thermo stability**	Keeps more than 85% of its activity after 8 hours of exposure at 50°C	**pH range**	7.0-8.5	**Opt. pH**	8.0

Substrate	α-ketoglutarate, NADH and ammonia		
Products	NAD^+, glutamate, H_2O		
Reaction	α-ketoglutarate + NADH + NH_4^+ → Glutamate + NAD^+ + H_20		
U (Unit definition)	One unit is defined as the conversion of 1µmol of α-ketoglutarate into glutamate, in 1 minute at 50°C at pH 8.0.		
Molecular mass	≈ 270 kDa	**Number of subunits**	Homohexameric (≈ 45 kDa subunit)
Substrate chirality	No data available		
Product chirality	No data available		
Alternative substrates	No determined		
Form	Lyophilized powder		
Other components	0.05M Tris Buffer and 0.5 M NaCl (before lyophilizing)		
Storage temperature	-20°C		
Stability	At -20°C, it maintains the reported activity (≥ 90 U/mg) at least for 14 months		
Shipping conditions	Inside a styrofoambox with icepacks		

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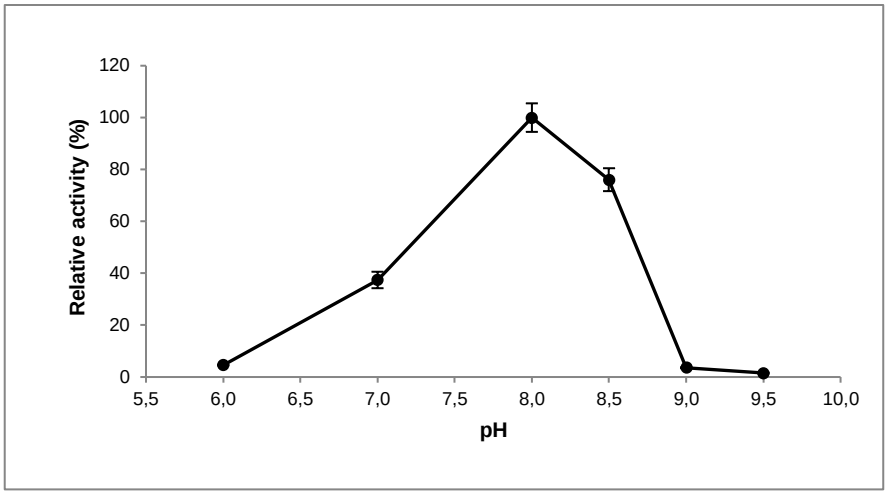
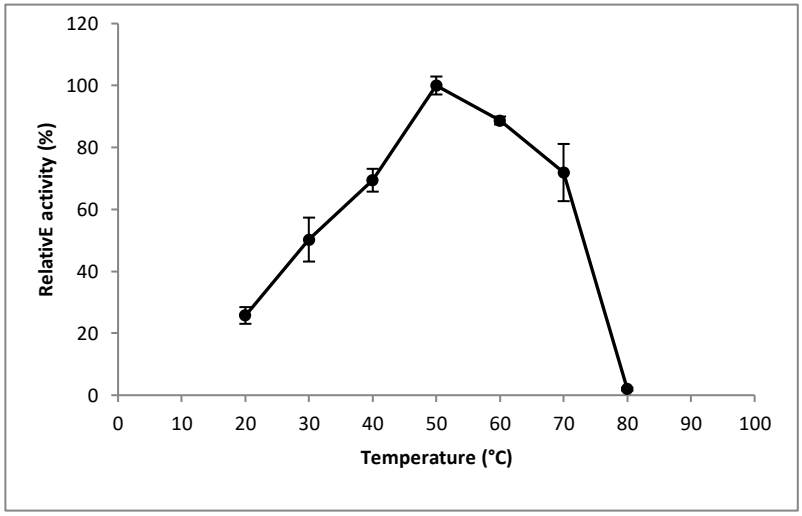
pH dependence	 **Fig 1.** pH dependence of the rec GDH (enz_gdh_003). Activity was measured by monitoring pH from 6.0 to 9.5 at 50°C.
Temperature dependence	 **Fig 2.** Temperature dependence of the rec GDH (enz_gdh_003). Activity was measured by monitoring temperature from 20 to 80º C in 50 mM Tris-HCl buffer (pH 8.0)

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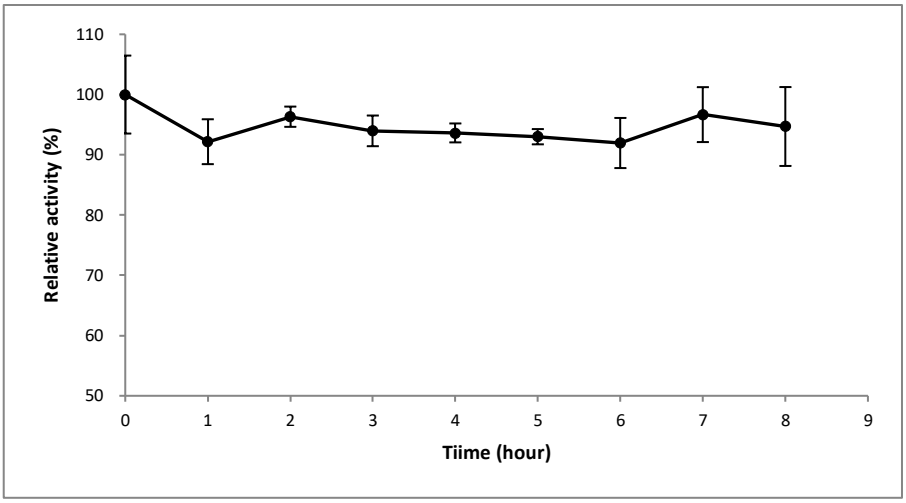
Thermo-stability	 **Fig 3.** Thermostability of the rec GDH (enz_gdh_003). Activity was measured by monitoring at 50º C using 50 mM Tris-HCl buffer (pH 8.0)

Scientific and Technical References

1. D P. Hornby, M J. Aitchison, P C.Engel. (1984).The kinetic mechanism of ox liver glutamate dehydrogenase in the presence of the allosteric effector ADP. The oxidative deamination of L-glutamate. Biochemical Journal 1984-10-01
2. M. Amenábar, J. Blamey. (2011). Purification and characterization of a thermostable glutamate dehydrogenase from a thermophilic bacterium isolated from a sterilization drying oven. Biochemistry and Molecular Biology Reports. 2, 91-95.
3. J. DiRuggiero, F. Robb, R. Jagus, H. Klump, K. Borges, M. Kessel, X. Mai, M. Adams. (1993). Characterization, cloning, and in Vitro expression of the extremely thermostable glutamate dehydrogenase from the hyperthermophilic archaeon, ES4. Journal of Biological Chemistry. 268,17767-17774.

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