



Product datasheet

Human PDH E1 alpha protein ELISA Kit (PDHA1)
ab181415

SimpleStep ELISA

1 References 4 Images

Overview

Product name	Human PDH E1 alpha protein ELISA Kit (PDHA1)				
Detection method	Colorimetric				
Precision	Intra-assay				
	Sample	n	Mean	SD	CV%
	HeLa extract	2			7.7%
	Inter-assay				
	Sample	n	Mean	SD	CV%
	HeLa extract	5			3.8%
Sample type	Tissue Extracts, Cell Lysate				
Assay type	Sandwich (quantitative)				
Sensitivity	12 ng/ml				
Range	15.62 ng/ml - 1000 ng/ml				
Recovery	135 %				
	Sample specific recovery				
	Sample type	Average %		Range	
	Serum	144		129% - 152%	
	Cell culture media	135		134% - 137%	
	Fetal Bovine Serum	135		129% - 130%	
Assay time	1h 30m				
Assay duration	One step assay				
Species reactivity	Reacts with: Human				

Product overview

Human PDH E1 alpha ELISA kit (ab181415) is a single-wash 90 min sandwich ELISA designed for the quantitative measurement of PDH E1 alpha protein in human cell and tissue extracts. It uses our proprietary SimpleStep ELISA® technology. Quantitate human PDH E1 alpha with 12 ng/mL sensitivity.

SimpleStep ELISA® technology employs capture antibodies conjugated to an affinity tag that is recognized by the monoclonal antibody used to coat our SimpleStep ELISA® plates. This approach to sandwich ELISA allows the formation of the antibody-analyte sandwich complex in a single step, significantly reducing assay time. See the SimpleStep ELISA® protocol summary in the image section for further details. Our SimpleStep ELISA® technology provides several benefits:

- Single-wash protocol reduces assay time to 90 minutes or less
- High sensitivity, specificity and reproducibility from superior antibodies
- Fully validated in biological samples
- 96-wells plate breakable into 12 x 8 wells strips

A 384-well SimpleStep ELISA® microplate ([ab203359](#)) is available to use as an alternative to the 96-well microplate provided with SimpleStep ELISA® kits.

Notes

The pyruvate dehydrogenase complex performs the decarboxylation of pyruvate into acetyl CoA, a critical function in metabolism, linking glycolysis and oxidative phosphorylation in mitochondria. The enzyme is composed of multiple copies of three enzymes: pyruvate dehydrogenase (E1), dihydrolipoamide transacetylase (E2) and dihydrolipoamide dehydrogenase (E3). The E1 enzyme is a tetramer of two alpha (PDHA1) and two beta (PDHB) subunits and is present in 30 copies in the PDH complex.

The activity of PDH is regulated by reversible phosphorylation of three serine residues on the PDHA1 subunit at phospho S232, phospho S293, and phospho S300. ELISA assays to measure phospho 232, and phospho S300 are available from Abcam ([ab115343](#), [ab115345](#)). The phosphorylation of these sites is catalyzed by PDH kinases (PDK). There are four known PDK isoforms, distributed differently in tissues. Their expressions are regulated differently by factors such as starvation, hypoxia and utilization of glucose and fatty acids in various tissues. Dephosphorylation, to restore the activity of PDH, is catalyzed by PDH phosphatases (PDP). There are two known isoforms of PDP; PDP1 is present in high levels in skeletal muscle and PDP2 in liver and adipocytes. Functional PDH kinases and phosphatases are available from Abcam ([ab110359](#), [ab110354](#), [ab110355](#), [ab110356](#)).

Platform

Microplate

Properties

Storage instructions

Store at +4°C. Please refer to protocols.

Components	1 x 96 tests
10X Human PDH E1a Capture Antibody	1 x 600µl
10X Human PDH E1a Detector Antibody	1 x 600µl
2X Cell Extraction Buffer LM	1 x 10ml

Components	1 x 96 tests
4X Antibody Diluent EB	1 x 6ml
Human PDH E1 alpha Lyophilized Recombinant Protein	2 vials
Plate Seals	1 unit
Sample Diluent NS (ab193972)	1 x 12ml
SimpleStep Pre-Coated 96-Well Microplate (ab206978)	1 unit
Stop Solution	1 x 12ml
TMB Development Solution	1 x 12ml

Function	The pyruvate dehydrogenase complex catalyzes the overall conversion of pyruvate to acetyl-CoA and CO(2). It contains multiple copies of three enzymatic components: pyruvate dehydrogenase (E1), dihydrolipoamide acetyltransferase (E2) and lipoamide dehydrogenase (E3).
Tissue specificity	Ubiquitous.
Involvement in disease	<p>Defects in PDHA1 are a cause of pyruvate decarboxylase E1 component deficiency (PDHE1 deficiency) [MIM:312170]. PDHE1 deficiency is the most common enzyme defect in patients with primary lactic acidosis. It is associated with variable clinical phenotypes ranging from neonatal death to prolonged survival complicated by developmental delay, seizures, ataxia, apnea, and in some cases to an X-linked form of Leigh syndrome (X-LS).</p> <p>Defects in PDHA1 are the cause of X-linked Leigh syndrome (X-LS) [MIM:308930]. X-LS is an early-onset progressive neurodegenerative disorder with a characteristic neuropathology consisting of focal, bilateral lesions in one or more areas of the central nervous system, including the brainstem, thalamus, basal ganglia, cerebellum, and spinal cord. The lesions are areas of demyelination, gliosis, necrosis, spongiosis, or capillary proliferation. Clinical symptoms depend on which areas of the central nervous system are involved. The most common underlying cause is a defect in oxidative phosphorylation. LS may be a feature of a deficiency of any of the mitochondrial respiratory chain complexes.</p>
Cellular localization	Mitochondrion matrix.

Images

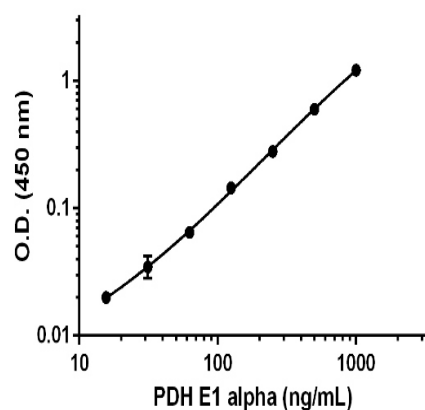


Figure 1

Example of PDH E1 alpha (PDHA1) standard curve. Background-subtracted data values (mean \pm SD) are graphed.

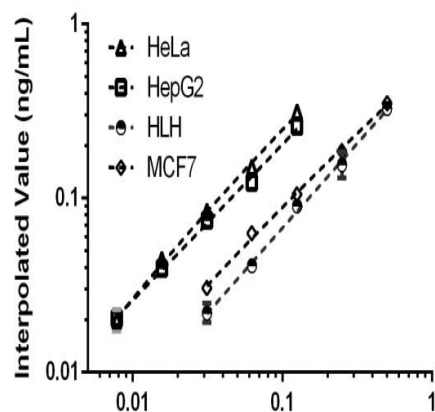
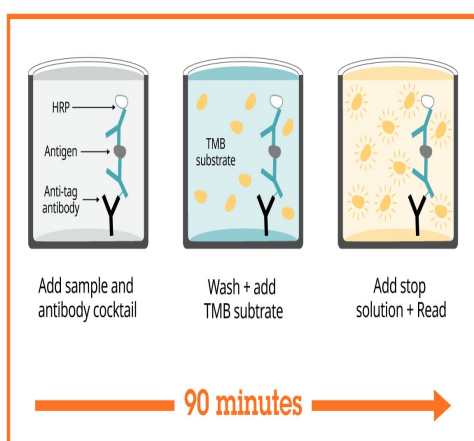


Figure 2

Titration of HeLa, HepG2, Human Liver Homogenate (HLH) and MCF7 cell extract within the working range of the assay in 1X Cell Extraction Buffer LM. Background subtracted data from duplicate measurements are plotted.



SimpleStep ELISA technology allows the formation of the antibody-antigen complex in one single step, reducing assay time to 90 minutes. Add samples or standards and antibody mix to wells all at once, incubate, wash, and add your final substrate. See protocol for a detailed step-by-step guide.

Sandwich ELISA - Human PDH E1 alpha protein
ELISA Kit (PDHA1) (ab181415)

**Get more done with
SimpleStep ELISA**



Easy to use
Single-wash 90-minute
protocol



Flexible
Matched antibody pairs
available



Precision antibodies
High sensitivity, specificity
and reproducibility



Scalable
Now in 10-pack and
384-well formats

To learn more about the advantages of SimpleStep ELISA[®] kits
see [here](#).

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