



Sino Biological  
Biological Solution Specialist

---

# Human Hemopexin / HPX ELISA Pair Set

**Catalog Number : SEK10870**

To achieve the best assay results, this manual must be read carefully before using this product and the assay is run as summarized in the General ELISA protocol.

## BACKGROUND

Hemopexin ( HPX ) is a serum glycoprotein responsible for the transport of haem to tissues such as liver, by receptor-mediated endocytosis, in an analogous manner to the iron transport protein transferrin, with recycling of intact haemopexin. Hemopexin binds heme with the highest affinity of any known protein. It performs functions in scavenging the heme released or lost by the turnover of heme proteins such as hemoglobin, protects the body from the oxidative damage that free heme can cause. In addition, hemopexin releases its bound ligand for internalisation upon interacting with a specific receptor situated on the surface of liver cells, thus implicated in preservation of the body's iron. High hemopexin levels indicate that there has been significant degradation of heme containing compounds and hemopexin is made to scavenge any heme it can, and high hemopexin levels are therefore one of the diagnostic features of a hemolytic anemia.

Hemopexin is an acute-phase plasma glycoprotein, produced mainly by the liver and released into plasma, where it binds heme with high affinity. Other sites of hemopexin synthesis are the nervous system, skeletal muscle, retina, and kidney. The only known receptor for the heme-hemopexin complex is the scavenger receptor, LDL receptor-related protein (LRP)1, which is expressed in most cell types, thus indicating multiple sites of heme-hemopexin complex recovery. Hemopexin is a heme-binding plasma glycoprotein which, after haptoglobin, forms the second line of defense against hemoglobin-mediated oxidative damage during intravascular hemolysis. A decrease in plasma hemopexin concentration reflects a recent release of heme compounds in the extracellular compartment. Heme-hemopexin complexes are delivered to hepatocytes by receptor-mediated endocytosis after which hemopexin is recycled to the circulation. Altered serum or plasma concentrations of hemopexin are found not only in hemolytic anemias but also in other conditions such as chronic neuromuscular diseases and acute intermittent porphyria. The diagnostic utility of hemopexin is less clear in other pathological conditions. Further studies are necessary to fully establish the clinical significance of hemopexin determination.

## PRINCIPLE OF THE TEST

The Sino Biological ELISA Pair Set is a solid phase sandwich ELISA (Enzyme-Linked Immunosorbent Assay). It utilizes a monoclonal antibody specific for Human Hemopexin / HPX coated on a 96-well plate. Standards and samples are added to the wells, and any Human Hemopexin / HPX present binds to the immobilized antibody. The wells are washed and a horseradish peroxidase conjugated rabbit anti-Human Hemopexin / HPX polyclonal antibody is then added, producing an antibody-antigen-antibody "sandwich". The wells are again washed and TMB substrate solution is loaded, which produces color in proportion to the amount of Human Hemopexin / HPX present in the sample. To end the enzyme reaction, the stop solution is added and absorbances of the microwell are read at 450 nm.

## INTENDED USE

- ◆The Human Hemopexin / HPX ELISA Pair Set is for the quantitative determination of Human Hemopexin / HPX.
- ◆This ELISA Pair Set contains the basic components required for the development of sandwich ELISAs.

## ASSAY PROCEDURE SUMMARY



**This Pair Set has been configured for research use only and is not to be used in diagnostic procedures.**

## MATERIALS PROVIDED

**Bring all reagents to room temperature before use.**

**Capture Antibody** – 1 mg/mL of mouse anti-Human Hemopexin / HPX monoclonal antibody (in PBS, pH 7.4). Dilute to a working concentration of 2 µg/mL in PBS before coating. (Catalog: # 10870-MM08)

**Detection Antibody** – 0.4 mg/mL of rabbit anti-Human Hemopexin / HPX polyclonal antibody conjugated to horseradish-peroxidase (HRP) (in PBS, 50 % glycerol, pH 7.4). Dilute to working concentration of 0.5 µg/mL in detection antibody dilution buffer before use.

**Standard** – Each vial contains 48 ng of recombinant Human Hemopexin / HPX. Reconstitute with 1 mL detection antibody dilution buffer. After reconstitution, store at -20°C to -80°C in a manual defrost freezer. A seven-point standard curve using 2-fold serial dilutions in sample dilution buffer, and a high standard of 1200 pg/mL is recommended.

## SOLUTIONS REQUIRED

**PBS** - 136.9 mM NaCl, 10.1 mM Na<sub>2</sub>HPO<sub>4</sub>, 2.7 mM KCl, 1.8 mM KH<sub>2</sub>PO<sub>4</sub>, pH 7.4, 0.2 µm filtered

**TBS** - 20 mM Tris, 150 mM NaCl, pH 7.4

**Wash Buffer** - 0.05% Tween20 in TBS, pH 7.2 - 7.4

**Blocking Buffer** - 2% BSA in Wash Buffer

**Sample dilution buffer** - 0.1% BSA in wash buffer, pH 7.2 - 7.4, 0.2 µm filtered

**Detection antibody dilution buffer** - 0.5% BSA in wash buffer, pH 7.2 - 7.4, 0.2 µm filtered

**Substrate Solution** : To achieve best assay results, fresh substrate solution is recommended

**Substrate stock solution** - 10mg / ml TMB ( Tetramethylbenzidine ) in DMSO

**Substrate dilution buffer** - 0.05M Na<sub>2</sub>HPO<sub>4</sub> and 0.025M citric acid ; adjust pH to 5.5

**Substrate working solution** - For each plate dilute 250 µl substrate stock solution in 25ml substrate dilution buffer and then add 80 µl 0.75% H<sub>2</sub>O<sub>2</sub> , mix it well

**Stop Solution** - 2 N H<sub>2</sub>SO<sub>4</sub>

## PRECAUTION

The Stop Solution suggested for use with this Pair Set is an acid solution. Wear eye, hand, face, and clothing protection when using this material.

## STORAGE

**Capture Antibody:** Aliquot and store at  $-20^{\circ}\text{C}$  to  $-80^{\circ}\text{C}$  for up to 6 months from date of receipt. Avoid repeated freeze-thaw cycles.

**Detection Antibody:** Protect it from prolonged exposure to light. Aliquot and store at  $-20^{\circ}\text{C}$  to  $-80^{\circ}\text{C}$  and for up to 6 months from date of receipt. Avoid repeated freeze-thaw cycles.

**Standard:** Store lyophilized standard at  $-20^{\circ}\text{C}$  to  $-80^{\circ}\text{C}$  for up to 6 months from date of receipt. Aliquot and store the reconstituted standard at  $-80^{\circ}\text{C}$  for up to 1 month. Avoid repeated freeze-thaw cycles.

## GENERAL ELISA PROTOCOL

### Plate Preparation

1. Dilute the capture antibody to the working concentration in PBS. Immediately coat a 96-well microplate with 100µL per well of the diluted capture antibody. Seal the plate and incubate overnight at 4°C.
2. Aspirate each well and wash with at least 300µl wash buffer, repeating the process two times for a total of three washes. Complete removal of liquid at each step is essential for good performance. After the last wash, remove any remaining wash buffer by inverting the plate and blotting it against clean paper towels.
3. Block plates by adding 300 µL of blocking buffer to each well. Incubate at room temperature for a minimum of 1 hour.
4. Repeat the aspiration/wash as in step 2. The plates are now ready for sample addition.

### Assay Procedure

1. Add 100 µL of sample or standards in sample dilution buffer per well. Seal the plate and incubate 2 hours at room temperature.
2. Repeat the aspiration/wash as in step 2 of plate preparation.
3. Add 100 µL of the detection antibody, diluted in antibody dilution buffer, to each well. Seal the plate and incubate 1 hour at room temperature.
4. Repeat the aspiration/wash as in step 2 of plate preparation.
5. Add 200 µL of substrate solution to each well. Incubate for 20 minutes at room temperature ( **if substrate solution is not as requested, the incubation time should be optimized** ). Avoid placing the plate in direct light.
6. Add 50 µL of stop solution to each well. Gently tap the plate to ensure thorough mixing.
7. Determine the optical density of each well immediately, using a microplate reader set to 450 nm.

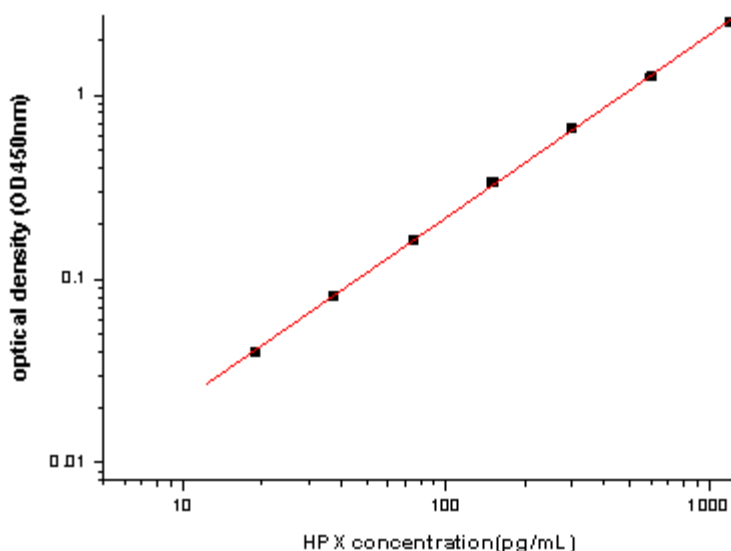
## CALCULATION OF RESULTS

- Calculate the mean absorbance for each set of duplicate standards, controls and samples. Subtract the mean zero standard absorbance from each.
- Construct a standard curve by plotting the mean absorbance for each standard on the y-axis against the concentration on the x-axis and draw a best fit curve through the points on the graph.
- To determine the concentration of the unknowns, find the unknowns' mean absorbance value on the y-axis and draw a horizontal line to the standard curve. At the point of intersection, draw a vertical line to the x-axis and read the concentration. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.
- Alternatively, computer-based curve-fitting statistical software may also be employed to calculate the concentration of the sample.

## TYPICAL DATA

This standard curve is only for demonstration purposes. A standard curve should be generated for each assay.

Concentration ( pg/mL)	Zero standard subtracted OD
0	0
18.8	0.040
37.5	0.081
75	0.162
150	0.337
300	0.660
600	1.262
1200	2.481



## PERFORMANCE CHARACTERISTIC

### SENSITIVITY

The minimum detectable dose of Human Hemopexin / HPX was determined to be approximately **18.8 pg/ml**. This is defined as at least three times standard deviations above the mean optical density of 10 replicates of the zero standard.

## TROUBLE SHOOTING

Problems	Possible Sources	Solutions
<b>No signal</b>	Incorrect or no Detection Antibody was added	Add appropriate Detection Antibody and continue
	Substrate solution was not added	Add substrate solution and continue
	Incorrect storage condition	Check if the kit is stored at recommended condition and used before expiration date
<b>Poor Standard Curve</b>	Standard was incompletely reconstituted or was inappropriately stored	Aliquot reconstituted standard and store at -80 °C
	Imprecise / inaccurate pipetting	Check / calibrate pipettes
	Incubations done at inappropriate temperature, timing or agitation	Follow the general ELISA protocol
	Background wells were contaminated	Avoid cross contamination by using the sealer appropriately
<b>Poor detection value</b>	The concentration of antigen in samples was too low	Enriching samples to increase the concentration of antigen
	Samples were ineffective	Check if the samples are stored at cold environment. Detect samples in timely manner
<b>High Background</b>	Insufficient washes	Use multichannel pipettes without touching the reagents on the plate
		Increase cycles of washes and soaking time between washes
	TMB Substrate Solution was contaminated	TMB Substrate Solution should be clear and colorless prior to addition to wells
	Materials were contaminated.	Use clean plates, tubes and pipettes tips
<b>Non-specificity</b>	Samples were contaminated	Avoid cross contamination of samples
	The concentration of samples was too high	Try higher dilution rate of samples



ELISA Plate Template												
	1	2	3	4	5	6	7	8	9	10	11	12
A												
B												
C												
D												
E												
F												
G												
H												

# **Human Hemopexin / HPX ELISA Pair Set**

## **Notes**