

GENLISA® 4-Hydroxynonenal, 4-HNE ELISA

REF : KLU0045

Ver 1.0

RUO

Enzyme Immunoassay for the Quantitative Determination of 4-Hydroxynonenal, 4-HNE in serum, plasma and other biological samples

RUO	For Research Use Only	REF	Catalog Number
	Store At	LOT	Batch Code
	Manufactured By		Biological Risk
	Expiry Date		Consult Operating Instructions

For Research Use Only. Purchase does not include or carry the right to resell or transfer this product either as a stand-alone product or as a component of another product. Any use of this product other than the permitted use without the express written authorization of Krishgen Biosystems Private Limited is strictly prohibited.

REF KLU0045

 96 tests

Krishgen Biosystems Private Limited

For US/Europe Customers: toll free +1(888)-970-0827 | tel +1(562)-568-5005
 For Asia/India Customers: +91(22)-49198700
 Email: sales1@krishgen.com | <http://www.krishgen.biz> / www.krishgenbio.com

GENLISA® 4-Hydroxynonenal, 4-HNE ELISA

Introduction:

The GENLISA® ELISA kits are used for assessing the specific biomarker in samples analytes which may be serum, plasma and cell culture supernatant as validated with the kit. The kit employs a competitive ELISA technique.

Intended Use:

The GENLISA® 4-Hydroxynonenal, 4-HNE ELISA kit is used as an analytical tool for quantitative determination of 4-Hydroxynonenal, 4-HNE serum, plasma and other biological samples.

Principle:

The method employs competitive enzyme-linked immunosorbent assay ELISA technique to assay the level of 4-Hydroxynonenal, 4-HNE in samples. Standards or Samples competes with the 4-Hydroxynonenal, 4-HNE antigen coated microtiter well, to form a complex with the Biotinylated 4-HNE antibody. Wells are washed to remove the excess conjugate and Streptavidin:HRP Conjugate is added to the microplate and incubated. After incubation and a washing step TMB Substrate, are added. Blue color develops on incubation and the reaction is stopped with a Stop Solution to form a yellow color. The concentration of the 4-Hydroxynonenal, 4-HNE, in the samples is inversely proportional to the yellow color developed (absorbance) in the wells.

Materials Provided:

1. 4-HNE Antigen Coated Microtiter Plate (8 x 12 wells) - 1 no
2. 4-HNE Standard (lyophilized, concentrated, 2000 pg/ml) - 2 vials
3. Biotinylated 4-HNE Antibody (concentrated) - 60 ul
4. Streptavidin:HRP Conjugate (concentrated) - 120 ul
5. Sample Diluent 1 - 20 ml
6. Sample Diluent 2 - 20 ml
7. Biotin Antibody Dilution Buffer - 10 ml
8. HRP Conjugate Dilution Buffer - 10 ml
9. (20X) Wash Buffer - 25 ml
10. TMB Substrate - 12 ml
11. Stop Solution - 12 ml
12. Instruction Manual

Materials to be provided by the End-User:

1. Microtiter Plate Reader able to measure absorbance at 450 nm.
2. Adjustable pipettes and multichannel pipettor to measure volumes ranging from 25 ul to 1000 ul.
3. Deionized (DI) water.
4. Wash bottle or automated microplate washer.
5. Clean tubes and Eppendorf tubes.
6. Precision single and multi-channel pipette and disposable tips.
7. 37°C incubator.
8. Timer.

Handling/Storage:

1. All reagents should be stored as indicated on the component label.
2. All the reagents and wash solutions should be used within 12 months from manufacturing date.
3. Before using, bring all components to room temperature (18-25°C). Upon assay completion ensure all components of the kit are returned to appropriate storage conditions.
4. The Substrate is light-sensitive and should be protected from direct sunlight or UV sources.

Health Hazard Warnings:

1. Reagents that contain preservatives may be harmful if ingested, inhaled or absorbed through the skin.
2. For Research Use Only.


Sample Preparation and Storage:

Specimens should be clear and non-hemolyzed. Samples should be run at a number of dilutions to ensure accurate quantitation.

1. Extract as soon as possible after specimen collection as per relevant procedure. The samples should be tested as soon as possible after the extraction. Alternately the extracted samples can be kept in -20°C. Avoid repeated freeze-thaw cycles.
2. **Serum-** Coagulate at room temperature for 10-20 minutes; centrifuge for 20-min at 2000-3000 rpm. Remove the supernatant. If precipitation appears, recentrifuge.
3. **Plasma-** Use EDTA or citrate plasma as an anticoagulant, mix for 10-20 minutes; centrifuge for 15-min at 2000-3000 rpm. Remove the supernatant carefully. If precipitation appears, recentrifuge.
4. **Urine-** Collect urine in a sterile container, centrifuge for 20-min at 2000-3000 rpm. Remove the supernatant. If precipitation appears, recentrifuge.
5. **Cell Culture Supernatant-** Collect sample in a sterile container. Centrifuge for 20-mins at 2000-3000 rpm. Remove the supernatant carefully. When examining the components within the cell, dilute cell suspension with PBS (pH 7.2-7.4), if cell concentration is greater than 1 million/ml. Damage the cells by repeated freeze-thaw cycles to release intracellular components. Centrifuge for 20-min at 2000-3000 rpm. If precipitation appears, centrifuge again.
6. **Tissue Samples-** Rinse tissues in PBS (pH 7.4) to remove excess blood thoroughly and weigh before homogenization. Mince tissues and homogenize them in PBS (pH7.4) with a glass homogenizer on ice. Thaw at 2-8°C or freeze at -20°C. Centrifuge at 2000-3000 RPM for approximately 20 minutes and collect the supernatant carefully.

Note: Grossly hemolyzed samples are not suitable for use in this assay.

Sample Dilution

The user should estimate the concentration of target protein in the test sample, and select a proper dilution factor to make the diluted target protein concentration fall in the optimal detection range of the kit. Dilute the sample with the provided sample diluent, and several trials may be necessary. The test sample must be well mixed with the sample diluent. And also standard curves and sample should be making in pre-experiment. If samples with very high concentrations, dilute samples with PBS first and then dilute the samples with the Sample Diluent.

Please refer to the following table of recommended dilution ratio for 4-Hydroxynonenal, 4-HNE samples for reference.

Dilution Fold	Sample	Sample Diluent 1	Sample Diluent 2	Total Diluted Sample Volume
1/2	60 ul	60 ul	---	120 ul
1/5	24 ul	96 ul	---	120 ul
1/10	12 ul	108 ul	---	120 ul
1/20	6 ul	114 ul	---	120 ul
1/50	3 ul	---	47 ul	50 ul + 100 ul Sample Diluent 1
1/100	3 ul	---	177 ul	180 ul + 120 ul Sample Diluent 1
1/1000	2 step dilution. Create a 50 fold dilution and then make a 20 fold dilution Sample diluent 2 is used throughout the dilution			
1/10000	2 step dilution. Create a 100 fold dilution and then make a 100 fold dilution using Sample diluent 2 is used throughout the dilution			
1/100000	3 step dilution. Create a 50 fold dilution and then make a 20 fold dilution. Finally create a 100 fold dilution using Sample diluent 2 is used throughout the dilution			

Note: The volume in each dilution is not less than 3 ul. Dilution factor should be within 100 fold. Mix well during dilution and avoid foaming

Reagent Preparation (all reagents should be diluted immediately prior to use):

1. Label any aliquots made with the kit Lot No and Expiration date and store it at appropriate conditions mentioned.

GENLISA® 4-Hydroxynonenal, 4-HNE ELISA

- Bring all reagents to Room temperature before use.
- To make **Wash Buffer (1X) 500 ml**; dilute **25 ml of (20X) Wash Buffer in 475 ml of DI water**.
- Biotinylated 4-HNE Antibody Working Solution**: Prepare it within 30 minutes before experiment. Calculate required total volume of the working solution: 0.05 ml / well x quantity of wells. (Allow 0.1-0.2 ml more than the total volume. Dilute the Biotinylated 4-HNE Antibody (concentrated) with Biotin Antibody Dilution Buffer at 1:100 and mix them thoroughly (i.e. Add 1 ul Biotinylated 4-HNE Antibody into 99 ul Biotin Antibody Dilution Buffer).
- Streptavidin:HRP Conjugate Working Solution**: Prepare it within 30 minutes before experiment. Calculate required total volume of the working solution: 0.1 ml / well x quantity of wells. (Allow 0.1-0.2 ml more than the total volume. Dilute the Streptavidin:HRP Conjugate with Streptavidin:HRP Conjugate Dilution Buffer at 1:100 and mix them thoroughly (i.e. Add 1 ul of Streptavidin:HRP Conjugate into 99 ul of Streptavidin:HRP Conjugate Dilution Buffer).
- Standards Preparation**: Reconstitute original 4-Hydroxynonenal, 4-HNE Standard with 1.0 ml of Sample Diluent 1. Keep the standard for 10 mins with gentle agitation before making further dilutions. Prepare the additional Standards by serially diluting the standard stock solution as per the below table.

Standard Concentration	Standard Vial	Dilution Particulars
2000 pg/ml	Standard No.8	Reconstitute with 1 ml Sample Diluent 1
1000 pg/ml	Standard No.7	300 ul Standard No.8 + 300 ul Sample Diluent 1
500 pg/ml	Standard No.6	300 ul Standard No.7 + 300 ul Sample Diluent 1
250 pg/ml	Standard No.5	300 ul Standard No.6 + 300 ul Sample Diluent 1
125 pg/ml	Standard No.4	300 ul Standard No.5 + 300 ul Sample Diluent 1
62.5 pg/ml	Standard No.3	300 ul Standard No.4 + 300 ul Sample Diluent 1
31.25 pg/ml	Standard No.2	300 ul Standard No.3 + 300 ul Sample Diluent 1
0 pg/ml	Standard No.1	300 ul Sample Diluent 1 only

Procedural Notes:

- In order to achieve good assay reproducibility and sensitivity, proper washing of the plates to remove excess un-reacted reagents is essential.
- High Dose Hook Effect may be observed in samples with very high concentrations of 4-Hydroxynonenal, 4-HNE. High Dose Hook Effect is due to excess of antibody for very high concentrations of 4-Hydroxynonenal, 4-HNE, present in the sample.
- 4-Hydroxynonenal, 4-HNE, concentration of the undiluted sample is less than the diluted sample, this may be indicative of the Hook Effect.
- Avoid assay of Samples containing sodium azide (NaN_3), as it could destroy the HRP activity resulting in under-estimation of the amount of 4-Hydroxynonenal, 4-HNE.
- It is recommended that all Standards and Samples be assayed in duplicates or triplicates.
- Maintain a repetitive timing sequence from well to well for all the steps to ensure that the incubation timings are same for each well.
- If the Substrate has a distinct blue color prior to use it may have been contaminated and use of such substrate can lead to compromisation of the sensitivity of the assay.
- The plates should be read within 30 minutes after adding the Stop Solution.
- Make a work list in order to identify the location of Standards and Samples.

Assay Procedure:

- It is strongly recommended that all Standards and Samples be run in duplicates or triplicates. A standard curve is required for each assay.
- Add **50 ul prepared Standards and Samples** to respective wells.
- Pipette **50 ul Biotinylated 4-HNE Antibody Working Solution** to all wells.
- Cover the plate with a sealer and incubate for 45 minutes at 37°C.
- Aspirate and wash plate 4 times with diluted Wash Buffer (1X) and blot residual buffer by firmly tapping plate upside down on absorbent paper. Wipe of any liquid from the bottom outside of the microtiter wells as any residue can interfere in the reading step.

GENLISA® 4-Hydroxynonenal, 4-HNE ELISA

6. Pipette **100 ul Streptavidin:HRP Conjugate Working Solution** to all wells. Mix well.
7. Cover the plate with a sealer and incubate for 30 minutes at 37°C.
8. Aspirate and wash as per Step (5) above.
9. Pipette **100 ul TMB Substrate** in all the wells.
10. Incubate the plate at **37°C for 10 minutes**. DO NOT SHAKE or else it may result in higher backgrounds and worse precision.
11. Pipette **100 ul of Stop Solution** to all wells. The wells should turn from blue to yellow in color.
12. Read the absorbance at 450 nm with a microplate within 10-15 minutes after addition of Stop solution.

Calculation of Results:

Determine the Mean Absorbance for each set of duplicate or triplicate Standards and Samples. Using Graph Paper, plot the average value (absorbance 450nm) of each standard on the Y-axis versus the corresponding concentration of the standards on the X-axis. Draw the best fit curve through the standard points. To determine the unknown 4-Hydroxynonenal, 4-HNE concentrations, find the unknown's 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 4-Hydroxynonenal, 4-HNE Concentration.

If samples were diluted, multiply by the appropriate dilution factor. Software which is able to generate a cubic spline curve-fit or 4-PL is best recommended for automated results.

Note:

It is recommended to repeat the assay at a different dilution factor in the following cases:

- If the sample absorbance value is below the first standard.

Quality Control:

It is recommended that for each laboratory assay appropriate quality control samples in each run to be used to ensure that all reagents and procedures are correct.

Performance Characteristics of the Kit:

This kit has been validated. Please view the details herein below.

Standard Calibration Range:

31.25 pg/ml – 2000 pg/ml.

Sensitivity:

Limit of Quantification: It is defined as the lowest detectable concentration that can be determined with an acceptable repeatability and the LOQ was found to be 18.75 pg/ml.

Specificity:

This assay has high sensitivity and excellent specificity for detection of 4-Hydroxynonenal, 4-HNE. No significant cross-reactivity or interference between 4-Hydroxynonenal, 4-HNE and analogues was observed.

Recovery

Matrices listed below were spiked with certain level of 4-Hydroxynonenal, 4-HNE and the recovery rates were calculated by comparing the measured value to the expected amount of 4-Hydroxynonenal, 4-HNE in samples.

Matrix	Recovery Range (%)	Average (%)
Serum(n=5)	91-99	95
EDTA Plasma(n=5)	85-104	95
Heparin Plasma(n=5)	87-99	91

Precision:

Intra-Assay: CV<8%
Inter-Assay: CV<10%

Linearity

The linearity of the kit was assayed by testing samples spiked with appropriate concentration of 4-Hydroxynonenal, 4-HNE and their serial dilutions. The results were demonstrated by percentage of calculated concentration to the expectation.

Sample	1:2	1:4	1:8
Serum(n=5)	88-105%	87-104%	91-102%
EDTA Plasma(n=5)	86-100%	89-101%	93-97%
Heparin Plasma(n=5)	80-98%	90-96%	80-99%

Safety Precautions:

- **This kit is For Research Use only.** Follow the working instructions carefully.
- The expiration dates stated on the kit are to be observed. The same relates to the stability stated for reagents.
- Do not use or mix reagents from different lots.
- Do not use reagents from other manufacturers.
- Avoid time shift during pipetting of reagents.
- All reagents should be kept in the original shipping container.
- Since the kit contains potentially hazardous materials, the following precautions should be observed.
 - Do not smoke, eat or drink while handling kit material.
 - Always use protective gloves.
 - Never pipette material by mouth.
 - Wipe up spills promptly, washing the affected surface thoroughly with a decontaminant.
- In any case GLP should be applied with all general and individual regulations to the use of this kit.



Typical Example of a Work List

Well #	Contents	Absorbance at 450nm	Mean Absorbance	Interpolated Concentration
1A	Standard No.1			
2A	Standard No.1			
1B	Standard No.2			
2B	Standard No.2			
1C	Standard No.3			
2C	Standard No.3			
1D	Standard No.4			
2D	Standard No.4			
1E	Standard No.5			
2E	Standard No.5			
1F	Standard No.6			
2F	Standard No.6			
1G	Standard No.7			
2G	Standard No.7			
1H	Standard No.8			
2H	Standard No.8			
3A	Sample			
4A	Sample			
3B	Sample			
4B	Sample			

LIMITED WARRANTY

Krishgen Biosystems Private Limited does not warrant against damages or defects arising in shipping or handling, or out of accident or improper or abnormal use of the Products; against defects in products or components not manufactured by Krishgen Biosystems Private Limited, or against damages resulting from such non-Krishgen Biosystems Private Limited made products or components. Krishgen Biosystems Private Limited passes on to customer the warranty it received (if any) from the maker thereof of such non Krishgen made products or components. This warranty also does not apply to Products to which changes or modifications have been made or attempted by persons other than pursuant to written authorization by Krishgen Biosystems Private Limited.

THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Krishgen Biosystems Private Limited shall be to repair or replace the defective Products in the manner and for the period provided above. Krishgen Biosystems Private Limited shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, and strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Krishgen Biosystems Private Limited be liable for incidental, special, or consequential damages.

This Limited Warranty states the entire obligation of Krishgen Biosystems Private Limited with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

Krishgen Biosystems Private Limited. 2026

THANK YOU FOR USING A KRISHGEN PRODUCT!

KRISHGEN BIOSYSTEMS PRIVATE LIMITED®, DHARMAPLEX®, GENBULK®, GENLISA®, KRISHZYME®, KRISHGEN®, KRIBIOLISA®, KRISHPLEX®, TITANIUM®, QUALICHEK® are registered trademarks of KRISHGEN BIOSYSTEMS PRIVATE LIMITED.

©KRISHGEN BIOSYSTEMS PRIVATE LIMITED. ALL RIGHTS RESERVED.

KRISHGEN BIOSYSTEMS PRIVATE LIMITED | OUR REAGENTS | YOUR RESEARCH |

SYMBOLS KEY

	Coated Microtiter Plate (8x12 wells)
	Standard
	Biotinylated Antibody
	Conjugate Horseradish Peroxidase
	Biotin Antibody Dilution Buffer
	HRP Conjugate Dilution Buffer
	Sample Diluent 1
	Sample Diluent 2
	(20X) Wash Buffer
	TMB Substrate
	Stop Solution
	Consult Instructions for Use
	Catalog Number
	Expiration Date
	Storage Temperature