Human Immunoglobulin D, IgD GENLISA™ ELISA

REF : KBH0174

Ver 3.0

RUO

Enzyme Immunoassay for the Quantitative Determination of Human Immunoglobulin D, IgD 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

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REF KBH0174 Σ 96 tests

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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 sandwich ELISA technique which leads to a higher specificity and increased sensitivity compared to conventional competitive ELISA kits which employ only one antibody. Double antibodies are used in this kit.

Intended Use:

The Human Immunoglobulin D, IgD GENLISA™ ELISA kit is used as an analytical tool for quantitative determination of Human Immunoglobulin D, IgD in serum, plasma and other biological samples.

Principle:

The method employs sandwich ELISA technique. Monoclonal antibodies are pre-coated onto microwells. Samples and standards are pipetted into microwells and Human Immunoglobulin D, IgD present in the sample are bound by the antibodies. Biotin labeled IgD antibody is added and followed by Streptavidin-HRP is pipetted and incubated to form a complex. After washing microwells in order to remove any non-specific binding, the substrate solution (TMB) is added to microwells and color develops proportionally to the amount of Human Immunoglobulin D, IgD in the sample. Color development is then stopped by addition of stop solution. Absorbance is measured at 450 nm.

Materials Provided:

Part	Description	Qty
Rabbit Anti-Human IgD Antibody Coated Microtiter Plate	96 well polystyrene microplate (12 strips of 8 wells) coated with Rabbit Anti-Human IgD Antibody.	1 x 96 wells
Human IgD Standard	Recombinant Human IgD standard – (lyophilized ; 0.5 IU/ml)	2 vials
Biotinylated IgD Antibody Biotin	Biotinylated IgD prepared in buffer with protein stabilizer and preservatives 0.02% methylisothiazolone and 0.02% 5bromonitrodioxane.	12 ml
(1X) Standard Diluent	Buffered protein base with protein stabilizer and preservative thiomersol < 0.01%	10 ml
(1X) Sample Diluent	Buffered protein base with BSA and preservative thiomersol < 0.01%	50 ml
Streptavidin – HRP	Concentrated Streptavidin HRP - (20ul)	1 vial
Streptavidin –HRP diluent	Buffer with protein stabilizer and preservatives 0.02% methylisothiazolone and 0.02% bromonitrodioxane.	12 ml
(20X) Wash Buffer	20-fold concentrated solution of buffered surfactant with preservative thiomersol < 0.01%. May turn yellow over time.	25 ml
TMB Substrate	Stabilized Chromogen	12 ml
Stop Solution	0.73M Phosphoric Acid	12 ml
Instruction Manual		1 no

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. Graph paper or software for data analysis
6. Timer
7. Absorbent Paper

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 (18-25ºC). 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.

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

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.
2. Bring all reagents to Room temperature before use.
3. **Streptavidin HRP conjugate solution** – Add 1ul of Concentrated Strep HRP to 899ul of Strep HRP diluent to Streptavidin HRP conjugate solution. This solution is used in the experiment.
4. To make **Wash Buffer (1X)**; dilute **25 ml of 20X Wash Buffer in 475 ml of DI water**.
5. **Standards Preparation**: Reconstitute the lyophilized standard in 1ml Standard Diluent (1X) to get 0.5 IU/ml. Dilute 480 ul of reconstituted **Standard (500 mIU/ml)** with 520 ul of Standard Diluent (1X) to generate a **240 IU/ml Standard stock solution** Prepare further **Standards** by serially diluting the standard stock solution as per the below table.

Standard Concentration	Standard Vial	Dilution Particulars
0.5 IU/ml	Original Standard	Original Standard provided in the Kit + 1ml Standard Diluent (1X)
240 mIU/ml	Standard No.7	480 ul Reconstituted Standard (0.5 IU/ml) + 520 ul Standard Diluent (1X)
120 mIU/ml	Standard No.6	500 ul Standard No.7 + 500 ul Standard Diluent (1X)
60 mIU/ml	Standard No.5	500 ul Standard No.6 + 500 ul Standard Diluent (1X)
30 mIU/ml	Standard No.4	500 ul Standard No.5 + 500 ul Standard Diluent (1X)
15 mIU/ml	Standard No.3	500 ul Standard No.4 + 500 ul Standard Diluent (1X)
7.5 mIU/ml	Standard No.2	500 ul Standard No.3 + 500 ul Standard Diluent (1X)
3.75 mIU/ml	Standard No.1	500 ul Standard No.2 + 500 ul Standard Diluent (1X)
0 mIU/ml	Standard No.0	500 ul Standard Diluent (1X)

Procedural Notes:

1. In order to achieve good assay reproducibility and sensitivity, proper washing of the plates to remove excess un-reacted reagents is essential.
2. High Dose Hook Effect may be observed in samples with very high concentrations of Human Immunoglobulin D, IgD. High Dose Hook Effect is due to excess of antibody for very high concentrations of Human Immunoglobulin D, IgD present in the sample.
3. Human Immunoglobulin D, IgD concentration of the undiluted sample is less than the diluted sample, this may be indicative of the Hook Effect.
4. Avoid assay of Samples containing sodium azide (NaN_3), as it could destroy the HRP activity resulting in under-estimation of the amount of Human Immunoglobulin D, IgD.
5. It is recommended that all Standards and Samples be assayed in duplicates or triplicates.
6. Maintain a repetitive timing sequence from well to well for all the steps to ensure that the incubation timings are same for each well.
7. 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.
8. The plates should be read within 30 minutes after adding the Stop Solution.
9. Make a work list in order to identify the location of Standards and Samples.

Assay Procedure:

1. It is strongly recommended that all Standards and Samples be run in duplicates or triplicates. A standard curve is required for each assay.

2. Add **100 ul prepared Standards or Samples** to the wells and incubate at **Room Temperature** for **1 hour**.

3. 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.

4. Add **100 ul Biotinylated IgD Antibody** to the wells and incubate at **Room Temperature** for **1 hour**.

5. 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.

6. Add **100 ul Streptavidin:HRP Conjugate solution** to all wells and incubate at **Room Temperature** for **30 minutes**.

7. 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.

8. Add **100 ul TMB Substrate** to all wells.

9. Incubate the plate at **Room Temperature** for **30 minutes**. DO NOT SHAKE or else it may result in higher backgrounds and worse precision. Positive wells should turn bluish in color.

10. Pipette **100 ul** of **Stop Solution** to all wells. The wells should turn from blue to yellow in color.

11. Read the absorbance at 450 nm with a microplate within 30 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 Human Immunoglobulin D, IgD 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 Human Immunoglobulin D, IgD Concentration.

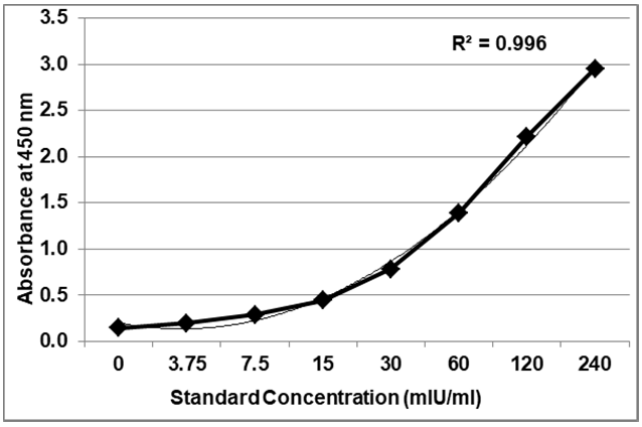
If samples were diluted, multiply by the appropriate dilution factor. Software which is able to generate a cubic spline curve-fit or 4PL is best recommended for automated results.

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.

Typical Data

Standard Concentration (mIU/ml)	Mean Absorbance	Interpolated Concentration	% Interpolated Concentration against Actual Concentration
0	0.146	--	--
3.75	0.195	3.4	90.1
7.5	0.285	8.1	107.7
15	0.441	15.1	100.9
30	0.782	29.9	99.7
60	1.390	59.6	99.3
120	2.217	120.8	100.7
240	2.951	239.3	99.7

Typical Graph



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:
3.75 mIU/ml – 240 mIU/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 3 IU/ml.

Specificity:
The antibodies used in this kit are monoclonal antibodies specific for Human Immunoglobulin D.

Precision:
Intra-Assay Precision: 3 samples (n=3) with low, middle and high concentration of Human Immunoglobulin D were tested in triplicate respectively. The Intra-Assay was found to be <15%

Inter-Assay Precision: 3 samples (n=3) with low, middle and high concentration of Human Immunoglobulin D were tested in triplicate on two plates respectively on two consecutive days. The Inter-Assay was found to be <18%.

The Cumulative Variance % was calculated as CV (%) = SD/mean x 100 [SD=standard deviation]

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.
- Some of the reagents contain small amount of sodium azide (< 0.1 % w/w) as preservative. They must not be swallowed or allowed to come into contact with skin or mucosa.
- Source materials maybe derived from Human body fluids or organs used in the preparation of this kit were tested and found negative for HBsAg and HIV as well as for HCV antibodies. However, no known test guarantees the absence of such viral agents. Therefore, handle all components and all patient samples as if potentially hazardous.
- 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.

SCHEMATIC ASSAY PROCEDURE

1. Remove all components, 30 minutes before adding into the assay plate.

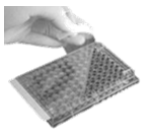
Components (2-8ºC) → 30 mins RT Before Use → 

Thaw at Room Temperature (18-24ºC) → USE NOW

2. Avoid repeated cool-thaw of the components as there will be a loss of activity and this can affect the results.

Kit Components → AVOID → COOL (2-8ºC) → THAW (22±4ºC) → THAW (22±4ºC) → COOL (2-8ºC) → AVOID → NO CHANGE IN RESULTS

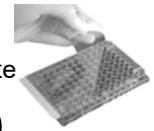
3.  Pipette **100 ul Standards / Samples** into each well.

4. Cover plate  and incubate for 

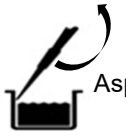
at RT.

5.  Aspirate and wash wells 4 times with **Wash Buffer (1X).**

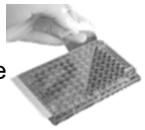
6.  Pipette **100 ul Biotinylated IgD Antibody** into the respective wells.

7. Cover plate  and incubate for 

at RT.

8.  Aspirate and wash wells 4 times with **Wash Buffer (1X).**

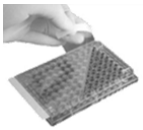
9.  Pipette **Streptavidin:HRP Conjugate solution** into each well.

10. Cover plate  and incubate for 

at RT.

11.  Aspirate and wash wells 4 times with **Wash Buffer (1X).**

12.  Pipette **100 ul TMB Substrate** into each well.

12. Cover plate  and incubate for 

at RT.

13.  Pipette **100 ul Stop Solution** into each well.

14. Read absorbance at 450nm with a  microplate reader within 

of stopping reaction.

Typical Example of a Work List

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

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SYMBOLS KEY

MTP	Anti-Human IgD Antibody Coated Microtiter Plate (12x8 wells)
STD	Human IgD Standard
BIOTIN AB	Biotinylated Antibody
1X SAMP DIL	(1X) Sample Diluent
1X STD DIL	(1X) Standard Diluent
STRP HRP DIL	Streptavidin–HRP diluent
STRP HRP	Streptavidin – HRP
20X WASH BUF	(20X) Wash Buffer
SUB TMB	TMB Substrate
SOLN STOP	Stop Solution
	Consult Instructions for Use
REF	Catalog Number
	Expiration Date
	Storage Temperature