

LSBio
an Absolute Biotech Company

Horse ALB / Serum Albumin ELISA Kit (Competitive EIA)

User Manual

Catalog No. LS-F10158

It is important that you read this entire manual carefully before starting your experiment.

SAMPLE ONLY

This kit is for Research Use Only. Not for Diagnostic Use.
This kit is not approved for use in humans or for clinical diagnosis.

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ASSAY SPECIFICATIONS

Target:	ALB / Serum Albumin
Synonyms:	ALB, Albumin (32 AA), Albumin (AA 34), Growth-inhibiting protein, PRO1341, PRO0883, Serum albumin, PRO0903
Specificity:	This assay has high sensitivity and excellent specificity for detection of horse albumin. No significant cross-reactivity or interference between horse albumin and analogs was observed. Note: Limited by current skills and knowledge, it is impossible for us to complete the cross-reactivity detection between horse albumin and all the analogs, therefore, cross reaction may still exist.
Sample Types:	This kit is recommended for use with horse serum and plasma. No other sample types are supported.
Detection:	Colorimetric - 450nm
Measurement:	Quantitative
Detection Range:	1.25 - 80 μg/ml
Sensitivity:	Typically less than 1.247 μg/ml
Performance:	Intra-Assay CV=8%; Inter-Assay CV=10%
Limitations:	This kit is for **Research Use Only** and is not intended for diagnostic use. This kit is not approved for use in humans or for clinical diagnosis.

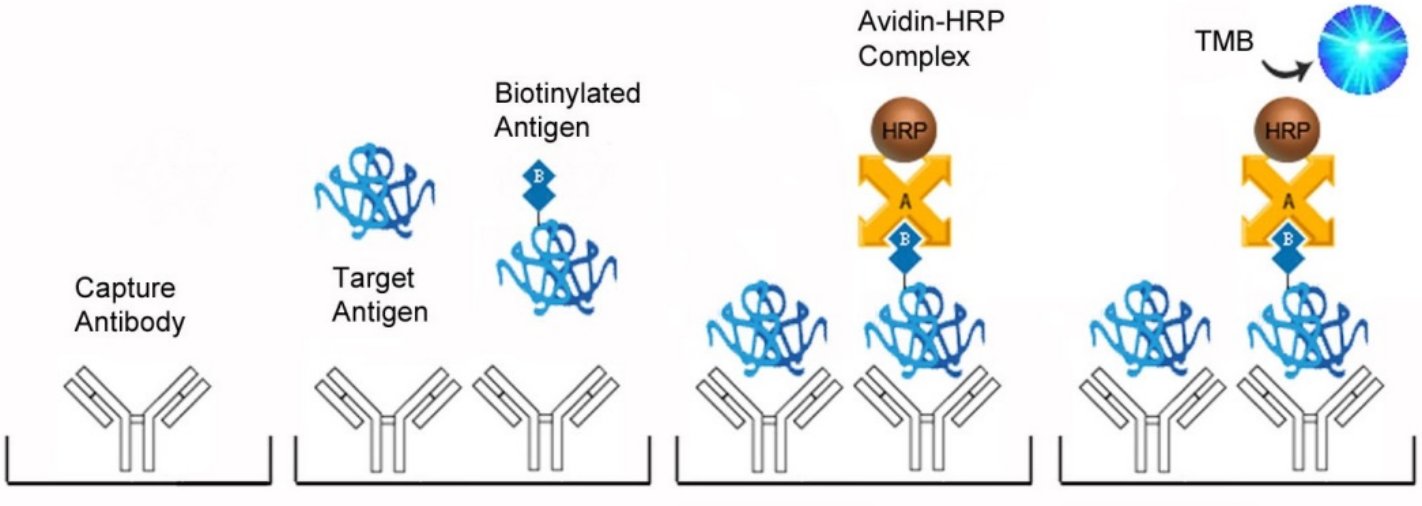
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ASSAY PRINCIPLE

This assay is based on the competition ELISA principle. Each well of the supplied microtiter plate has been pre-coated with a target specific capture antibody. Standards or samples are added to the wells as well as a fixed quantity of Horseradish Peroxidase (HRP)-conjugated detection antibody. The free antigens (in the standards or samples) and antigens bound to the plate compete to bind to the detection antibody. All but the bound HRP-conjugated detection antibody is washed away. A TMB substrate is then added which reacts with the HRP enzyme resulting in color development. A sulfuric acid stop solution is added to terminate color development reaction and then the optical density (OD) of the well is measured at a wavelength of 450 nm ± 2 nm. The OD of an unknown sample can then be compared to an OD standard curve generated using known antigen concentrations in order to determine its antigen concentration. In contrast to typical Sandwich ELISA assays, in competition assay the greater the amount of antigen in the sample, the lower the color development and optical density reading.

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ASSAY PRINCIPLE IMAGE



KIT COMPONENTS

Component	Quantity
Coated 96-well Strip Plate	1
Standard (Lyophilized)	2 vials
Sample Diluent	2 vial x 20 ml
Biotinylated Standard (100x)	1 vial x 60 µl
Biotinylated Standard Diluent	1 vial x 10 ml
HRP-Conjugate (100x)	1 vial x 120 µl
HRP-Conjugate Diluent	1 vial x 20 ml
Wash Buffer (25x)	1 vial x 20 ml
TMB Substrate	1 vial x 10 ml
Stop Solution	1 vial x 10 ml
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KIT STORAGE

The unopened kit can be stored at 2-8°C through the expiration date. Once opened, all kit components can be stored at 2-8°C of up to 1 month. For long term storage the Standard and HRP-Conjugate should be stored at -20°C. TMB Substrate should always be stored at 4°C. Unused strips should be kept in a sealed bag with the desiccant provided to minimize exposure to damp air.

OTHER REQUIRED SUPPLIES

- Microplate reader with 450nm wavelength filter with the correction wavelength set at 540nm or 570nm.
- High-precision pipette and sterile pipette tips
- Eppendorf tubes
- 37°C incubator
- Deionized or distilled water
- Absorbent paper

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EXPERIMENTAL LAYOUT

The following is an example of how to layout a study. A dilution series of the positive control Standard should be run in duplicate or triplicate, with the last well in each series being the negative control blank. Samples should also be run in duplicate or triplicate. Unknown samples should be run as a dilution series in order to identify the optimal dilution that produces an OD reading within the OD range of the positive control Standard dilution series.

Example 1: Standard Curve and dilution series of an unknown sample.

	1	2	3	4	...
A	Standard Dilution 1	Standard Dilution 1	Sample (1:1)	Sample (1:1)	...
B	Standard Dilution 2	Standard Dilution 2	Sample (1:10)	Sample (1:10)	...
C	Standard Dilution 3	Standard Dilution 3	Sample (1:100)	Sample (1:100)	...
D	Standard Dilution 4	Standard Dilution 4	Sample (1:1k)	Sample (1:1k)	...
E	Standard Dilution 5	Standard Dilution 5	Sample (1:10k)	Sample (1:10k)	...
F	Zero Standard	Zero Standard	Sample (1:100k)	Sample (1:100k)	...
G	Zero Standard	Zero Standard	Sample (1:1,000k)	Sample (1:1,000k)	...
H	Zero Standard	Zero Standard	Sample (1:10,000k)	Sample (1:10,000k)	...

Example 2: Standard Curve and samples run in duplicate.

	1	2	3	4	...
A	Standard Dilution 1	Standard Dilution 1	Sample A	Sample E	...
B	Standard Dilution 2	Standard Dilution 2	Sample A	Sample E	...
C	Standard Dilution 3	Standard Dilution 3	Sample B	Sample F	...
D	Standard Dilution 4	Standard Dilution 4	Sample B	Sample F	...
E	Standard Dilution 5	Standard Dilution 5	Sample C	Sample G	...
F	Zero Standard	Zero Standard	Sample C	Sample G	...
G	Zero Standard	Zero Standard	Sample D	Sample H	...
H	Zero Standard	Zero Standard	Sample D	Sample H	...

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SAMPLE COLLECTION

This assay is recommended for use with serum and plasma. Use with other sample types is not supported. The sample collection protocols below have been provided for your reference.

Breast Milk - Centrifuge samples for 20 minutes at 1000×g to remove particulates. Collect the supernatant for assaying. Breast milk often requires a dilution of about 1:500 with PBS*.

Cell Lysates - Collect and pellet the cells by centrifugation and remove the supernatant. Wash the cells 3 times with PBS*then resuspend in PBS*. Lyse the cells by ultrasonication 4 times. Alternatively freeze the cells freeze to -20°C and thaw to room temperature 3 times. Centrifuge at 1500×g for 10 minutes at 2 - 8°C to remove cellular debris. Collect the supernatant for assaying.

Erythrocyte Lysates - Centrifuge whole blood for 20 minutes at 1000×g to pellet the cells and remove the supernatant. Wash the cells 3 times with PBS*then resuspend in PBS*. Freeze (-20°C)/thaw (room temperature) the cells 3 times. Centrifuge at 5,000×g for 10 minutes at 2-8°C to remove cellular debris. Collect the supernatant for assaying. Erythrocyte lysates must be diluted with Sample Dilute before running.

Plasma - Collect plasma using EDTA or heparin as an anticoagulant. Centrifuge samples for 15 minutes at 1000×g at 2–8°C within 30 minutes of collection. Collect the supernatant for assaying.

Platelet-Poor Plasma - Collect plasma using EDTA as an anticoagulant. Centrifuge samples for 15 minutes at 1000×g at 2–8°C within 30 minutes of collection. It is recommended to centrifuge samples for 10 minutes at 10,000×g for complete platelet removal. Collect the supernatant for assaying.

Sperm and Seminal Plasma – Allow semen to liquefy at room temperature or 37°C. After liquefaction, centrifuge at 2,000×g for 10-15 minutes. Collect seminal plasma supernatant for assaying. Wash the precipitated protein 3 times with PBS* then resuspend in PBS*. Lyse the cells by ultrasonication then centrifuge at 2,000×g for 10-15 minutes. Collect the supernatant for assaying.

Serum - Use a serum separator tube and allow samples to clot for 2 hours at room temperature or overnight at 4°C before centrifugation for

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20 minutes at approximately 1000×g. Collect the supernatant for assaying.

Tissue Homogenates – Because preparation methods for tissue homogenates vary depending upon tissue type, users should research tissue specific conditions independently. The following is one example only. Rinse tissues in PBS* to remove excess blood and weighed before homogenization. Finely minced 100mg of tissues and homogenized them in 1 mL of PBS*with a glass homogenizer on ice. Lyse the cells by ultrasonication or freeze (-20°C)/thaw (room temperature) 3 times. Centrifuge homogenate at 5,000 × g for 5 minutes. Collect the supernatant for assaying.

Urine - Aseptically collect the first urine of the day (mid-stream), voided directly into a sterile container. Centrifuge to remove particulate matter.

Cell culture supernatants, cerebrospinal, follicular, and lung lavage fluids, saliva, sweat, tears, and other biological fluids - Centrifuge samples for 20 minutes at 1000×g to remove particulates. Collect the supernatant for assaying.

* 1xPBS (0.02mol/L pH7.0-7.2)

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SAMPLE COLLECTION NOTES

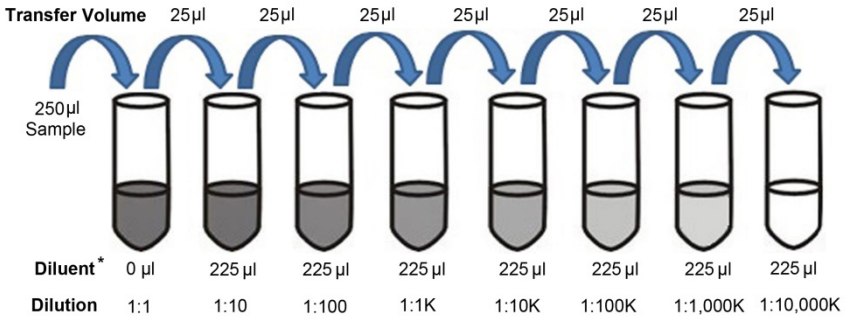
1. LSBio recommends that samples are used immediately upon preparation. Alternatively samples stored at 2-8°C should be used within 5 days. For long-term storage sample aliquots should be prepared and stored at -20°C if used within 1 month, or -80°C if used within 6 months. Long term storage can result in protein degradation and denaturalization, which may result in inaccurate results.
2. Avoid repeated freeze/thaw cycles for all samples.
3. In the event that a sample type not listed above is intended to be used with the kit, it is recommended that the customer conduct validation experiments in order to be confident in the results.
4. Due to chemical interference, the use of tissue or cell extraction samples prepared by chemical lysis buffers may result in inaccurate results.
5. Influenced by the factors including cell viability, cell number or sampling time, samples from cell culture supernatant may not be detected by the kit.
6. Samples should be brought to room temperature (18-25°C) before performing the assay without the use of extra heating.
7. Sample concentrations should be predicted before being used in the assaying. If the sample concentration is not within the range of the standard curve, users must determine the optimal sample dilutions for their particular experiments.
8. LSBio is responsible for the quality and performance of the kit components but is NOT responsible for the performance of customer supplied samples use with the kit.

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SAMPLE PREPARATION

The resulting Optical Density (OD) values of your sample must fall within the OD values of the standard curve in order for the calculated antigen concentration to be accurate. In many cases samples will need to be diluted in order to lower the antigen concentration to sufficient levels. Information about antigen concentrations within various sample types may be available from the published literature; however, it is often necessary to run a dilution series of each sample type. The following will prepare sufficient volumes to run the Sample dilution series in triplicate. In the case of small volume samples, a preliminary step dilution, such as 1:5 or 1:10, can be made using PBS (0.02mol/L pH7.0-7.2) as the diluent.

*** The final dilution should always be made using the same buffer that is used to dilute the Standards, and/or generate the Standard Curve.** Running duplicate or triplicate wells for each sample is recommended.



Special Cases

Serum and plasma typically require a **5,000-fold** dilution with Sample Diluent in order for their OD readings to fall within the Standard Curve of this assay. However, due to sample variation, it is recommended that researchers determine the optimal dilution for their samples as described above.

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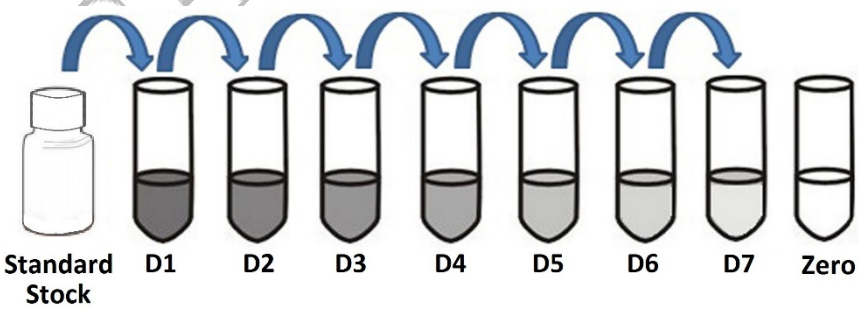
STANDARD PREPARATION

The following are instructions for the preparation of a Standard dilution series which will be used to generate the standard curve. The standard curve is then used to determine the concentration of target antigen in unknown samples (see the **Calculation of Results** section). The following will prepare sufficient volumes to run the Standard dilution series in duplicate. Reconstituted Standard and prepared standard dilutions should be used immediately and not stored for future use.

Standard Stock Solution (80 µg/ml): Centrifuge the Standard at 6,000-10,000 rpm for 30 seconds before opening. Reconstitute 1 vial of Standard supplied with the kit with 1ml of Sample Diluent. Agitate gently at room temperature for 15 minutes prior to use.

D1 (80 µg/ml):	Pipette 300µl of Stock Standard into 0µl of Sample Diluent
D2 (40 µg/ml):	Pipette 150µl of D1 into 150µl of Sample Diluent
D3 (20 µg/ml):	Pipette 150µl of D2 into 150µl of Sample Diluent
D4 (10 µg/ml):	Pipette 150µl of D3 into 150µl of Sample Diluent
D5 (5 µg/ml):	Pipette 150µl of D4 into 150µl of Sample Diluent
D6 (2.5 µg/ml):	Pipette 150µl of D5 into 150µl of Sample Diluent
D7 (1.25 µg/ml):	Pipette 150µl of D6 into 150µl of Sample Diluent

Zero Standard (0 µg/ml): Use Sample Diluent alone



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REAGENT PREPARATION

Bring all reagents to room temperature (18-25°C) before use.

1x Biotinylated Standard: Centrifuge the supplied vial of 100x Biotinylated Standard before opening. Prepare 1 ml of 1x Biotinylated Standard solution by diluting 10 µl of 100x Biotinylated Standard with 990 µl of Biotinylated Standard Diluent.

1x HRP-Conjugate: Centrifuge the supplied vial of 100x HRP-Conjugate before opening. Prepare 1 ml of 1x HRP-Conjugate by diluting 10 µl of 100x HRP-Conjugate with 990 µl of HRP-Conjugate Diluent.

1x Wash Buffer: If crystals have formed in the concentrate, warm to room temperature and mix it gently until crystals have completely dissolved. Prepare 500 ml of Working Wash Buffer by diluting the supplied 20 ml of 25x Wash Buffer Concentrate with 480 ml of deionized or distilled water. Wash Buffer can be stored at 4°C once prepared.

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REAGENT PREPARATION NOTES

1. It is highly recommended that standard curves and samples are run in duplicate within each experiment.
2. Once resuspended, standards should be used immediately, and used only once. Long-term storage of reconstituted standards is NOT recommended.
3. All solutions prepared from concentrates are intended for one-time use. Do not reuse solutions.
4. Do not prepare Standard dilutions directly in wells.
5. Prepared Reagents may adhere to the tube wall or cap during transport; centrifuge tubes briefly before opening.
6. All solutions should be gently mixed prior to use.
7. Reconstitute stock reagents in strict accordance with the instructions provided.
8. To minimize imprecision caused by pipetting, ensure that pipettes are calibrated. Pipetting volumes of less than 10µL is not recommended.
9. TMB Substrate is easily contaminated; sterility precautions should be taken. Substrate Solution should also be protected from light.
10. Do not substitute reagents from one kit lot to another. Use only those reagents supplied within this kit.
11. Due to the antigen specificity of the antibodies used in this assay, native or recombinant proteins from other manufacturers may not be detected by this kit.

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ASSAY PROCEDURE

Bring all reagents and samples to room temperature without additional heating and mixed thoroughly by gently swirling before pipetting (avoid foaming). Prepare all reagents, working standards and samples as directed in the previous sections.

1. Set a blank well without any solution.
2. Add 50 µl of **Standard** or **Sample** per well. Standards need to be run in duplicate.
3. Immediately add 50 µl of **1x Biotinylated Standard** to each well (not to the Blank well), cover with a plate sealer, gently agitate to ensure thorough mixing, and incubate for 60 minutes at 37°C.
4. Aspirate the liquid from each well and wash 3 times. Wash by adding approximately 200 µl of **Wash Buffer** using a squirt bottle, multi-channel pipette, manifold dispenser or automated washer. Allow each wash to sit for 2 minutes before completely aspirating. After the last wash, aspirating remove any remaining Wash Buffer then invert the plate and tap against clean absorbent paper.
5. Add 100 µl of **1x HRP-Conjugate** to each well (not to Blank well), gently agitate to ensure thorough mixing, cover with a plate sealer, and incubate for 60 minutes at 37°C.
6. Aspirate the liquid from each well and wash 5 times as outlined in step 4.
7. Add 90 µl of **TMB Substrate** to each well, cover with a new plate sealer, and incubate for 20 minutes at 37°C. Protect from light and monitor periodically until optimal color development has been achieved.
8. Add 50 µl of **Stop Solution** to each well. The blue color will change to yellow immediately. If color change does not appear uniform, gently tap the plate to ensure thorough mixing. The Stop Solution should be added to wells in the same order and timing as was the substrate solution.

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9. Determine the optical density (OD value) of each well immediately using a microplate reader set to 450nm with the correction wavelength set at 540nm or 570nm if available. Subtract the 540nm or 570nm reading from the 450nm reading to account for imperfections in the plate.

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ASSAY PROCEDURE NOTES

1. **ELISA Plate**: Keep appropriate numbers of strips for 1 experiment and remove extra strips from microtiter plate. Removed strips should be placed in a sealed bag containing desiccant and stored at 4°C.
2. **Solutions:** To avoid cross-contamination, change pipette tips between additions of each standard, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.
3. **Applying Solutions:** All solutions should be added to the bottom of the ELISA plate well. Avoid touching the inside wall of the well. Avoid foaming when possible.
4. **Assay Timing**: The interval between adding sample to the first and last wells should be minimized. Delays will increase the incubation time differential between wells, which will significantly affect the experimental accuracy and repeatability. For each step in the procedure, total dispensing time for addition of reagents or samples should not exceed 10 minutes.
5. **Incubation**: To prevent evaporation and ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary. Do not allow wells to sit uncovered for extended periods of time between incubation steps. Do not let wells dry out at any time during the assay. Strictly observe the recommended incubation times and temperatures.
6. **Washing**: Proper washing procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings. Residual liquid in the reaction wells should be patted dry against absorbent paper during the washing process. Do not put absorbent paper directly into the reaction wells.
7. **Controlling Substrate Reaction Time**: After the addition of the TMB Substrate, periodically monitor the color development. Stop color development before the color becomes too deep by adding Stop Solution. Excessively strong color will result in inaccurate absorbance reading.

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8. **Reading**: The microplate reader should be preheated and programmed prior to use. Prior to taking OD readings, remove any residual liquid or fingerprints from the underside of the plate and confirm that there are no bubbles in the wells.
9. **Reaction Time Control**: Control reaction time should be strictly followed as outlined.
10. **Stop Solution**: The Stop Solution contains an acid, therefore proper precautions should be taken during its use, such as protection of the eyes, hands, face, and clothing.
11. **Mixing**: During incubation times, the use of a micro-oscillator at low frequency is recommended. Sufficient and gentle mixing is particularly important in producing reliable results.
12. Kits from different batches may be a little different in detection range, sensitivity, and color developing time. Please perform the experiment exactly according to the supplied instructions.
13. Due to inter- and intra-assay variability, it is recommended that appropriate carry-over controls be included between assays.
14. Prior to running valuable samples, LSBio recommends that the user run a preliminary experiment using the supplied controls in order to validate the assay.
15. To minimize external influence on the assay performance, operational procedures and lab conditions (such as room temperature, humidity, incubator temperature) should be strictly controlled. It is also strongly suggested that the whole assay is performed by the same operator from the beginning to the end.
16. The kit should not be used beyond the expiration date on the kit label.

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ASSAY PROCEDURE SUMMARY

Prepare all reagents, samples and standards.

Set a Blank well without any solution.

Add 50 µl of **Sample or Standard** to each well.

Add 50 µl of **1x Biotinylated Standard** to each well (not to the blank well) and incubate for 60 minutes at 37°C.

Aspirate and wash 3 times.

Add 100 µl of **1x HRP-Conjugate** to each well (not to the blank well) and incubate for 60 minutes at 37°C.

Aspirate and wash 5 times.

Add 90 µl of **TMB Substrate** to each well and incubate in the dark for 20 minutes at 37°C.

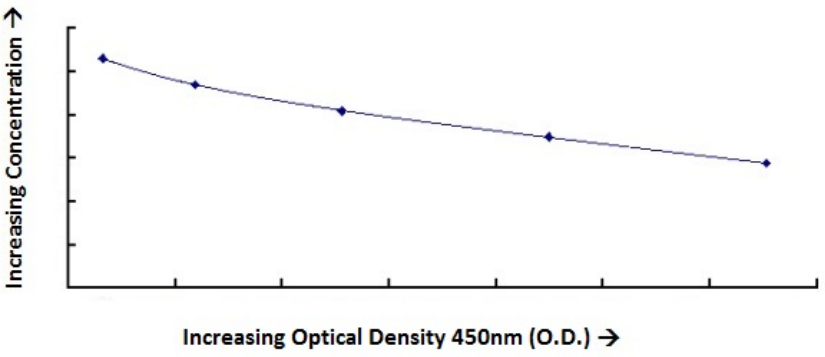
Add 50 µl of **Stop Solution**.

Read within 5 minutes at 450nm.

CALCULATION OF RESULTS

Average the duplicate readings for each standard, control, and sample. Create a standard curve by plotting the mean absorbance for each standard on the X-axis against the target antigen concentration on the Y-axis and draw a best fit curve through the points on the graph. The data may be linearized by plotting the log of the target antigen concentration on the Y-axis versus the O.D. of the standards on the X-axis and the best fit line can be determined by regression analysis. The linear equation (Y = mx + b) can be used to calculate the standard curve where Y is the log of the concentration of the standard and x is the O.D. value of the standard. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

Typical Data: The following standard curve is an example only and should not be used to calculate results for tested samples. A new standard curve must be generated for each set of samples tested.



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TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
Poor standard curve	Inaccurate pipetting	Check pipettes
	Improper standard dilution	Briefly spin the vial of standard and dissolve the powder thoroughly by a gentle mix.
	Wells not completely aspirated	Completely aspirate wells between steps.
Low signal	Too brief incubation times	Ensure sufficient incubation time.
	Incorrect assay temperature	Use recommended incubation temperature. Bring substrate to room temperature before use.
	Inadequate reagent volumes	Check pipettes and ensure correct preparation.
	Improper dilution	
Deep color but low value	Plate reader settings not optimal	Verify the wavelength and filter setting in the plate reader.
		Open the Plate Reader ahead to pre-heat.

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Troubleshooting Guide (continued)

Problem	Possible Cause	Solution
Large CV	Inaccurate pipetting	Check pipettes.
High background	Concentration of detector too high	Use recommended dilution factor.
	Plate is insufficiently washed	Review the manual for proper washing instructions. If using a plate washer, check that all ports are unobstructed.
	Contaminated wash buffer	Make fresh wash buffer.
Low sensitivity	Improper storage of the ELISA kit	All the reagents should be stored according to the instructions.
	Stop solution not added	Stop solution should be added to each well before measurement.

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Important Note: During shipment, small volumes of product will occasionally become entrapped in the seal of the product vial. We recommend briefly centrifuging the vial to dislodge any liquid in the container's cap prior to opening.

Warning: This reagent may contain sodium azide and sulfuric acid. The chemical, physical, and toxicological properties of these materials have not been thoroughly investigated. Standard Laboratory Practices should be followed. Avoid skin and eye contact, inhalation, and ingestion. Sodium azide forms hydrazoic acid under acidic conditions and may react with lead or copper plumbing to form highly explosive metal azides. On disposal, flush with large volumes of water to prevent accumulation.

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