



# KLH IgM (Mouse) ELISA Kit

Catalog Number KA2461

96 assays

Version: 13

Intended for research use only

[www.abnova.com](http://www.abnova.com)

## Table of Contents

<b>Introduction .....</b>	<b>3</b>
Intended Use.....	3
Principle of the Assay .....	3
<b>General Information .....</b>	<b>4</b>
Materials Supplied.....	4
Storage Instruction.....	4
Materials Required but Not Supplied .....	4
Precautions for Use .....	5
<b>Assay Protocol .....</b>	<b>6</b>
Reagent Preparation.....	6
Sample Preparation .....	6
Assay Procedure .....	6
<b>Data Analysis.....</b>	<b>8</b>
Calculation of Results.....	8
<b>Resources.....</b>	<b>9</b>
Reference .....	9
Plate Layout .....	10

## **Introduction**

### **Intended Use**

Measurement of KLH (keyhole limpet hemocyanin) induced anti-KLH antibody levels allows quantitative evaluation of the immune response (ref 1). This ELISA is designed for the rapid and quantitative measurement of mouse anti-KLH IgM levels in mouse serum or plasma. A companion ELISA, catalog number KA2461, can be used for measurement of mouse anti-KLH IgG.

### **Principle of the Assay**

The KLH IgM (Mouse) ELISA Kit is based on a solid phase enzyme-linked immunosorbent assay (ELISA). The assay uses KLH for solid phase (microtiter wells) immobilization and horseradish peroxidase (HRP) conjugated anti-mouse IgM antibodies for detection. Test serum or plasma samples are diluted and incubated in the microtiter wells for 1 hour. The microtiter wells are subsequently washed, and HRP conjugate is added and incubated for 45 minutes. Anti-KLH IgM molecules are thus sandwiched between immobilized KLH and the detection antibody conjugate. The wells are then washed to remove unbound HRP-labeled antibodies, and TMB Reagent is added and incubated for 20 minutes at room temperature. This results in the development of a blue color. Color development is stopped by the addition of Stop Solution; changing the color to yellow. Optical density is measured spectrophotometrically at 450 nm. The concentration of anti-KLH IgM is proportional to the optical density of the test sample.

## General Information

### Materials Supplied

List of component

Component	Amount
KLH coated 96-well plate	96 wells (provided as 12 strips of 8 wells)
Enzyme Conjugate Reagent	11 mL
Reference standard <sup>1</sup>	Lyophilized
20x Wash Solution	50 mL
Diluent	60 mL
TMB Reagent (One-step)	11 mL
Stop Solution (1 N HCl)	11 mL

<sup>1</sup> Mouse anti-KLH IgM levels are measured in nominal units and are calibrated with reference anti-KLH mouse serum.

### Storage Instruction

- ✓ The reference standard should be stored at -20°C for optimal stability.
- ✓ All remaining kit components should be stored at 4°C.

The microtiter plate should be kept in a sealed bag with desiccant to minimize exposure to damp air. Test kit will remain stable for six months from the date of purchase provided that the components are stored as described above.

### Materials Required but Not Supplied

- ✓ Precision pipettes and tips
- ✓ Distilled or deionized water
- ✓ Polypropylene or glass tubes
- ✓ Vortex mixer
- ✓ Absorbent paper or paper towels
- ✓ Micro-plate incubator/shaker mixing speed of 150 rpm
- ✓ Plate washer
- ✓ Plate reader with an optical density range of 0-4 at 450 nm
- ✓ Graph paper (PC graphing software is optional)

### **Precautions for Use**

- ✓ For Research Use Only, Not for Diagnostic Purposes.
- ✓ Please read and understand the instructions thoroughly before using the kit.
- ✓ This kit is designed to measure anti-KLH IgM levels in serum collected 5 days after immunization with KLH. Serum collected at post-immunization times greater than 5 days may contain high levels of anti-KLH IgG that compete with anti-KLH IgM for the immobilized KLH, thereby causing interference.
- ✓ All reagents should be allowed to reach room temperature (25°C) before use.
- ✓ The optimal sample dilution should be determined empirically. However, we suggest an initial sample dilution of 500-fold. Please do not use dilutions less than 25-fold.
- ✓ Optimum results are achieved if, at each step, reagents are pipetted into the wells of the microtiter plate within 5 minutes.
  
- ✓ Limitations of the procedure
  - Reliable and reproducible results will be obtained when the assay procedure is carried out with a complete understanding of and in accordance with the instructions detailed above.
  - The wash procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings.

## Assay Protocol

### Reagent Preparation

- ✓ Wash Solution Preparation  
The wash solution is provided as a 20x stock. Prior to use, dilute the contents of the bottle (50 mL) with 950 mL of distilled or deionized water.
- ✓ Standard Preparation
  1. The mouse anti-KLH IgM standard is provided as a lyophilized stock. Reconstitute the stock as described on the vial label.
  2. Label 5 polypropylene or glass tubes as 100, 50, 25, 12.5 and 6.25 u/mL.
  3. In the tube labeled 100 u/mL prepare the 100 u/mL standard as detailed on the stock vial label.
  4. Dispense 250  $\mu$ L of diluent into the remaining tubes.
  5. Prepare a 50 u/mL standard by diluting and mixing 250  $\mu$ L of the 100 u/mL standard with 250  $\mu$ L of diluent in the tube labeled 50 u/mL.
  6. Similarly prepare the 25, 12.5, and 6.25 u/mL standards by serial dilution.

### Sample Preparation

*General Note: Anti-KLH IgM is present in serum from KLH immunized mice at concentrations of approximately 10,000 u/mL. To obtain values within range of the standard curve, we suggest that samples initially be diluted 500-fold using the following procedure for each sample to be tested:*

1. Dispense 48  $\mu$ L and 237.5  $\mu$ L of diluent into separate tubes.
2. Pipette and mix 2  $\mu$ L of the serum/plasma sample into the tube containing 48  $\mu$ L of diluent. This provides a 25-fold diluted sample.
3. Mix 12.5  $\mu$ L of the 25-fold diluted sample with the 237.5  $\mu$ L of diluent in the second tube. This provides a 500-fold dilution of the sample.
4. Repeat this procedure for each sample to be tested

### Assay Procedure

1. Secure the desired number of coated wells in the holder.
2. Dispense 100  $\mu$ L of standards and diluted samples into the wells (we recommend that samples be tested in duplicate).
3. Incubate on an orbital micro-plate shaker at 100-150 rpm at room temperature (25°C) for 1 hour.
4. Aspirate the contents of the microtiter wells and wash the wells 5 times with 1x wash solution using a plate washer (400  $\mu$ L/well). The entire wash procedure should be performed as quickly as possible.
5. Strike the wells sharply onto absorbent paper or paper towels to remove all residual wash buffer.
6. Add 100  $\mu$ L of enzyme conjugate reagent into each well.

7. Incubate on an orbital micro-plate shaker at 100-150 rpm at room temperature (25°C) for 45 minutes.
8. Wash as detailed in 4 to 5 above.
9. Dispense 100  $\mu$ L of TMB Reagent into each well.
10. Gently mix on an orbital micro-plate shaker at 100-150 rpm at room temperature (25°C) for 20 minutes.
11. Stop the reaction by adding 100  $\mu$ L of Stop Solution to each well.
12. Gently mix. It is important to make sure that all the blue color changes to yellow.
13. Read the optical density at 450 nm with a microtiter plate reader within 5 minutes.

## Data Analysis

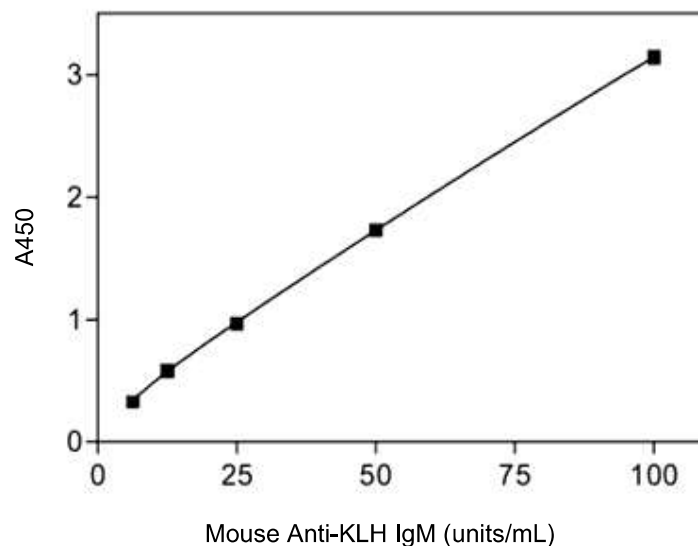
### Calculation of Results

1. Calculate the average absorbance value ( $A_{450}$ ) for each set of reference standards and samples.
2. Construct a standard curve by plotting the mean absorbance obtained from each reference standard against its concentration in ng/mL on linear graph paper, with absorbance values on the vertical or Y-axis and concentrations on the horizontal or X-axis.
3. Using the mean absorbance value for each sample, determine the corresponding concentration of anti-KLH IgM in u/mL from the standard curve.
4. Multiply the derived concentrations by the dilution factor to determine the actual concentration of anti-KLH IgM in the serum/plasma sample.
5. PC graphing software may be used for the above steps.
6. If the  $OD_{450}$  values of samples fall outside the standard curve when tested at a dilution of 500, samples should be diluted appropriately and re-tested.

#### ✓ Typical Standard Curve

A typical standard curve with optical density readings at 450 nm on the Y axis against anti-KLH IgM concentrations on the X axis is shown below. This curve is for the purpose of illustration only and should not be used to calculate unknowns.

Anti-KLH IgM (u/mL)	Absorbance (450 nm)
100	3.145
50	1.730
25	0.971
12.5	0.581
6.25	0.330



## **Resources**

### **Reference**

1. Wada H, Noguchi Y, Marino MW, Dunn AR and Old LJ. T-cell functions in granulocyte/macrophage colony-stimulating factor deficient mice. Proc Natl Acad Sci. 94:12557-61 (1997).

**Plate Layout**

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

