



# Dengue virus IgG ELISA Kit

Catalog Number KA0961

96 assays

Version: 03

Intended for research use only

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

## Table of Contents

<b>Introduction .....</b>	<b>3</b>
Intended Use .....	3
Background .....	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 .....	4
<b>Assay Protocol .....</b>	<b>6</b>
Reagent Preparation .....	6
Sample Preparation .....	6
Assay Procedure .....	6
<b>Data Analysis .....</b>	<b>7</b>
Calculation of Results .....	7
Performance Characteristics .....	7
<b>Resources .....</b>	<b>9</b>
Reference .....	9
Plate Layout .....	10

## **Introduction**

### **Intended Use**

The Dengue virus IgG ELISA Kit is intended for the detection of IgG antibody to Dengue virus in human serum or plasma.

### **Background**

The mosquito-borne dengue viruses (serotype 1-4) cause dengue fever, a severe flu-like illness. The disease is prevalent in Third World tropical regions and spreading to sub-tropical developed countries - including the United States. WHO estimates that 50-80 million cases of dengue fever occur worldwide each year, including a potentially deadly form of the disease called dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Primary infection with dengue virus results in a self-limiting disease characterized by mild to high fever lasting 3 to 7 days, severe headache with pain behind the eyes, muscle and joint pain, rash and vomiting. Secondary infection is the more common form of the disease in many parts of Southeast Asia and South America. This form of the disease is more serious and can result in DHF and DSS. The major clinical symptoms can include high fever, hemorrhagic events, and circulatory failure, and the fatality rate can be as high as 40%. Early diagnosis of DSS is particularly important, as patients may die within 12 to 24 h if appropriate treatment is not administered. Primary dengue virus infection is characterized by elevations in specific IgM antibody levels 3 to 5 days after the onset of symptoms; this generally persists for 30 to 60 days. IgG levels also become elevated after 10 to 14 days and remain detectable for life. During secondary infection, IgM levels generally rise more slowly and reach lower levels than in primary infection, while IgG levels rise rapidly from 1 to 2 days after the onset of symptoms.

### **Principle of the Assay**

Diluted patient serum is added to wells coated with purified Dengue virus antigen. Dengue virus IgG specific antibody, if present, binds to the antigen. All unbound materials are washed away and the enzyme conjugate is added to bind to the antibody-antigen complex, if present. Excess enzyme conjugate is washed off and substrate is added. The plate is incubated to allow the hydrolysis of the substrate by the enzyme. The intensity of the color generated is proportional to the amount of IgG specific antibody in the sample.

## General Information

### Materials Supplied

List of component

Component	Amount
Microwells coated with Dengue antigen	12x8x1
Sample Diluent: 1 bottle (ready to use)	22 ml
Calibrator: yellow Cap. 1 Vial (ready to use)	1 ml
Positive Control: Red Cap. 1 vial (ready to use)	1 ml
Negative Control: Blue Cap. 1 vial (ready to use)	1 ml
Enzyme conjugate: 1 bottle (ready to use)	12 ml
TMB Substrate: 1 bottle (ready to use)	12 ml
Stop Solution: 1 bottle (ready to use)	12 ml
Wash concentrate 20X: 1 bottle	25 ml

### Storage Instruction

- ✓ Store the kit at 2-8 °C.
- ✓ Keep microwells sealed in a dry bag with desiccants.
- ✓ The reagents are stable until expiration of the kit.
- ✓ Do not expose test reagents to heat, sun, or strong light

### Materials Required but Not Supplied

- ✓ Distilled or deionized water
- ✓ Precision pipettes
- ✓ Disposable pipette tips
- ✓ ELISA reader capable of reading absorbance at 450 nm
- ✓ Absorbance paper or paper towel
- ✓ Graph paper

### Precautions for Use

- Precautions
- ✓ Potential biohazardous materials:

The calibrator and controls contain human source components which have been tested and found non-reactive for hepatitis B surface antigen as well as HIV antibody with FDA licensed reagents. However, as there is no test method that can offer complete assurance that HIV, Hepatitis B virus or

other infectious agents are absent, these reagents should be handled at the Biosafety Level 2, as recommended in the Centers for Disease Control/National Institutes of Health manual, "Biosafety in Microbiological and Biomedical Laboratories." 1984.

- ✓ This kit is designed for research use only.
  - ✓ Optimal results will be obtained by strict adherence to the test protocol. Precise pipetting as well as following the exact time and temperature requirements is essential.
  - ✓ Do not pipette by mouth. Do not smoke, eat, or drink in the areas in which specimens or kit reagents are handled.
  - ✓ The components in this kit are intended for use as an integral unit. The components of different lots should not be mixed.
  - ✓ This product contains components preserved with sodium azide. Sodium azide may react with lead and copper plumbing to form explosive metal azide. On disposal, flush with a large volume of water.
- 
- Limitations of the Procedure
  - ✓ The test results obtained using this kit serve only as an aid to diagnosis and should be interpreted in relation to the patient's history, physical findings and other diagnostic procedures.
  - ✓ Lipemic or hemolyzed samples may cause erroneous results.

## **Assay Protocol**

### **Reagent Preparation**

Prepare 1X Wash buffer by adding the contents of the bottle (25 ml, 20X) to 475 ml of distilled or deionized water. Store at room temperature (18-26°C).

### **Sample Preparation**

- ✓ Collect blood specimens and separate the serum.
- ✓ Specimens may be refrigerated at 2–8°C for up to seven days or frozen for up to six months. Avoid repetitive freezing and thawing.

### **Assay Procedure**

Bring all specimens and kit reagents to room temperature (18-26°C) and gently mix.

1. Place the desired number of coated strips into the holder.
2. Negative control, positive control, and calibrator are ready to use. Prepare 1:21 dilution of test samples, by adding 10 µl of the sample to 200 µl of sample diluent. Mix well.
3. Dispense 100 µl of diluted sera, calibrator and controls into the appropriate wells. For the reagent blank, dispense 100 µl sample diluent in 1A well position. Tap the holder to remove air bubbles from the liquid and mix well. Incubate for 20 minutes at room temperature.
4. Remove liquid from all wells. Wash wells three times with 300 µl of 1X wash buffer. Blot on absorbance paper or paper towel.
5. Dispense 100 µl of enzyme conjugate to each well and incubate for 20 minutes at room temperature.
6. Remove enzyme conjugate from all wells. Wash wells three times with 300 µl of 1X wash buffer. Blot on absorbance paper or paper towel.
7. Dispense 100 µl of TMB substrate and incubate for 10 minutes at room temperature.
8. Add 100 µL of stop solution.
9. Read O.D. at 450 nm using ELISA reader within 15 min. A dual wavelength is recommended with reference filter of 600-650 nm.

## Data Analysis

### Calculation of Results

- ✓ Check Calibrator Factor (CF) value on the calibrator bottle. This value might vary from lot to lot. Make sure you check the value on every kit.
- ✓ Calculate the cut-off value: Calibrator OD x Calibrator Factor (CF).
- ✓ Calculate the Ab (Antibody) Index of each determination by dividing the mean value of each sample by cut-off value.
  
- Example of typical results:  
Calibrator mean OD = 0.8  
Calibrator Factor (CF) = 0.5  
Cut-off Value =  $0.8 \times 0.5 = 0.400$   
Positive control O.D. = 1.2  
Ab Index =  $1.2 / 0.4 = 3$   
Patient sample O.D. = 1.6  
Ab Index =  $1.6 / 0.4 = 4.0$
  
- Quality Control  
The test run may be considered valid provided the following criteria are met:
  - ✓ The O.D. of the Calibrator should be greater than 0.250.
  - ✓ The Ab index for Negative control should be less than 0.9.
  - ✓ The Ab Index for Positive control should be greater than 1.2.
  
- Interpretation  
The following is intended as a guide to interpretation of Dengue virus IgG test results; each laboratory is encouraged to establish its own criteria for test interpretation based on sample populations encountered.
  
- Antibody Index Interpretation
  - <0.9 No detectable IgG antibody to Dengue virus.
  - 0.9-1.1 Borderline positive. Follow-up testing is recommended if clinically indicated.
  - >1.1 Detectable IgG antibody to Dengue Virus.

### Performance Characteristics

- Sensitivity and Specificity  
260 patient sera were tested by this Dengue virus ELISA and a reference ELISA method. 190 sera were positivity and 68 were negatives by both methods (99% agreement). The results are summarized below:

		Dengue virus IgG ELISA		
		+	-	Total
Reference ELISA kit	+	190	1	191
kit	-	1	68	69
Total		191	69	260

- Precision

- ✓ Intra Assay Study

Serum	No. of Replicates	Mean	Standard Deviation	Coefficient Variation (%)
1	16	1.98	0.10	5.05
2	16	0.65	0.04	6.15
3	16	0.16	0.01	6.26

- ✓ Inter Assay Study

Serum	No. of Replicates	Mean	Standard Deviation	Coefficient Variation (%)
1	10	2.14	0.22	10.28
2	10	0.54	0.04	07.40
3	10	0.15	0.0	13.33



## Resources

### Reference

1. Pinheiro FP, Corber SJ: Global situation of dengue and dengue haemorrhagic fever, and its emergence in the Americas. *World Health Stat Q* 50(3/4):161-169, 1997.
2. Gubler DJ, Trent DW: Emergence of epidemic dengue/dengue hemorrhagic fever as a public health problem in the Americas. *Infect Agents Dis* 2:383-393, 1993.
3. Wu SJ; Hanson B; Paxton H; Nisalak A; Vaughn DW; Rossi C; Henchal EA; Porter KR; Watts DM; Hayes CG. Evaluation of a dipstick enzyme-linked immunosorbent assay for detection of antibodies to dengue virus. *Clin Diagn Lab Immunol* 1997; 4(4):452-7.
4. Lam SK; Devine PL. Evaluation of capture ELISA and rapid immunochromatographic test for the determination of IgM and IgG antibodies produced during dengue infection. *Clin Diagn Virol* 1998;10(1):75-8.
5. Rossi CA; Drabick JJ; Gambel JM; Sun W; Lewis TE; Henchal EA. Laboratory diagnosis of acute dengue fever during the United Nations Mission in Haiti, 1995-1996. *Am J Trop Med Hyg* 1998;59(2):275-8.

**Plate Layout**

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