ab108752

Mumps Virus IgG
Human ELISA Kit

Instructions for Use

For the qualitative determination of IgG class antibodies against Mumps Virus in Human serum or plasma (citrate)

This product is for research use only and is not intended for diagnostic use.
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1. Introduction

ab108752 Mumps Virus IgG Human ELISA Kit is intended for the qualitative determination of IgG class antibodies to Mumps Virus in human serum or plasma (citrate).

Mumps viruses are RNA viruses of the family Paramyxoviridae. The virions are spherical particles of 150-250 nm in diameter consisting of a ribonucleoprotein with helical symmetry and enveloped by matrix protein and a lipid bilayer which contains two spike-like structures: viral hemagglutinin (H) and viral neuraminidase (N). Mumps virus involves primarily the parotid and related salivary glands; however infection can lead to CNS disease and accumulation of the virus in CSF. Mumps (Epidemic Parotitis) is an acute contagious viral disease mostly occurring in children. Nearly 50% of all infections are subclinical. The highest incidence of clinical manifestations is found in the age group of 4 to 15 years. Secondary infections are rare because of long-lasting immunity. 10 to 35 % of mumps cases develop orchitis which occurs nearly always after puberty. The process is mostly unilateral and the prognosis usually good. Mumps virus has been one of the most important causes of viral CNS disease (meningitis and encephalitis) in USA; vaccine administration has greatly reduced its incidence.
2. Assay Summary

*ab108752 is for the qualitative immunoenzymatic determination of IgG-class antibodies against Mumps Virus and is based on the ELISA (Enzyme-linked Immunosorbent Assay) technique.*

Microtiter strip wells are precoated with Mumps Virus antigens to bind corresponding antibodies of the specimen. Incubated for 1 hour.

After washing the wells to remove all unbound sample material horseradish peroxidase (HRP) labeled anti-human IgG conjugate is added. Incubated for 30 minutes. This conjugate binds to the captured Mumps Virus-specific antibodies.

The immune complex formed by the bound conjugate is visualized by adding Tetramethylbenzidine (TMB) substrate which gives a blue reaction product. Incubated for 15 minutes. The intensity of this product is proportional to the amount of Mumps Virus-specific IgG antibodies in the specimen.

Sulphuric acid is added to stop the reaction. This produces a yellow endpoint color. Absorption at 450 nm is read using an ELISA microwell plate reader.
3. Kit Contents

- **Mumps Virus Coated Wells (IgG):** 12 break apart 8-well snap-off strips coated with Mumps Virus antigen; in resealable aluminium foil.
- **IgG Sample Diluent ***:** 1 bottle containing 100 ml of buffer for sample dilution; pH 7.2 ± 0.2; colored yellow; ready to use; white cap.
- **Stop Solution:** 1 bottle containing 15 ml sulphuric acid, 0.2 mol/l; ready to use; red cap.
- **Washing Solution (20x conc.)*:** 1 bottle containing 50 ml of a 20-fold concentrated buffer (pH 7.2 ± 0.2) for washing the wells; white cap.
- **Mumps Virus anti-IgG Conjugate**: 1 bottle containing 20 ml of peroxidase labeled rabbit antibody to human IgG; colored blue, ready to use; black cap.
- **TMB Substrate Solution:** 1 bottle containing 15 ml 3,3',5,5'-tetramethylbenzidine (TMB); ready to use; yellow cap.
- **Mumps Virus IgG Positive Control***:** 1 bottle containing 2 ml; colored yellow; ready to use; red cap.
- **Mumps Virus IgG Cut-off Control***:** 1 bottle containing 3 ml; colored yellow; ready to use; green cap.
- **Mumps Virus IgG Negative Control***:** 1 bottle containing 2 ml; colored yellow; ready to use; blue cap.
- **Strip holder:** 1
• **Cover foil**: 1
  
  * contains 0.1 % Bronidox L after dilution
  ** contains 0.2 % Bronidox L
  *** contains 0.1 % Kathon

4. **Storage and Handling**

The reagents are stable up to the expiry date stated on the label when stored at 2-8 °C.

5. **Additional Materials Required**

• ELISA microwell plate reader, equipped for the measurement of absorbance at 450/620 nm
• Incubator 37 °C
• Manual or automatic equipment for rinsing wells
• Pipettes to deliver volumes between 10 and 1000 µl
• Vortex tube mixer
• Deionised or (freshly) distilled water
• Disposable tubes
• Timer
6. Preparation of Reagents

It is very important to bring all reagents, samples and standards to room temperature (20-25 °C) before starting the test run.

1. **Coated snap-off Strips:** The ready to use break apart snap-off strips are coated with Mumps Virus antigen. Store at 2-8°C. *Immediately after removal of strips, the remaining strips should be resealed in the aluminium foil along with the desiccant supplied and stored at 2-8 °C; stability until expiry date.*

2. **Mumps Virus anti-IgG Conjugate:** The bottle contains 20 ml of a solution with anti-human-IgG horseradish peroxidase, buffer, stabilizers, preservatives and an inert blue dye. The solution is ready to use. Store at 2-8°C. *After first opening stability until expiry date when stored at 2-8 °C.*

3. **Controls:** The bottles labeled with Positive, Cut-off and Negative Control contain a ready to use control solution. It contains 0.1% Kathon and has to be stored at 2-8°C. *After first opening stability until expiry date when stored at 2-8 °C.*

4. **IgG Sample Diluent:** The bottle contains 100 ml phosphate buffer, stabilizers, preservatives and an inert yellow dye. It is used for the dilution of the specimen. This ready to use solution has to be stored at 2-8°C. *After first opening stability until expiry date when stored at 2-8 °C.*

5. **Washing Solution (20x conc.):** The bottle contains 50 ml of a concentrated buffer, detergents and preservatives. Dilute
Washing Solution 1+19; e.g. 10 ml Washing Solution + 190 ml fresh and germ free redistilled water. The diluted buffer will keep for 5 days if stored at room temperature. *Crystals in the solution disappear by warming up to 37°C in a water bath. After first opening the concentrate is stable until the expiry date.*

6. **TMB Substrate Solution:** The bottle contains 15 ml of a tetramethylbenzidine/hydrogen peroxide system. The reagent is ready to use and has to be stored at 2-8°C away from the light. *The solution should be colorless or could have a slight blue tinge. If the substrate turns into blue, it may have become contaminated and should be thrown away. After first opening stability until expiry date when stored at 2-8°C.*

7. **Stop Solution:** The bottle contains 15 ml 0.2 M sulphuric acid solution (R 36/38, S 26). This ready to use solution has to be stored at 2-8°C. *After first opening stability until expiry date.*
7. Preparation and Collection of Specimen

Use human serum or plasma (citrate) samples with this assay. If the assay is performed within 5 days after sample collection, the specimen should be kept at 2-8°C; otherwise they should be aliquoted and stored deep-frozen (-20 to -70°C). If samples are stored frozen, mix thawed samples well before testing. Avoid repeated freezing and thawing.

Heat inactivation of samples is not recommended.

Sample Dilution:

Before assaying, all samples should be diluted 1+100 with IgG Sample Diluent. Dispense 10µl sample and 1ml IgG Sample Diluent into tubes to obtain a 1+100 dilution and thoroughly mix with a Vortex.

8. Assay Method

Test Preparation

Please read the test protocol carefully before performing the assay. Result reliability depends on strict adherence to the test protocol as described. If performing the test on ELISA automatic systems we recommend to increase the washing steps from three to five and the volume of washing solution from 300µl to 350µl to avoid washing
effects. Prior to commencing the assay, the distribution and identification plan for all specimens and controls should be carefully established. Select the required number of microtiter strips or wells and insert them into the holder. Please allocate at least:

- 1 well (e.g. A1) for the blank
- 1 well (e.g. B1) for the negative control
- 2 wells (e.g. C1+D1) for the cut-off control and
- 1 well (e.g. E1) for the positive control

*It is recommended to determine controls and samples in duplicate, if necessary.*

Perform all assay steps in the order given and without any appreciable delays between the steps.

A clean, disposable tip should be used for dispensing each standard and each sample.

Adjust the incubator to 37° ± 1°C.

**Assay Procedure:**

1. Dispense 100 µl controls and diluted samples into their respective wells. Leave well A1 for substrate blank.
2. Cover wells with the foil supplied in the kit.
3. **Incubate for 1 hour ± 5 min at 37±1°C.**
4. When incubation has been completed, remove the foil, aspirate the content of the wells and wash each well three times with 300µl of Washing Solution. Avoid overflows from the reaction wells. The soak time between each wash cycle should be >5sec.
At the end carefully remove remaining fluid by tapping strips on tissue paper prior to the next step!

*Note:* Washing is critical! Insufficient washing results in poor precision and falsely elevated absorbance values.

5. Dispense 100µl Mumps Virus anti-IgG Conjugate into all wells except for the blank well (e.g. A1). Cover with foil.

6. **Incubate for 30 min at room temperature.** *Do not expose to direct sunlight.*

7. Repeat step 4.

8. Dispense 100µl TMB Substrate Solution into all wells.

9. **Incubate for exactly 15 min at room temperature in the dark.**

10. Dispense 100µl Stop Solution into all wells in the same order and at the same rate as for the TMB Substrate Solution. **Any blue colour developed during the incubation turns into yellow.**

   *Note:* Highly positive samples can cause dark precipitates of the chromogen! These precipitates have an influence when reading the optical density. Predilution of the sample with physiological sodium chloride solution, for example 1+1, is recommended. Then **dilute the sample 1+100 with dilution buffer and multiply the results in NTU by 2.**

11. Measure the absorbance of the specimen at 450/620 nm within 30 min after addition of the Stop Solution.
Measurement:

Adjust the ELISA Microwell Plate Reader to zero using the standard 0.

*If - due to technical reasons - the ELISA reader cannot be adjusted to zero using the substrate blank in well A1, subtract the absorbance value of well A1 from all other absorbance values measured in order to obtain reliable results!*

**Measure the absorbance** of all wells at **450 nm** and record the absorbance values for each standard and sample.

*Dual wavelength reading using 620 nm as reference wavelength is recommended.*

Where applicable calculate the **mean absorbance values** of all duplicates.
9. Data Analysis

A. Run Validation Criteria

In order for an assay to be considered valid, the following criteria must be met:

**Substrate blank** in A1: Absorbance value < 0.100.

**Negative control** in B1: Absorbance value < 0.200 and < cut-off.

**Cut-off control** in C1 and D1: Absorbance value 0.150 – 1.300.

**Positive control** in E1: Absorbance value > cut-off.

If these criteria are not met, the test is not valid and must be repeated.

B. Calculation of Results

The cut-off is the mean absorbance value of the Cut-off control determinations.

*Example: Absorbance value Cut-off control 0.39 + absorbance value Cut-off control 0.37 = 0.76 / 2 = 0.38

Cut-off = 0.38*
C. Interpretation of Results

Samples are considered **POSITIVE** if the absorbance value is higher than 10% over the cut-off.

Samples with an absorbance value of 10% above or below the cut-off should not be considered as clearly positive or negative → **grey zone**

It is recommended to repeat the test again 2 - 4 weeks later with a fresh sample. If results in the second test are again in the grey zone the sample has to be considered **NEGATIVE**.

Samples are considered **NEGATIVE** if the absorbance value is lower than 10% below the cut-off.

D. Results in Abcam Units

\[
\text{Sample (mean) absorbance value} \times 10 = \text{[Abcam Units = NTU]} \\
\text{Cut off}
\]

Example: \( \frac{1.786 \times 10}{0.38} = 47 \text{ NTU [Abcam Units = NTU]} \)

<table>
<thead>
<tr>
<th>Cut-off:</th>
<th>10</th>
<th>NTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey zone:</td>
<td>9-11</td>
<td>NTU</td>
</tr>
<tr>
<td>Negative:</td>
<td>&lt;9</td>
<td>NTU</td>
</tr>
<tr>
<td>Positive:</td>
<td>&gt;11</td>
<td>NTU</td>
</tr>
</tbody>
</table>
E. Precision

<table>
<thead>
<tr>
<th>Inter-assay</th>
<th>n</th>
<th>Mean</th>
<th>Cv (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pos. Serum</td>
<td>12</td>
<td>28.1</td>
<td>2.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intra-assay</th>
<th>n</th>
<th>Mean</th>
<th>Cv (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pos. Serum</td>
<td>7</td>
<td>1.10</td>
<td>5.4</td>
</tr>
</tbody>
</table>

F. Specificity

The specificity is defined as the probability of the assay of scoring negative in the absence of the specific analyte. It is 87.5%.

G. Sensitivity

The sensitivity is defined as the probability of the assay of scoring positive in the presence of the specific analyte. It is > 95%.

H. Interferences

Interferences with hemolytic, lipemic or icteric sera are not observed up to a concentration of 10 mg/ml hemoglobin, 5 mg/ml triglycerides and 0.2 mg/ml bilirubin.

Note: The results refer to the groups of samples investigated; these are not guaranteed specifications.
10. Limitations

Bacterial contamination or repeated freeze-thaw cycles of the specimen may affect the absorbance values.
## 11. Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor standard curve</td>
<td>Improper standard dilution</td>
<td>Confirm dilutions made correctly</td>
</tr>
<tr>
<td></td>
<td>Standard improperly reconstituted (if applicable)</td>
<td>Briefly spin vial before opening; thoroughly resuspend powder (if applicable)</td>
</tr>
<tr>
<td></td>
<td>Standard degraded</td>
<td>Store sample as recommended</td>
</tr>
<tr>
<td></td>
<td>Curve doesn't fit scale</td>
<td>Try plotting using different scale</td>
</tr>
<tr>
<td>Low signal</td>
<td>Incubation time too short</td>
<td>Try overnight incubation at 4 °C</td>
</tr>
<tr>
<td></td>
<td>Target present below detection limits of assay</td>
<td>Decrease dilution factor; concentrate samples</td>
</tr>
<tr>
<td></td>
<td>Precipitate can form in wells upon substrate addition when concentration of target is too high</td>
<td>Increase dilution factor of sample</td>
</tr>
<tr>
<td></td>
<td>Using incompatible sample type (e.g. serum vs. cell extract)</td>
<td>Detection may be reduced or absent in untested sample types</td>
</tr>
<tr>
<td></td>
<td>Sample prepared incorrectly</td>
<td>Ensure proper sample preparation/dilution</td>
</tr>
<tr>
<td>High background</td>
<td>Wells are insufficiently washed</td>
<td>Wash wells as per protocol recommendations</td>
</tr>
<tr>
<td></td>
<td>Contaminated wash buffer</td>
<td>Make fresh wash buffer</td>
</tr>
<tr>
<td></td>
<td>Waiting too long to read plate after adding STOP solution</td>
<td>Read plate immediately after adding STOP solution</td>
</tr>
<tr>
<td>Large CV</td>
<td>Bubbles in wells</td>
<td>Ensure no bubbles present prior to reading plate</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td></td>
<td>All wells not washed equally/thoroughly</td>
<td>Check that all ports of plate washer are unobstructed/wash wells as recommended</td>
</tr>
<tr>
<td></td>
<td>Incomplete reagent mixing</td>
<td>Ensure all reagents/master mixes are mixed thoroughly</td>
</tr>
<tr>
<td></td>
<td>Inconsistent pipetting</td>
<td>Use calibrated pipettes and ensure accurate pipetting</td>
</tr>
<tr>
<td></td>
<td>Inconsistent sample preparation or storage</td>
<td>Ensure consistent sample preparation and optimal sample storage conditions (e.g. minimize freeze/thaws cycles)</td>
</tr>
<tr>
<td>Low sensitivity</td>
<td>Improper storage of ELISA kit</td>
<td>Store all reagents as recommended. Please note all reagents may not have identical storage requirements.</td>
</tr>
<tr>
<td></td>
<td>Using incompatible sample type (e.g. Serum vs. cell extract)</td>
<td>Detection may be reduced or absent in untested sample types</td>
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For further technical questions please do not hesitate to contact us by email ([technical@abcam.com](mailto:technical@abcam.com)) or phone (select “contact us” on [www.abcam.com](http://www.abcam.com) for the phone number for your region).
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