



Gastric Parietal Cell Antibodies Kit

Quantitative/qualitative assay for anti- H⁺/K⁺ dependent ATPase antibodies

Product code GD 36

96 tests

For *in vitro* diagnostic use

100108

1. Intended use

The Gastric Parietal Cell Antibodies kit is a rapid ELISA method for the detection of antibodies to H⁺/K⁺ dependent ATPase, which is the principal gastric parietal cell antigen. The components of the kit are for *in vitro* diagnostic use only. The sample diluent and assay protocol are also common to the Genesis Intrinsic Factor antibodies ELISA kit (GD35).

2. Explanation of the Test

Circulating antibodies to gastric parietal cell (GPC) intracellular antigens occur in 95% of patients with pernicious anaemia. However, GPC antibodies are also detected in approximately 60% of patients with atrophic gastritis and 22% of gastric ulcer cases. In addition, GPC antibodies are associated with other autoimmune endocrine diseases such as thyroid disease, and with diabetes, adrenal insufficiency and diseases of the hypothalamic-pituitary axis. GPC antibody levels also tend to increase in women over 40 years of age.

The Genesis kit uses highly purified H⁺/K⁺ dependent ATPase for microplate coating. Standards provided are calibrated against a Genesis reference standard.

3. Principle of the test

Diluted serum samples are incubated with highly purified H⁺/K⁺ dependent ATPase antigen immobilised on microtitre wells. After washing away unbound serum components, rabbit anti-human IgG conjugated to horseradish peroxidase is added to the wells and this binds to surface-bound antibodies in the second incubation. Unbound conjugate is removed by washing, and a solution containing 3,3',5,5'-tetramethylbenzidine (TMB) and enzyme substrate is added to trace specific antibody binding. Addition of Stop Solution terminates the reaction and provides the appropriate pH for colour development. The optical densities of the standards, controls and samples are measured using a microplate reader at 450nm. Optical density is directly proportional to antibody activity in the sample.

4. Materials included in the kit

- **Microplate:** 96 wells in 12 x 8 break-apart strips, pre-coated H⁺/K⁺ dependent ATPase, with holder in a foil bag with desiccant
- **Reagent 1: Sample Diluent** 10 mM Tris-buffered saline, pH 7.2 with antimicrobial agent, 100ml, (blue), ready to use
- **Reagent 2: Wash Buffer** 100mM Tris-buffered saline with detergent, pH 7.2, 100 ml, **concentrate** (x10)
- **Reagent 3: Conjugate** rabbit anti-human IgG conjugated to horseradish peroxidase in protein stabilising solution and antimicrobial agent, 12 ml, (red), ready to use
- **Reagent 4: TMB Substrate** aqueous solution of TMB and hydrogen peroxide, 12 ml, ready to use
- **Reagent 5: Stop Solution** 0.25M sulphuric acid, 12 ml, ready to use
- **Standards:** 100, 200, 500 & 1000 U/ml, 1ml of 10mM Tris-buffered saline containing human serum IgG antibodies to H⁺/K⁺ dependent ATPase ready to use
- **Positive Control:** 1ml of 10mM Tris-buffered saline containing human serum IgG antibodies to H⁺/K⁺ dependent ATPase ready to use
- **Negative Control:** 1ml of 10mM Tris-buffered saline containing normal human serum, ready to use
- **Instructions for use**

5. Other equipment required

1. Test tubes for dilution • graduated cylinder for preparing wash buffer • precision pipettes and disposable tips to deliver 10 μ l, 100 μ l, 1ml • EIA microplate washer or multi-channel pipette or wash bottle • distilled or de-ionised water • absorbent paper • EIA microplate reader with 450nm and optional 620nm reference filter. Alternatively, a suitable automated system may be used.
2. Instrumentation, whether manual or automated, should meet the following criteria: pipettes with better than 3% imprecision with no carry over between pipetting steps; microplate washers should remove 99% of fluid; automated machines should minimise time between washing and adding the next reagent.

6. Precautions

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6.1 Safety Precautions

1. All reagents in this kit are for *in vitro* diagnostic use only.
2. Only experienced laboratory personnel should use this test. The test protocol must be followed strictly.
3. All human source material used in the preparation of standards and controls for this product have been tested and found negative for antibodies to HIV, HbsAg and HCV. No test method, however, can offer complete assurance that infectious agents are absent. Therefore, all reagents containing human material should be handled as if potentially infectious. Operators should wear gloves and protective clothing when handling any patient sera or serum based products.
4. Reagents of this kit contain antimicrobial agents and the TMB Substrate solution contains 3,3',5,5'-tetramethylbenzidine. Avoid contact with the skin and eyes. Rinse immediately with plenty of water if any contact occurs.
5. The Stop Solution contains 0.25M sulphuric acid. Avoid contact with skin and eyes. Rinse immediately with plenty of water if contact occurs.
6. Any liquid that has been brought into contact with potentially infectious material has to be discarded in a container with a disinfectant. Disposal must be performed in accordance with local legislation.

6.2 Technical Precautions

1. Strips and solutions should not be used if the foil bag is damaged or liquids have leaked.
2. Allow all reagents and the microplate to reach room temperature before use. Ensure that the microplate foil bag containing any unused strips is well sealed and contains the desiccant to avoid moisture. Store at 2 – 8°C after use.
3. When automating, consider excess volumes required for setting up the instrument and dead volume of robot pipette
4. Include the Positive and Negative Control in every test run to monitor for reagent stability and correct assay performance.
5. Strictly observe the indicated incubation times and temperature.
6. Ensure that no cross-contamination occurs between wells. Keep all pipettes and other equipment used for Conjugate completely separate from the TMB Substrate reagent.
7. When pipetting Conjugate or TMB Substrate, aliquots for the required numbers of wells should be taken to avoid multiple entry of pipette tips into the reagent bottles. Never pour unused reagents back into the original bottles.
8. Do not allow microwells to dry between incubation steps.
9. Strictly follow the described wash procedure. Insufficient washing may cause high background signal.
10. Avoid direct sunlight and exposure to heat sources during all incubation steps.
11. Replace colour-coded caps on their correct vials to avoid cross-contamination
12. It is important to dispense all samples and controls into the wells without delay. Therefore ensure that all samples are ready to dispense.

7. Shelf life and storage conditions

On arrival, store the kit at 2 – 8°C. Once opened the kit is stable for 3 months (or until its expiry date if less than 3 months). Do not use kits beyond their expiry date. Do not freeze any kit component. The diluted Wash Buffer has a shelf life of 3 months if stored in a closed bottle at 2 – 8°C.

8. Specimen collection and storage

Serum or plasma samples may be used and should be stored at -20°C for long-term storage. Frozen samples must be mixed well after thawing and prior to testing. Repeated freezing and thawing can affect results. Addition of preservatives to the serum sample may adversely affect the results. Microbially contaminated, heat-treated or specimens containing particulate matter should not be used. Grossly haemolysed, icteric or lipaemic specimens should be avoided.

9. Preparation of reagents

Dilute the Wash Buffer (**Reagent 2**) 1: 9 in distilled water to make sufficient buffer for the assay run e.g. add 50ml wash buffer concentrate to 450ml water.

10. Assay Procedure

1. Dilute patient samples 1:100 in Sample Diluent (e.g. 10µl serum plus 1ml diluent).
2. Assemble the number of strips required for the assay.
3. For quantitative assays, dispense into appropriate wells 100 µl of sample diluent as the 0 U/ml standard, followed by 100µl of each Standard, the Negative and Positive Controls and the diluted patient serum. For qualitative assays, dispense only the 100 U/ml Standard together with controls and samples.
4. Incubate for **30** minutes at room temperature.
5. After 30 minutes, decant or aspirate the well contents and wash the wells 3 times using automated washing or the manual wash procedure (see below). Careful washing is the key to good results. **Do not allow the wells to dry out.**

Manual Wash Procedure:

Empty the wells by inversion. Using a multi-channel pipette or wash bottle, fill the wells with wash buffer. Empty by inversion and blot the wells on absorbent paper. Repeat this wash process 2 more times.

6. Dispense 100µl of Conjugate (**Reagent 3**) into each well. Incubate the wells for **30** minutes at room temperature.
7. After 30 minutes, discard the well contents and carefully wash the wells 4 times with Wash Buffer. Ensure that the wells are empty but do not allow to dry out.
8. Using a repeating dispenser, rapidly dispense 100µl of TMB Substrate (**Reagent 4**) into each well. Incubate the plate for **10** minutes.
9. Add 100µl of Stop Solution (**Reagent 5**) to each well. To allow equal reaction times, the Stop Solution should be added to the wells in the same order as the TMB Substrate.
10. Read the optical density (OD) of each well at 450nm in a microplate reader within 10 minutes. A 620nm filter may be used as a reference wavelength.

11. Quality control

Quality control data is supplied on the lot-specific QC certificate included in the kit.

Controls are intended to monitor for substantial reagent failure.

Any well positive by spectrophotometer but without visible colour should be cleaned on the underside and re-read. If OD values below zero are observed, the wavelengths used should be verified, the reader re-blanked to air and the measurements repeated.

12. Interpretation of Results

Quantitative results

Plot the OD of each standard against its concentration and draw the best-fit curve through the points. Read the unknowns off this curve. Based on in-house studies, values below 100 U/ml are considered normal. Values above 100 U/ml are regarded as positive. Values above 1000 U/ml should be re-assayed at a higher dilution e.g. 1:400.

Qualitative results

Samples giving ODs greater than that of the 100 U/ml standard are regarded as positive.

13. Limitations of the Procedure

1. A negative result should not be used as a sole criterion to rule out pernicious anaemia or other autoimmune disease.
2. GPC antibodies occur at low levels in other autoimmune and non-autoimmune conditions. Results must be considered in conjunction with other clinical observations and diagnostic tests.
3. It has been reported that GPC antibodies increase in healthy women over 40 years of age. Age should be taken into account when reviewing results.

14. Performance Characteristics

An evaluation of the Genesis GPC IgG ELISA was carried out by UKNEQAS using a panel of 35 serum samples from a variety of clinical sources including patients with raised IgG GPC antibodies, patients with raised levels of smooth muscle IgG antibodies, patients with detectable anti-mitochondrial antibodies and normal blood donors. The performance of the kit was compared with an indirect immunofluorescence technique using rodent substrate. The relative sensitivity and specificity are given in the table below:

Sensitivity	78%
Specificity	96%
Positive predictive value	88%
Negative predictive value	93%
Overall agreement	91%

Comparison to a predicate commercial kit

The Genesis GPC IgG ELISA kit was compared with another commercial GPC IgG ELISA kit and the following data was obtained:

	Predicate kit +	Predicate kit -
Genesis Kit +	19	0
Genesis Kit -	1	39

15. Reproducibility

Within assay coefficient of variation: 5-8%

Between assay coefficient of variation < 12%

Method Summary

- Dilute sera 1:100 with Sample Diluent (**Reagent 1**)
- Dispense Standards, the Positive and Negative Controls and the diluted sample into the microplate wells
- Incubate for **30** minutes at room temperature.
- *Wash the wells three times*
- Dispense 100µl of Conjugate (**Reagent 3**) into each well
- Incubate at room temperature for **30** minutes
- *Wash the wells four times*
- Add 100µl of TMB Substrate (**Reagent 4**) to each well
- Incubate at room temperature for **10** minutes
- Add 100µl Stop Solution (**Reagent 5**) to each well
- Read the optical density at 450nm (single wavelength) or 450/620nm (dual wavelength).

Further Reading

Bigazzi PE *et al* (1986) Antibodies to tissue specific endocrine, gastrointestinal and neurological antigens. *Manual of Clinical Laboratory Immunology* 3rd Edition, 762 – 770
 Karlson FA *et al* (1988) Major parietal cell antigen in autoimmune gastritis with pernicious anaemia is the acid producing H+/K+ ATPase of stomach. *J Clin Invest* 81, 475 – 479
 Whittingham S, *et al* (1985) Pernicious anaemia and gastritis atrophy. *The Autoimmune Diseases*, Orlando Academic Press.
 Callaghan JS, *et al* (1993) Alpha and beta subunits of the gastric H+/K+ ATPase are concordantly targeted by parietal cell antibodies associated with autoimmune gastritis. *Autoimmunity* 16, 289 - 295