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# Human Immunoglobulin G, IgG ELISA Kit

Catalog No: E0544h

96 Tests

Operating instruction



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**FOR RESEARCH USE ONLY; NOT FOR THERAPEUTIC OR DIAGNOSTIC APPLICATIONS!  
PLEASE READ THROUGH ENTIRE PROCEDURE BEFORE BEGINNING!**

## **Intended use**

This immunoassay kit allows for the in vitro quantitative determination of human Immunoglobulin G, IgG concentrations in cell culture supernates, serum, plasma and other biological fluids.

## **Introduction**

Immunoglobulin G (IgG) is a monomeric immunoglobulin, built of two heavy chains  $\gamma$  and two light chains. Each IgG has two antigen binding sites. It is the most abundant immunoglobulin and is approximately equally distributed in blood and in tissue liquids, constituting 75% of serum immunoglobulins in humans. IgG molecules are synthesised and secreted by plasma B cells.

IgG antibodies are predominately involved in the secondary antibody response, (the main antibody involved in primary response is IgM) which occurs approximately one month following antigen recognition, thus the presence of specific IgG generally corresponds to maturation of the antibody response. Pro-inflammatory cytokines particularly IL-4 and IL-2, have a crucial role in activation of the IgG antibody response.

This is the only isotype that can pass through the human placenta, thereby providing protection to the fetus in utero. Along with IgA secreted in the breast milk, residual IgG absorbed through the placenta provides the neonate with humoral immunity before its own immune system develops.

It can bind to many kinds of pathogens, for example viruses, bacteria, and fungi, and protects the body against them by agglutination and immobilization, complement activation (classical pathway), opsonization for phagocytosis and neutralization of their toxins. It also plays an important role in Antibody-dependent cell-mediated cytotoxicity (ADCC).

## **Test principle**

This assay employs the competitive inhibition enzyme immunoassay technique. A polyclonal antibody specific for human IgG has been pre-coated onto a microplate. A competitive inhibition reaction is launched between HRP labeled human IgG and unlabeled human IgG (Standards or samples) with the pre-coated antibody specific for human IgG. The more the amount of human IgG in samples, the less the HRP labeled human IgG bound by pre-coated antibody. The substrate solution are added to the wells,

respectively. And the color develops in opposite to the amount of human IgG bound in the initial step. The color development is stopped and the intensity of the color is measured.

### Materials and components

Assay plate	1
Standard	2 x 200ul
Sample Diluent	1 x 20ml
Assay Diluent A	1 x 10ml
Detection Reagent A	2 x 120ul
Wash Buffer (25 x concentrate)	1 x 30ml
Substrate	1 x 10ml
Stop Solution	1 x 10ml
Plate sealer for 96 wells	1 x 5
Instructions	1

### Other supplies required

Luminometer.

Pipettes and pipette tips.

EP tube

Deionized or distilled water.

### Sample collection and storage

**Serum** - Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 15 minutes at approximately 1000 × g. Remove serum and assay immediately or aliquot and store samples at -20°C or -80°C.

**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. Store samples at -20°C or -80°C. Avoid repeated freeze-thaw cycles.

**Cell culture supernates and other biological fluids** - Remove particulates by centrifugation and assay immediately or aliquot and store samples at -20°C or -80°C. Avoid repeated freeze-thaw cycles.

**Sample preparation** - Serum/plasma samples require about 100 fold dilution.

**Note:** Serum, plasma, and cell culture supernatant samples to be used within 7 days may be stored at 2-8 °C, otherwise samples must stored at -20°C (≤ 1 months) or -80°C (≤ 2 months) to avoid loss of bioactivity and contamination. Avoid freeze-thaw cycles. When performing the assay slowly bring samples to room temperature.

DO NOT USE HEAT-TREATED SPECIMENS.

### Limitations of the procedure

1. The kit should not be used beyond the expiration date on the kit label.
2. Do not mix or substitute reagents with those from other lots or sources.
3. If samples generate values higher than the highest standard, further dilute the samples with the Assay Diluent and repeat the assay. Any variation in standard

diluent, operator, pipetting technique, washing technique, incubation time or temperature, and kit age can cause variation in binding.

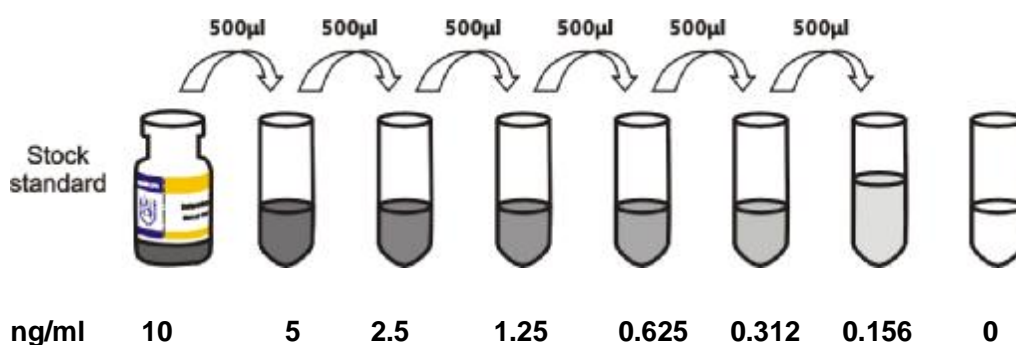
4. This assay is designed to eliminate interference by soluble receptors, ligands, binding proteins, and other factors present in biological samples. Until all factors have been tested in the Quantikine Immunoassay, the possibility of interference cannot be excluded.

### Reagent preparation

Bring all reagents to room temperature before use.

**Wash Buffer** - If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Dilute 30 mL of Wash Buffer Concentrate into deionized or distilled water to prepare 750 mL of Wash Buffer.

**Standard** - Reconstitute the **Standard** with 0.8 mL of **Sample Diluent**. This reconstitution produces a stock solution of 10 ng/ml. Allow the standard to sit for a minimum of 15 minutes with gentle agitation prior to making serial dilutions (Making serial dilution in the wells directly is not permitted). The undiluted standard serves as the high standard (10 ng/ml). The **Sample Diluent** serves as the zero standard (0 ng/ml).



**Detection Reagent A** - Dilute to the working concentration using **Assay Diluent A** (1:100), respectively.

### Assay procedure

Allow all reagents to reach room temperature (Please do not dissolve the reagents at 37°C directly.). **All the reagents should be mixed thoroughly by gently swirling before pipetting. Avoid foaming.** Keep appropriate numbers of strips for 1 experiment and remove extra strips from microtiter plate. Removed strips should be resealed and stored at 4°C until the kits expiry date. Prepare all reagents, working standards and samples as directed in the previous sections. Please predict the concentration before assaying. If values for these are not within the range of the standard curve, users must determine the optimal sample dilutions for their particular experiments.

1. Pipette 50uL of the reference standard or Control, or sample\* per tube and then add 50 uL of Detection Reagent A to each tube. Mix each tube thoroughly. Add 100ul the mixed solution per well. Cover with a new Plate sealer. Incubate for 1 hour at 37°C. Detection Reagent A may appear cloudy. Warm to room temperature and mix gently

until solution appears uniform.

2. Aspirate each well and wash, repeating the process three times for a total of five washes. Wash by filling each well with Wash Buffer (350 uL) using a squirt bottle, multi-channel pipette, manifold dispenser or autowasher for 5 times . Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
3. Add 90 uL of Substrate Solution to each well. Cover with a new Plate sealer. Incubate for 30 minutes at 37°C. Protect from light.
4. Add 50 uL of Stop Solution to each well. If color change does not appear uniform, gently tap the plate to ensure thorough mixing.
5. Determine the optical density of each well within 30 minutes, using a microplate reader set to 450 nm.

**Important Note:**

1. Absorbance is a function of the incubation time. Therefore, prior to starting the assay it is recommended that all reagents should be freshly prepared prior to use and all required strip-wells are secured in the microtiter frame. This will ensure equal elapsed time for each pipetting step, without interruption.
2. Please carefully reconstitute Standards or working Detection Reagent A according to the instruction, and avoid foaming and mix gently until the crystals have completely dissolved. The reconstituted Standards can be used only once. This assay requires pipetting of small volumes. To minimize imprecision caused by pipetting, ensure that pipettors are calibrated. It is recommended to suck more than 10µl for once pipetting.
3. To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary. Do not allow wells to sit uncovered for extended periods between incubation steps. Once reagents have been added to the well strips, DO NOT let the strips DRY at any time during the assay.
4. For each step in the procedure, total dispensing time for addition of reagents to the assay plate should not exceed 10 minutes.
5. To avoid cross-contamination, change pipette tips between additions of each standard level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.
6. The wash procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings.
7. Duplication of all standards and specimens, although not required, is recommended.
8. Substrate Solution is easily contaminated. Please protect it from light.

**Specificity**

This assay recognizes recombinant and natural human IgG. No significant cross-reactivity or interference was observed.

**Sensitivity**

The minimum detectable dose of human IgG is typically less than 0.39 ug/ml.

The sensitivity of this assay, or Lower Limit of Detection (LLD) was defined as the lowest protein concentration that could be differentiated from zero.

### **Detection Range**

0.156 - 10 ng/ml. The standard curve concentrations used for the ELISA's were 10 ng/ml, 5 ng/ml, 2.5 ng/ml, 1.25 ng/ml, 0.625 ng/ml, 0.312 ng/ml, 0.156 ng/ml

### **Calculation of results**

Average the duplicate readings for each standard, control, and sample and subtract the average zero standard optical density. Create a standard curve by reducing the data using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, construct a standard curve by plotting the mean absorbance for each standard on the x-axis against the 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 IgG concentrations versus the log of the O.D. and the best fit line can be determined by regression analysis. It is recommended to use some related software to do this calculation, such as curve expert 13.0. This procedure will produce an adequate but less precise fit of the data. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

### **Storage of test kits and instrumentation**

1. Unopened test kits should be stored referring to the package label for frequent use, and stored at -20°C for long time storage. The unused strips should be kept in a sealed bag and stored at 2-8°C in their pouch with the desiccant provided to minimize exposure to damp air. The test kit may be used throughout the expiration date of the kit (six months from the date of manufacture). Opened test kits will remain stable until the expiring date shown, provided it is stored as prescribed above.
2. There may be some foggy substance in the wells when the plate is opened at the first time. It will not have any effect on the final assay results.
3. Do not remove microtiter plate from the storage bag until needed.
4. A microtiter plate reader with a bandwidth of 10nm or less and an optical density range of 0-3 OD or greater at 450nm wavelength is acceptable for use in absorbance measurement.
5. Use fresh disposable pipette tips for each transfer to avoid contamination.
6. Do not substitute reagents from one kit lot to another. Use only the reagents supplied by manufacturer.
7. Valid period: six months.

### **Precaution**

The Stop Solution suggested for use with this kit is an acid solution. Wear eye, hand, face, and clothing protection when using this material.