IgE

Diagnostic reagent for determination of IgE (Immunoglobulin E) concentration.
Liquid. Dual reagents. Store at +2/+8°C. For in Vitro Diagnostic Use (IVD). **Do not freeze.**

Ref No	Pack
MH-322	90 mL

Changes made in the instructions for use are marked as grey.

INTENDED USE

This test is used for the quantitative determination of immunoglobulin E (IgE) concentration in human serum and plasma.

GENERAL INFORMATION

IgE is one of 5 immunoglobulin classes. It consists of two identical light (L) and two identical heavy (H) chain and differs from that of others by the existence of epsilon (ε) heavy chain. IgE is a monomer consisting of 4 fixed areas, contrary to the other immunoglobulins containing only 3. Molecular weight of IgE is 190 kDa due to this extra area, whereas that of IgD is 150 kDa. IgE concentration (<1 µg/ml) in circulation is approximately 300 times less than IgG and is present the least when compared to the other immunoglobulins (IgG > IgA > IgM > IgD > IgE). IgE has quite a short life span in plasma, contrary to the IgG antibodies that have nearly 3-week half life span (half life, <1 day), however, receptor-bound IgE is able to stay fixed on the mast cells in tissues for weeks or months. IgE is produced by the IgE plasma cells present especially in the respiratory tracts and mucosal areas in gastrointestinal area where IgE causes allergic reactions and the parasytic worms specifically like helmint to be kept away. Degranulation of mediators released by mast cells which IgE binds to increases the vascular permeability and local inflammation. This process results in the aggregation of eosinophils from the blood to the site of parasitic infection. Eosinophils also bind itself to IgE on the surface of the parasyte and may release the content of granules in order to demolish the parasitic worm through an ADCC-type mechanism. IgE has a vital importance for the "first line of defense" against the patogenes that enter the body through epithelium barriers.[1]

A harmful effect of IgE may occur when it triggers the allergic reactional mast cell degranulation upon binding itself to some harmless antigenes such as pollens.[1,2]

Measurement of IgE has various benefits in the diagnosis and treatment of allergic disorders. High level of total IgE is seen in not only allergic disorders, but some non-allergic diseases such as infections, atopic, inflammatory diseases and neoplasmas as well.[1]

TEST PRINCIPLE

Immunoturbidimetric measurement

The IgE reagent contains latex particles coated with anti-human IgE monoclonal antibody. When a sample containing IgE is mixed with the reagent, a reaction takes place which can be measured by turbidimetry.

REAGENT COMPONENTS

Reagent 1:
Buffer PBS modif : > 25 mmol/L
Sodium azide : ≤ %0.1

Reagent 2 Latex Particule:
Anti-IgE (goat) Latex
Buffer PBS modif : ≤ 45 mmol/L
Sodium azide : ≤ %0.1

REAGENT PREPARATION

Reagents are ready for use.

REAGENT STABILITY AND STORAGE

Reagents are stable at +2/+8˚C till the expiration date stated on the label which is only for closed vials.

Once opened vials are stable for 30 days at +2/+8°C in optimum conditions. On board stability is strongly related to auto analyzers' cooling specification and carry-over values.

Reagent stability and storage data have been verified by using Clinical and Laboratory Standards Institute (CLSI) EP25-A protocol.[3]

SAMPLE REQUIREMENTS

Serum and plasma samples collected with Na-EDTA, K-EDTA, Na-Heparin, Li-Heparin sample tubes can be used.

IgE activity stability in serum and plasma[14]:
7 days at +2/+8ºC
6 months at -20ºC

CALIBRATION AND QUALITY CONTROL

Calibration: The assay requires the use of an IgE Calibrator Set .
IGE Calibrator Set (1-4 Levels)-Liquid
Ref No: VT-021

Calibration stability is 30 days.Calibration stability depends on the application characteristics and cooling capacity of the autoanalyzer used.

Control: Commercially available control material with established values determined by this method can be used. We recommend:

IgE Control Set - Liquid
Ref.No: VT-020

At least two level controls must be run once in every 24 hours. Each laboratory should determine its own quality control scheme and procedures. If quality control results are not within acceptable limits, calibration is required.

REFERENCE INTERVALS / MEDICAL DECISION LEVELS

Newborn	: 1.50 IU/mL
Up to age 1	: 15.0 IU/mL
1 - 5 year-old children	: 60.0 IU/mL
6 - 9 year-old children	: 90.0 IU/mL
10 - 15 year-old children	: 200.0 IU/mL
Adults	: 100.0 IU/mL

Note 1: Serum IgE concentration increases from birth to age 15 and decreases later in the adulthood. Also, men tend to have higher serum IgE concentrations than women.[1]

Note 2: There is no specific predictive value that distinguishes patients with allergic disease from those without, and there is a significant overlap.[1]

Each laboratory should investigate the transferability of the expected values to its own patient population and if necessary, determine its own reference range.

Reference interval data have been verified by using CLSI EP28-A3c protocol.[4]

PERFORMANCE CHARACTERISTICS

Measuring Interval

According to CLSI EP34-ED1:2018, “Measuring Interval” refers to the interval where the analyte concentration is measured with intended accuracy in terms of medical and laboratory requirements without dilution, concentrating or any kind of pre-treatment that is between the analyte’s lower limit of quantitation (LLoQ) and upper limit of quantitation (ULoQ).[5]

The determined analytic measuring interval for IgE is 2-500 IU/mL.

Detection Capability

Limit of Detection (LoD): 1 IU/mL

Limit of Quantitation (LoQ): 2 IU/mL

Note: LoQ values are based on Coefficient of Variation Percentage (CV) ≤ 20%.

LoD and LoQ values have been verified by using CLSI EP17-A2:2012 protocol.[6]

Linearity

This method shows measurement linearity in the activities up to 500 IU/mL. Autoanaylzer’s auto-dilution system can be used if the concentrations have higher values. See device manual for further information.

For the manual dilution procedure, dilute the sample 1:5 using 0.90% isotonic. After this process, multiply the result of the reworked sample by the dilution factor. Do not report the sample result after dilution if it is marked as lower than the linear lower limit. Rerun with a suitable dilution.

Linearity Studies data have been verified by using CLSI EP06-A:2003 protocol.[7]

Precision

Running system has been developed according to 20x2x2 “The Single Site” protocol. Repeatability and Within-Laboratory Precision/Within-Device values have been obtained according to the running results.

According to the protocol in use, 2 separate runs per day have been made for 20 days (no obligation for being consecutive days). This protocol has been applied to each low and high samples separately and 80 results have been obtained for each one. Statistically, the results have been obtained using 2-factor Nested-ANOVA model.[8]

Repeatability (Within Run) and Repeatability (Day to Day) SD (standard deviation) and CV% values of IgE have been given in the table 1 and 2 respectively.

Table 1. IgE Repeatability (Within Run) results obtained from samples in two different concentrations

Mean Concentration	SD	CV%	n
76 IU/mL	1.11	1.5	80
218 IU/mL	2.45	1.1	80

Note: This working system has been named “Within-Run Precision” in the previous CLSI - EP05-A2 manual.[9]

Table 2. IgE Repeatability (Day to Day) results obtained from samples in two different concentrations

Mean Concentration	SD	CV%	n
76 IU/mL	2.40	3.2	80
218 IU/mL	3.17	1.5	80

Note: This working system has been named “Total Precision” in the previous CLSI - EP05-A2 manual.[9]

Method Comparison

As a result of the statistical evaluation of the method comparison data:

Passing-Bablock equation:[10]

y= 1.01x – 4 IU/mL
r= 0.98

Prozone Effect: No prozone effect has been observed up to 16000 IU/mL tested for IgE.

Interference

Endogenous interferant and analyte concentrations that have been used in the IgE scanning tests has been determined according to "CLSI EP37-ED1:2018" and "CLSI EP07-ED3:2018" manuals.[11,12]

The total acceptable error rate, which is going to be used to detect whether the observed differential value obtained from IgE interference scanning test is appropriate, is determined as ±10%.[13]

In IgE test results, no significant interaction has been observed in the determined endogenous interferant and analyte concentrations or between interferants and analyte.

Interferant-Concentration	IgE Target (IU/mL)	N*	Observed Recovery %
Total Bilirubin 25 mg/dL	57	3	%94
	225	3	%97
Lipemi 1000 mg/dL	57	3	%94
	225	3	%96
Hemoglobin 10 g/L	57	3	%91
	225	3	%92

** Total acceptable error rate determined as interference limit and repeatability (within run) pre-detected for the related method were used for the calculations of how many times the control and test samples prepared as a serum pool are going to be run repetitively. In the calculations, the accepted error rate for type 1 (α error) was 5% and for type 2 (β error) was 10% (90% power).*[12]

It should be noted that endogenous interferants, as well as various medicines and metabolites, anticoagulants (e.g. Heparin, EDTA, citrate, oxalate) and preservatives (e.g. sodium floride, iodoacetate, hydrochloride acide) such as additives, materials that may contact with samples during collection and processing (serum separator devices, sample collection containers and contents, catheters, catheter wash solutions, skin disinfectants, hand cleaners and lotions, glass washing detergents, powder gloves), dietary substances known to affect some specific tests (caffeine, beta-carotene, poppy seeds, etc.), or some substances present in a sample that cause foreign proteins (heterophilic antibodies, etc.), autoimmune response (autoantibodies, etc.), or due to malignancy (for example, interference by paraproteins with phosphate testing and indirect ion selective electrode methods) may show some negative effects that will cause various attempts and some misjudgements.[12]

These performance characteristics have been obtained using an autoanalyzer. Results may vary slightly when using different equipment or manual procedures.

WARNINGS AND PRECAUTIONS

IVD**:** For in Vitro Diagnostic use only.
Do not use expired reagents.
Reagents with two different lot numbers should not be interchanged.
For professional use.
Follow Good Laboratory Practice (GLP) guidelines.
Contains sodium azide.

CAUTION: Human source samples are processed with this product. All human source samples must be treated as potentially infectious materials and must be handled in accordance with OSHA standards.

Danger

EUH032 :Releases a very toxic gas if contacts with acid.
H317 :May cause allergic skin reaction.

Precaution

P280 :Use protective gloves / clothes / glasses / mask.
P264 :Wash your hands properly after using.
P272 :Contaminated work clothes should not be allowed to be used outside of the workplace.

Intervention

P302+P352 :Wash with plenty of water and soap if it contacts with skin.
P333+P313 :Seek medical help if it irritates your skin or develops rash.
P362+P364 :Remove contaminated clothes and wash properly before using.

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SYMBOLS

IVD	In Vitro Diagnostic Medical Device
LOT	Lot Number
R1	Reagent 1
R2	Reagent 2
GTIN	Global Trade Item Number
REF	Reference Number
GLP	Good Laboratory Practices
FOR USE WITH	Identifies Products to Be Used Together
PRODUCT OF TURKEY	Product of Turkey
	Manufacturer
	Expiration Date
	Temperature Limits
	Consult Instructions for Use
	Caution
	Number of Tests

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