BECKMAN COULTER CE

AU

Instructions For Use

IgM
IgM

REF OSR61173 4 x 14 mL R1, 4 x 11 mL R2

For *in vitro* diagnostic use only.

ANNUAL REVIEW

Reviewed by	Date	Reviewed by	Date

PRINCIPLE

INTENDED USE

Immuno-turbidimetric test for the quantitative determination of immunoglobulin M (IgM) in human serum and plasma on Beckman Coulter analysers.

SUMMARY AND EXPLANATION

Reference[1,2,3]

Immunoglobulin classes IgG, IgA, IgM, IgD and IgE are present in descending order of concentration in the serum of healthy people. IgM composes approximately 7% of the total plasma immunoglobulins and is the first immunoglobulin to respond to an antigenic stimulus. IgM normally circulates in plasma in a pentameric form and because of its relatively large molecular mass (971 kDa), 75-80% of IgM is located intravascularly. The IgM class includes the natural antibodies, e.g. the ABO blood group isohaemagglutinins, saline Rh and antibodies to IgG e.g. rheumatoid factors.

The essential functions of IgM in the immune response are the agglutination of pathogens and the activation of the classical complement pathway.

Changes in serum immunoglobulin concentrations can be classified as follows:

Hypogammaglobulinemias, IgM deficiency is rare and is associated with recurrent pyrogenic infections.

Polyclonal gammopathies, levels of IgM are increased in primary biliary cirrhosis, haemoprotozoan infections such as malaria, viral or bacterial infections and rheumatoid arthritis.

Monoclonal gammopathies, e.g. in Waldenström's macroglobulinemia and malignant lymphoma.

Elevated levels of IgM in cord serum or during the first four weeks of life may indicate intrauterine or neonatal infections such as rubella, cytomegalovirus, toxoplasmosis or syphilis.

METHODOLOGY

When a sample is mixed with R1 buffer and R2 antiserum solution, human IgM reacts specifically with anti-human IgM antibodies to yield insoluble aggregates. The absorbance of these aggregates is proportional to the IgM concentration in the sample.

SPECIMEN

TYPE OF SPECIMEN

Serum and EDTA or heparinised plasma

SPECIMEN STORAGE AND STABILITY

Stable in serum and plasma for 4 months when stored at 2…8°C and 2 months when stored at 15…25°C.[4]

Lipemic samples should be avoided.

REAGENTS

WARNING AND PRECAUTIONS

Exercise the normal precautions required for handling all laboratory reagents.

Dispose of all waste material in accordance with local guidelines.

This product contains material of animal origin. The product should be considered as potentially capable of transmitting infectious diseases.

REACTIVE INGREDIENTS

Final concentration of reactive ingredients:

Tris buffer (pH 7.2)	50 mmol/L
Polyethylene glycol 6000	3.5%
Goat anti-IgM antibodies	Dependent on titre
Preservative	

The concentrations of the reactive components of the reagents shown on the kit label are the actual concentrations in the individual R1/R2 vials. The reagent composition which is shown in the Instructions For Use is the final concentration of these components in the reaction cuvette after addition of R1, Sample, and R2.

⚠ CAUTION

Sodium azide preservative may form explosive compounds in metal drain lines. See NIOSH Bulletin: Explosive Azide Hazard (8/16/76).
To avoid the possible build-up of azide compounds, flush wastepipes with water after the disposal of undiluted reagent. Sodium azide disposal must be in accordance with appropriate local regulations.

GHS HAZARD CLASSIFICATION

IgM-R1	WARNING	
	H316	Causes mild skin irritation.
	P332+P313	If skin irritation occurs: Get medical advice/attention.
		Tris(hydroxymethyl)– aminomethane 1 - 5%

SDS	Safety Data Sheet is available at techdocs.beckmancoulter.com

REAGENT PREPARATION

The reagents are ready for use and can be placed directly on board the instrument

REAGENT STORAGE AND STABILITY

The reagents are stable, unopened, up to the stated expiry date when stored at 2…8°C. Once open, reagents stored on board the instrument are stable for 90 days.

CALIBRATION

CALIBRATOR REQUIRED

Serum Protein Multi-Calibrator ODR3021

The calibrator IgM values are traceable to IFCC (International Federation of Clinical Chemistry) standard CRM 470.

Recalibrate the assay every 90 days or when the following occur:

Change in reagent lot or significant shift in control values;

Major preventative maintenance was performed on the analyser or a critical part was replaced

Following calibration, the resulting curve should be visually reviewed, on the Beckman Coulter analyser, for acceptability using the software options - Routine, Calibration Monitor, Calibration Curve. Quality control procedures should be undertaken immediately following calibration in accordance with good laboratory practice.

QUALITY CONTROL

ITA Control Sera ODC0014, ODC0015 and ODC0016 or other control materials with values determined by this Beckman Coulter system may be used.

Each laboratory should establish its own control frequency however good laboratory practice suggests that controls be tested each day patient samples are tested and each time calibration/blanking is performed.

The results obtained by any individual laboratory may vary from the given mean value. It is therefore recommended that each laboratory generates analyte specific control target values and intervals based on multiple runs according to their requirements. These target values should fall within the corresponding acceptable ranges given in the relevant product literature.

If any trends or sudden shifts in values are detected, review all operating parameters.

Each laboratory should establish guidelines for corrective action to be taken if controls do not recover within the specified limits.

TESTING PROCEDURE(S)

Refer to the appropriate Beckman Coulter AU analyser User Guide/Instructions For Use (IFU) for analyser-specific assay instructions for the sample type as listed in the Intended Use statement. The paediatric application is suitable for use with small volume serum/plasma samples.

Data check parameters are required, see setting sheets for specific instrument details.

CALCULATIONS

The Beckman Coulter analysers automatically compute the IgM concentration of each sample.

REPORTING RESULTS

REFERENCE INTERVALS

Reference[5,6]

Adults	0.4 – 2.3 g/L (40 – 230 mg/dL)
Children	0.2 – 2.0 g/L (20 – 200 mg/dL)

Expected values may vary with age, sex, sample type, diet and geographical location. Each laboratory should verify the transferability of the expected values to its own population, and if necessary determine its own reference interval according to good laboratory practice. For diagnostic purposes, results should always be assessed in conjunction with the patient's medical history, clinical examinations and other findings.

PROCEDURAL NOTES

LIMITATIONS

The IgM assay has been optimised to reduce the risk of prozone occurrence in the presence of abnormally high immunoglobulin concentrations.

However, as a precaution samples from patients with suspected paraproteinaemia should also be tested by electrophoresis.

Samples with very high IgM concentrations (> 100 g/L polyclonal) can generate false low results without appropriate "Z" flags due to excess antigen in the sample.

When running elevated samples on any of the AU system analysers, “F” flags or a combination of “F” and “Z” flags may be obtained. Such samples should be diluted using physiological saline so as to recover close to the middle of the measuring range.

Samples with extremely abnormal optical characteristics, especially turbidity, may produce atypical results.

INTERFERENCES

Results of studies conducted to evaluate the susceptibility of the method to interference were as follows:

Icterus:	Interference less than 10% up to 40 mg/dL or 684 µmol/L bilirubin
Haemolysis:	Interference less than 10% up to 5 g/L haemoglobin
Lipemia:	Interference less than 10% up to 200 mg/dL Intralipid

Refer to Young[7] for further information on interfering substances.

PERFORMANCE CHARACTERISTICS

PERFORMANCE CHARACTERISTICS

Data contained within this section is representative of performance on Beckman Coulter systems. Data obtained in your laboratory may differ from these values.

LINEARITY

The test is linear within a concentration range of 0.2 – 5.0 g/L (20 – 500 mg/dL).

SENSITIVITY

The lowest detectable level in serum on an AU640 analyser was estimated at 0.01 g/L.

The lowest detectable level represents the lowest measurable level of IgM immunoglobulins that can be distinguished from zero. It is calculated as the absolute mean plus three standard deviations of 20 replicates of an analyte free sample.

METHODS COMPARISON

Patient serum samples were used to compare this IgM assay on the AU2700 against another commercially available IgM assay. Results of linear regression analysis were as follows:

y = 1.006x + 0.028	r = 1.000	n = 107	Sample range = 0.22 – 4.67 g/L

PRECISION

The following data was obtained on an AU640 analyser using 3 serum pools analysed over 10 days.

n = 80	Within-run		Total	
Mean g/L	**SD**	**CV%**	**SD**	**CV%**
0.48	0.01	1.69	0.02	3.44
1.14	0.02	1.36	0.04	3.29
2.17	0.05	2.19	0.09	4.08

ADDITIONAL INFORMATION

DxC 700 AU requires that each reagent application has a standard format of abbreviated Closed Test Name. This Closed Test Name is required to allow automated loading of the calibrator information for each application as part of the DxC 700 AU Closed System. Refer to the table below for the Closed Test Name assigned to each application for this assay.

Test Name	Description
IGM1G	Immunoglobulin M (Serum)
IGM1GP	Immunoglobulin M (Serum Paediatric)

Setting Sheet Footnotes
User defined

† Beckman Coulter Serum Protein Multi-Calibrator Cat. No: ODR3021

* Values set for working in SI units (g/L). To work in mg/dL multiply by 100.

REVISION HISTORY

IFU updated to add Vietnamese language.

Revised GHS section

Updated Additional Information section

Preceding version revision history

DxC 700 AU updates

Removed For RX use only statement

Updated Warning and Precautions section

Updated Calibration section

REFERENCES

1. Thomas L. Immunoglobulins (Ig). In: Thomas L, ed. Clinical laboratory diagnostics. Use and assessment of clinical laboratory results. Frankfurt/Main: TH-Books Verlagsgesellschaft, 1998:667-678.

2. Tietz NW, ed. Clinical guide to laboratory tests, 3rd ed. Philadelphia: WB Saunders Company,1995:360-363.

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4. Ehret W, Heil W, Schmitt Y, Töpfer G, Wisser H, Zawta B, et al. Use of anticoagulants in diagnostic laboratory investigations and stability of blood, plasma and serum samples. WHO/DIL/LAB/99.1 Rev.2:35pp.

5. Baudner S, Dati F. Standardization of the measurement of 14 proteins in human serum based on the new IFCC/BCR/CAP international reference material CRM 470. Lab Med 1996;20:145-152.

6. Painter PC, Cope JY, Smith JL. Reference information for the clinical laboratory. In: Burtis CA, Ashwood ER, eds. Tietz textbook of clinical chemistry. Philadelphia:WB Saunders Company, 1999;1820pp.

7. Young DS. Effects of drugs on clinical laboratory tests, 5thed. AACC Press, 2000.

EC REP Beckman Coulter Ireland Inc., Lismeehan, O'Callaghan's Mills Co. Clare, Ireland (001) 703-527-3887

Beckman Coulter, Inc., 250 S. Kraemer Blvd., Brea, CA 92821 U.S.A.