IgM

OSR61173	**4 x 14 mL**	**R1**
	4 x 11 mL	**R2**

Intended Use
System reagent for the quantitative determination of IgM immunoglobulins in human serum and plasma on Beckman Coulter AU analyzers.

Summary
The spectrum of abnormalities in serum immunoglobulin concentrations is broad. Abnormal concentrations range from a virtual absence of one or more of the three major classes of immunoglobulin (IgG, IgA and IgM) to polyclonal increases in one or more immunoglobulins. Measurement of these immunoglobulins aids in the diagnosis of abnormal protein metabolism and the body's lack of ability to resist infectious agents.

Methodology
Immune complexes formed in solution scatter light in proportion to their size, shape and concentration. Turbidimeters measure the reduction of incidence light due to reflection, absorption or scatter.

In the procedure, the decrease in intensity of light transmitted (increase in absorbance) through particles suspended in solution is the result of complexes formed during the antigen-antibody reaction.

System Information
For AU400/400^{e}/480, AU600/640/640^{e}/680 and AU2700/5400 Beckman Coulter Analyzers**.**

Reagents
Final concentration of reactive ingredients:

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

Also contains preservatives.

Precautions
1. For *in vitro* diagnostic use.
2. Do not ingest. Harmful if swallowed.
3. Contains sodium azide as a preservative which may react with lead joints in copper plumbing to form explosive compounds. Even though the reagent contains minute quantities of sodium azide, drains should be well flushed with water when discarding the reagent.

Preparation of Reagents
The IgM reagent is ready for use. No preparation is required.

Storage and Stability
1. The unopened reagents are stable until the expiration date printed on the label when stored at 2 – 8°C.
2. Opened reagents are stable for 90 days when stored in the refrigerated compartment of the analyzer.

Indications of Deterioration
Visible signs of microbial growth, turbidity or precipitate, or any change in reagent color may indicate degradation and warrant discontinuance of use.

Specimen Collection and Preparation
Serum, EDTA and Lithium heparin plasma may be used.
Fasting serum specimen, free from hemolysis, is the recommended specimen.
Avoid highly lipemic samples, which may produce excessively high scatter signals.[1]

Sample Storage and Stability
Serum specimens are stable at 2 – 8°C for up to 3 days or at ≤ -20°C for longer periods of time.[1]

Interfering Substances
Results of studies[2] show that the following substances interfere with this IgM procedure.

The criteria for no significant interference is recovery within 10% of the initial value.

Bilirubin:	No significant interference up to 40 mg/dL Bilirubin
Hemolysis:	No significant interference up to 500 mg/dL Hemolysate
Lipemia:	No significant interference up to 200 mg/dL Intralipid*

* Intralipid, manufactured by KabiVitrium Inc., is a 20% IV fat emulsion used to emulate extremely turbid samples.

The information presented is based on results from Beckman Coulter studies and is current at the date of publication. Beckman Coulter Inc. makes no representation about the completeness or accuracy of results generated by future studies. For further information on interfering substances, refer to Young[3] for a compilation of reported interferences with this test.

Procedure
A complete list of test parameters and operational procedure can be found in the User's Guide appropriate to the analyzer.

Materials Provided
IgM Reagent

Materials Required But Not Provided
Serum Protein Multi-Calibrator (Cat # ODR3021)

IgM

Stability of Final Reaction Mixture
The Beckman Coulter AU analyzer automatically computes every determination at the same time interval.

Calibration
The frequency of calibration for the IgM procedure is every 90 days. Calibration of this IgM procedure is accomplished by use of the Serum Protein Multi-Calibrator (Cat # ODR3021), which is traceable to the International Reference Preparation ERM® – DA470 (US designation RPPHS lot 91/0619) standard**.**

Recalibration of this test is required when any of these conditions exist:
1. A reagent lot number has changed or there is an observed shift in control values.
2. Major preventative maintenance was performed on the analyzer.
3. A critical part was replaced.

Quality Control
During operation of the Beckman Coulter AU analyzer, at least two levels of an appropriate Immunology control material should be tested a minimum of once a day. In addition, these controls should be performed after calibration, with each new lot of reagent, and after specific maintenance or troubleshooting steps described in the appropriate User's Guide. Quality control testing should be performed in accordance with regulatory requirements and each laboratory's standard procedure.

Results
Results are automatically printed out for each sample in mg/dL. For S.I. units (g/L) the results must be multiplied by 0.01.

Dynamic Range

This IgM procedure is linear from 20 mg/dL to 500 mg/dL. Samples exceeding the upper limit of linearity should be diluted and repeated. The sample may be diluted, repeated and multiplied by the dilution factor automatically utilizing the AUTO REPEAT RUN.
A prozone effect has been observed with abnormally high IgM specimens. Certain abnormal samples, such as those from myeloma patients, may give abnormally low or normal results due to the slow reaction of the abnormal protein with the antibody. Specimens suspected as such should be diluted and retested.
Samples with very high IgM concentrations (> 10,000 mg/dL polyclonal) can generate false low results without appropriate "Z" flags due to excess antigen in the sample.

Expected Values

Adults[4] 45 – 281 mg/dL

Expected values may vary with age, sex, diet and geographical location. Each laboratory should determine its own expected values as dictated by good laboratory practice.

Specific Performance Characteristics

The following data was obtained using the IgM reagent on Beckman Coulter AU analyzers according to established procedures. Results obtained in individual laboratories may differ.

Limit of Quantitation
The Limit of Quantitation (LOQ) for the IgM assay was determined to be less than 20 mg/dL using a within laboratory CV of 20%. This was determined using a method based on the CLSI protocol EP17A.[5]

Precision[7]
Estimates of precision, based on CLSI recommendations[6] are consistent with typical performance. The repeatability (within run precision) is less than 4.2% CV and the within laboratory (total) precision is less than 10% CV. Assays of serum pools and control sera were performed and the data reduced following CLSI guidelines above.

N = 80	Repeatability (Within Run)		Within Laboratory (Total)	
Mean, mg/dL	SD	CV%	SD	CV%
48	1	1.69	2	3.44
114	2	1.36	4	3.29
217	5	2.19	9	4.08

Method Comparison[7]
Patient samples were used to compare this IgM Reagent. The table below demonstrates representative performance on AU analyzers.

Y Method	AU640/640[e]
X Method	AU2700/5400/680
Slope	1.02
Intercept	-2.3
Correlation Coeff. (r)	0.999
No. of Samples (n)	108
Range (mg/dL)	21 – 468

References

1. Rose, N.R., Friedman, H, and Fahey, J.L. Manual of Clinical Laboratory Immunology, 3rd Edition, American Society for Microbiology, Washington, DC, 1986.
2. CLSI/NCCLS, Interference Testing in Clinical Chemistry, EP7-A2, 2004.
3. Young, D.S., Effects of Drugs on Clinical Laboratory Tests, 5th Edition, AACC Press, 2000.
4. Beckman Coulter Inc. data on samples collected from 200 blood donors in North Texas.
5. CLSI/NCCLS, Determination of Limits of Detection and Limits of Quantitation, EP17-A 2004.
6. CLSI/NCCLS, Evaluation of Precision Performance of Quantitative Measurement Methods, EP5-A2, 2004.
7. Data is on file for specific AU analyzers.

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