MICROALBUMIN II

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

Ref No	Package	Ref No	Package	Ref No	Package	Ref No	Package
A2296	125 mL	LB285	200 mL	LMA72	200 mL	MMA73	250 mL
BB140	200 mL	LMA71	200 mL	LM072	80 mL	M3A71	200 mL
DMM70	283,5 mL			MMA70	250 mL	S2420	125 mL
						TMA71	250 mL

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

INTENDED USE

The test is applied for the quantitative determination of albumin concentration in urine.

GENERAL INFORMATION

Microalbuminuria indicates slightly elevated urinary albumin excretion. In most cases, microalbuminuria is of glomerular origin and indicates initial glomerulosclerosis. Microalbuminuria has a high predictive value for nephropathy in insulin-dependent diabetes subjects and for premature mortality due to cardiovascular disease in non-insulin-dependent diabetes subjects and in the general population. All cardiovascular risk factors can be determinants for microalbuminuria constitution, especially the genetic determinants of these risk factors. Thus, microalbuminuria can be an indicator to summarize renal or cardiovascular risk, or both, in various populations.[1]

Early detection of glomerular damage, while it is minimal and reversible, is extremely important. For both Type I and Type II diabetes mellitus, monitoring urinary microalbumin is an important component of treatment.[2]

TEST PRINCIPLE

Turbidimetric method

Albumin in the urine sample causes agglutination of the latex particles coated with anti-human albumin. The agglutination of the particles is proportional to the albumin concentration and can be measured turbidimetrically.

REAGENT COMPONENTS

Reagent 1:

Borate buffer	≤ 0.12 mol/L,
Sodium azide	≤ %0.1

Reagent 2:

Latex particles coated with anti-human albumin antibodies

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

Urine is collected by standard procedures. Urine should be centrifuged before analysis. Random, timed or 24-hour urine samples should be collected in clean sample collection containers containing preservatives.

Stability of albumin in urine[4]:
14 days at 2-8ºC
5 months at -20ºC

CALIBRATION AND QUALITY CONTROL

Calibration: The assay requires the use of an Microalbumin Calibrator.

Microalbumin Calibrator
Ref.No: MACL4
Ref.No: MACL5 (For Erba)

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:

Microalbumin Control Level I
Ref.No: MACN1
Ref.No: MACN3 (For Erba)

Microalbumin Control Level II
Ref.No: MACN2
Ref.No: MACN4 (For Erba)

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

Expected Values:

	Random urine[a] Microalbumin:Creatinine (µg/mg) or (mg/g)	24-hour urine[b] (mg/24 hour)	Timed urine[c] (µg/minutes)
Normal	< 30	< 30	< 20
Microalbuminuria	30-299	30-299	20-199
Macroalbuminuria	≥ 300	≥ 300	≥ 200

a. Random urine= (microalbumin(µg/mL) ÷ creatinine urine (mg/dL)) × $\frac{100\ mL}{dL}$ or
Random urine = (microalbumin (mg/L) ÷ creatinine urine (mmol/L)

b. 24-hour urine = (microalbumin (µg/mL) × volume (mL) ÷$\frac{1000\ \mu g}{mg}$

c. Timed urine = (microalbumin (µg/mL) × volume(mL) ÷ time (minute)

According to the American Diabetes Association (ADA) microalbumin levels can be measured from 24-hour, timed, or random urine specimens. Normal albumin levels, microalbuminuria, and macro albuminuria levels for each specimen type are listed below.[5,6]

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.[7]

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).[8]

The determined analytic measuring interval for Microalbumin is 2 -270 µg/mL.

Detection Capability

Limit of Detection (LoD): 1 µg/mL

Limit of Quantitation (LoQ): 2 µg/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.[9]

Linearity

This method shows measurement linearity in the activities up to 270 µg/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.[10]

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.[14]

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

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

Mean Concentration	SD*	CV%	n
13 µg/mL	0.16	1.21	80
34 µg/mL	0.66	1.94	80

*SD: Standard Deviation

Note: This working system has been named "Within-Run Precision" in the previous CLSI - EP05-A2 manual.[15]

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

Mean Concentration	SD	CV%	n
13 µg/mL	0.46	3.53	80
34 µg/mL	0.95	2.78	80

Note: This working system has been named "Total Precision" in the previous CLSI - EP05-A2 manual.[15]

Prozone

No prozone effect has been observed up to 700 µg/mL value which is tested for microalbumin.

Interference

Endogenous interferant and analyte concentrations that have been used in the Microalbumin 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 microalbumin interference scanning test is appropriate, is determined as ±10%.[13]

In microalbumin test results, no significant interaction has been observed in the determined endogenous interferant and analyte concentrations or between interferants and analyte. Due to the interference with hemolyzed samples is high, such samples should be rejected for microalbumin testing.

Hemoglobin	: ≤ 1.0 g/L
Bilirubin	: ≤ 20 mg/dL

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.

Disposal

P501	:Dispose the vials and contents according to the local regulations.

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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