INTENDED USE
MEDICON β₂M Microglobulin is a set of immunoturbidimetric reagents for the quantitative determination of β₂M in human serum, plasma, and urine, with BECKMAN COULTER AU400/600/800/VD640/2700i/5400 and other discrete analyzers. For in vitro diagnostic use only.

CLINICAL SIGNIFICANCE
β₂M microglobulin (β₂M) is a cell surface protein and comprises the most valuable marker for the diagnosis of myeloma. Concentrations < 4 mg/L suggest the least bad form of myeloma, while concentrations > 20 mg/L are the worst. Also, elevated levels appear during inflammation of all types, autoimmune disorders, viral infections (AIDS, CMV) and renal disorders (uremia). The use of measurement of urine β₂M levels as an assessment of renal clearance is complicated by the fact that β₂M degrades rapidly at pH < 6, so the test has diagnostic value only when the patient has first been prepared for the production of alkaline urine.

METHOD PRINCIPLE
The method followed is immunoturbidimetric. When the sample is mixed with the appropriate buffer (R1) and latex particles coated with anti-human β₂M (R2), β₂M microglobulin reacts with antibodies leading to agglutination of latex particles. This agglutination is detected as turbidity change (600 nm) and it is proportional to β₂M microglobulin concentration in the sample.

METHOD LIMITATIONS
Refer to the book "Effects of Preanalytical Variables on Clinical Laboratory Tests" for possible interference of other agents is described in the "Clinical Guide to Laboratory Tests".

The reagent is designed for in vitro diagnostic use only. In vitro diagnostic reagents can be hazardous. They should be handled according to good laboratory practices and techniques. Avoid inhalation and contact with eyes and skin.

REAGENT COMPOSITION
Reagent 1 (R1)
Polyethylene glycol in Tris Buffer (pH 8.2).
Non-reactant components and preservative.

Reagent 2 (R2)
Tris Buffer (pH 8.4)
Latex covered rabbit and β₂-microglobulin antibodies.
Non-reactant components and preservative.

WARNINGS – PRECAUTIONS
● This reagent is designed for in vitro diagnostic use only. In vitro diagnostic reagents can be hazardous. They should be handled according to good laboratory practices and techniques. Avoid inhalation and contact with eyes and skin.
● Samples should be considered as potentially infectious. Handle according to the universal precautions and good laboratory practices.
● Antiseira are raised in clinically healthy animals in monitored facilities under constant surveillance.
● The reagent contains sodium azide (NaN₃ < 0.1%). Avoid swallowing and contact of the reagent with skin and mucous membrane.
● Dispose all waste according to national laws.
● MSDS is available by MEDICON upon request.

PREPARATION
Reagent 1 and 2 are ready to use and placed on the corresponding places on the analyzer. Shake R2 well before the first use, to mix contents well. Vials bear barcode for recognition by BECKMAN COULTER AU Series analyzers.

REAGENT DETERIORATION
The reagent should not be used:
● When it does not exhibit the specified linearity or recovery of control values lies outside acceptable range after recalibration.
● After prolonged exposure to sunlight or high temperatures.

SHELF LIFE
Unopened, reagents are stable up to the stated expiry date when stored at 2 – 8°C. Once opened, they can be stored refrigerated on the instrument for 2 months.

SAMPLE
Use serum and urine as specimen. Analyse the sample when it is fresh or store it at 2 – 8°C for less than 72 hours. Samples are stable at serum at -20°C for 6 months and at -70°C for a bigger period. Strongly lipemic samples should be avoided.

Urine: 24 hours sample. Centrifuge the specimen and fix the pH at 7.0. Analyze the specimen when it is fresh.

Sample remains stable at -20°C for 1 year.

Samples must be considered dangerous (because of risk of infection) and should be handled with great care.

CALIBRATION
MEDICON β₂M Calibrator (1578-0860) traceable to NIBSC 1 International Standard 1985 for β₂M, or BECKMAN COULTER ODR3203 Serum Protein Multic calibrator 2 (MEDICON code: 4478-0802) can be used for calibration. Calibrate the assay every 2 weeks. Recalibrate following preventive maintenance or replacement of a critical part of the analyzer; when using a new reagent kit or a new reagent lot number, or when Quality Control results are out of range.

The operator should follow guidelines for use of calibrator as stated by the manufacturer.

QUALITY CONTROL
MEDICON provides the following products for quality control: Immunology Control levels 1.2.3 (1578-1195-04, 1578-1196-04, 1578-1197-04) or BECKMAN COULTER ODC0014 ITA Control Serum 1 (MEDICON code: 4478-1195), ODC0015 ITA Control Serum 2 (MEDICON code: 4478-1199), ODC0016 ITA Control Serum 3 (MEDICON code: 4478-1192).

Target values and limits should fall within acceptable intervals adjusted to the requirements of each laboratory. Results outside the specified values even after recalibration could be due to reagent deterioration, unusable storage conditions or control deterioration, instrument malfunction, or error during test procedure.

MATERIALS REQUIRED BUT NOT PROVIDED WITH THE KIT
B/M calibrator
Quality control material
Automated biochemistry analyzer
Common laboratory equipment

REFERENCE INTERVALS
Serum, plasma: 0.8 – 2.5 mg/L
Urine: < 1 mg/24 hours (0.2 mg/L)
Each laboratory should determine its own expected values as dictated by good laboratory practice.

WASTE DISPOSAL
This product contains sodium azide (NaN₃), which forms sensitive explosive compounds with copper or lead. Flush waste pipes with water after the disposal of unlabeled reagent in order to avoid azide build up in the drain pipes.

SPECIFIC PERFORMANCE CHARACTERISTICS
Linearity
The assay is linear within measuring range 0.15 – 20 mg/L. When values exceed this range samples should be diluted accordingly.

Prozone Tolerance
No hook effect is observed up to 150 mg/L

Sensitivity
The lowest detectable level of β₂M is estimated at 0.10 mg/L for serum and 0.11 mg/L for urine. The lowest detection limit (DL) is defined as the lowest concentration of analyte that is distinguishable from zero. A sample free of analyte is assayed 20 times within the assay and the DL is calculated as the absolute mean plus three standard deviations.

Precision

<table>
<thead>
<tr>
<th>Level (mg/L)</th>
<th>Within Run CV%</th>
<th>Total CV%</th>
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</thead>
<tbody>
<tr>
<td>1.02</td>
<td>2.03</td>
<td>4.22</td>
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<tr>
<td>2.81</td>
<td>1.22</td>
<td>1.86</td>
</tr>
<tr>
<td>5.21</td>
<td>0.94</td>
<td>1.69</td>
</tr>
</tbody>
</table>

Precision is estimated on two concentration levels of analyte according to NCCLS protocol EP-5T (20 consecutive days, 2 runs per day, 2 repeats per run).

Interference

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Lipemic:</th>
<th>insignificant up to Intralipid® 1000 mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>insignificant up to 500 mg/dL</td>
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<tr>
<td></td>
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<td></td>
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<td>insignificant up to 100 U/mL</td>
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<tr>
<td>Osmolality</td>
<td>Manufacturer:</td>
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<tr>
<td></td>
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<td>insignificant up to 2 g/L</td>
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<tr>
<td>Albumin</td>
<td>Manufacturer:</td>
<td>insignificant up to 20 g/L</td>
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Method Comparison
A comparison was performed between this reagent and another commercially available product. The results are as follows:

<table>
<thead>
<tr>
<th>Serum</th>
<th>R₀=0.9681 N=64</th>
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<tbody>
<tr>
<td></td>
<td>R=0.9484 N=43</td>
</tr>
<tr>
<td>Urine</td>
<td>R₀=0.9953 N=11</td>
</tr>
<tr>
<td></td>
<td>R=0.9815 N=20</td>
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<tr>
<td></td>
<td>R=0.7786 + 0.2778 R₀=0.9981 N=15</td>
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</tbody>
</table>

BIBLIOGRAPHY

SYMBOLS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>β₂M</td>
<td>Microglobulin</td>
</tr>
<tr>
<td>Β₂M</td>
<td>Microglobulin</td>
</tr>
<tr>
<td>β₂M</td>
<td>Microglobulin</td>
</tr>
</tbody>
</table>

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