The microbiological analysis of urine samples for urinary tract infections (UTI) accounts for between 30-65% of routine laboratory workload.

Traditionally, a combination of microscopy and bacterial culture is employed for the detection and identification of pathogenic bacteria, with bacterial counts of $\geq 10^5$ cfu/ml from urine cultures considered indicative of infection.$^1$

Such sample processing exerts significant pressure on resources in terms of reporting time, consumable cost and availability of staff, especially as a substantial proportion of samples report as negative.

The Mast Uri® System comprises a suite of instrumentation, software and innovatively presented reagents, providing a streamlined and economical alternative to established methodologies.

Utilising multipoint technology, Mast Uri® System will detect and quantify the presence of pathogenic bacteria by extrapolating the colony count from an inoculum of up to 1µl of urine (Table 1) based on the calculations of Kerfoot et al.$^{2,3}$

<table>
<thead>
<tr>
<th>Bacterial Confluence</th>
<th>CFU count/ 0.3µl Inoculum</th>
<th>CFU count/1µl inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^3$ cfu/ml</td>
<td>-</td>
<td>1 - 9</td>
</tr>
<tr>
<td>$10^4$ cfu/ml</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>$10^5$ cfu/ml</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Guidance on Assessing Colony Count

As a result, direct antibiotic susceptibility testing can be performed by breakpoint methodology, with resistance and sensitivity indicated as growth/no growth when compared to both negative (un-inoculated plate) and positive (inoculated plate containing no antibiotic) controls.

Similarly, bacterial identification is determined by inoculation onto a selection of biochemical test substrates.

Using a 96-well plate format for pre-poured antibiotic susceptibility and identification media enables the Mast Uri® System to deliver results showing significant/non-significant growth, antibiogram, bacterial identification and detection of mixed cultures within 24 hours.

Sample preparation and dispensing are critical aspects of the urine screening process.

The Mast Uri® Well is a dispensing aid which minimises sample preparation error. Individual green LED lights, in a 96-well template, automatically indicate the correct well for each sample.

A scan of the specimen barcode will illuminate one of the 96 LED’s, indicating the appropriate well for the sample to be dispensed.

This process is repeated until all the samples have been transferred to the 96-well plate, which becomes the inoculum plate for subsequent inoculation of the Mast Uri® Plate Set(s).

An inoculum plate containing 96 samples may be confidently prepared within 15 minutes.

**Specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>0.61Kg</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(W x D x H)</td>
</tr>
<tr>
<td></td>
<td>100mm x 270mm x 200mm</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>5V, 500mA via USB connection</td>
</tr>
<tr>
<td>Connectivity</td>
<td>USB</td>
</tr>
</tbody>
</table>
A range of biochemical, antibiotic and control media for bacterial identification and antibiotic sensitivity analysis to EUCAST standards.

Plate sets are customised to suit individual laboratory requirements.
Mast Uri® Plus is a laboratory analyser that automates the reading and analysis of Mast Uri® Plates to generate identification and antibiotic susceptibility results.

Order code: SCANURIPLUS

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>22.5Kg</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(W x D x H) 525mm x 525mm x 680mm</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>DC input 12V, 5A from AC adaptor with Mains Input 100-240V, AC, 50/60Hz, 1.5A</td>
</tr>
<tr>
<td>Connectivity</td>
<td>2 x USB (Camera &amp; Control)</td>
</tr>
</tbody>
</table>

1. Mast Uri® Plate is scanned and placed on Mast Uri® Plus turntable.
2. Touch the Sensor.
3. During reading, the status of the instrument is indicated by a colour change in the sensor.
4. Each plate, delivering 96 results, can be read in approx 30 secs, meaning an average 10-plate set containing a mixture of antibiotic and identification plates can be captured and recorded in ≤5 mins.
5. Integrated EUCAST expert rules are automatically applied. Results for a plate set are viewed, validated and reported within 20 minutes by users holding supervisor status. Reports are generated and the results sent back to the LIMS for reporting.
6. Integrated EUCAST expert rules are automatically applied. Results for a plate set are viewed, validated and reported within 20 minutes by users holding supervisor status. Reports are generated and the results sent back to the LIMS for reporting.
**Simple**

**Intuitive Software**
- Visual prompts and easy to use menu screens guide the user through processing of patient samples
- Sample data can be created manually or imported via LIMS
- System generated error messages will identify discrepant samples

**Efficient**

**Rapid Reporting**
- Identification and susceptibility results for >95% of all urine samples can be reported within 24 hours

**Scaleable**
- Can process over 200 specimens per hour

**Effective**

**Confidence in Results**
- Inclusion of positive and negative control plates provide comparative reference samples for determination of antibiotic sensitivity, overcoming the need for a standardised inoculum

**Full Audit Trail**
- Access privileges may be assigned to individual members of staff. This allows full audit tracking and validation to be performed by appropriately qualified staff
- Plate images are permanently stored providing additional audit evidence

**Sample Tracking**
- All plates are bar-coded, allowing for sample tracking and audit validation

**Interface**
- Bi-directional interface allows the import of specimen work lists, patient demographics and microscopy results (where appropriate). Validated results are exported to the LIMS for reporting, thus eliminating transcription errors

**Waste Reduction**
- The transition from traditional agar petri dishes to proprietary 96-well format Mast Uri® Plates represents a substantial drop in requirement for laboratory plastics, hazardous waste disposal and cost
- Smaller footprint for Mast Uri® Plates frees up significant refrigerator and incubator space

**Expert Rules**
- The system incorporates current EUCAST expert rules to allow reliable reporting of intrinsic resistances and exceptional phenotypes. These can easily be supplemented by user-defined rules

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