Same Day Strain Typing
For Real Time Investigations

diversilab™
Strain typing
Same Day Strain Typing
For Real Time Investigations

Uncovering hidden reservoirs of resistance
Automated Analysis with Intuitive Software Design

The DiversiLab® Software helps with every step in the process including worksheet generation, Quality Assurance and data management. The software is fully web-based and users can log into their secure website to access results. The software provides multiple tools for viewing reports, including a dendrogram, similarity matrix and graph overlay. DiversiLab reports are in an easy-to-read, interactive format for easy data interpretation.

**Interactive Tab**

- The similarity matrix displays and color codes the percentage similarity of each sample pair. By clicking on the intersection of two isolates, a graph overlay will appear which lets users examine the different banding patterns of two isolates.
- The dendrogram can be expanded or collapsed by clicking any yellow node.
- The percentage similarity is displayed by hovering the mouse over any vertical branch point of the dendrogram.

**Overlays of sample graphs show small differences between samples that are otherwise not apparent on virtual-gel images.**

**Scatter Plot**

Displays a two-dimensional representation of relative sample similarity in which samples that are close to each other have a higher level of similarity than those that are farther apart. The Scatter Plot shows a “birds-eye-view” of sample clustering. Scatter plots help investigators quickly determine the clustering of organisms from the dataset.
DiversiLab® Libraries

The DiversiLab System provides flexible software that allows you to store and arrange your fingerprint patterns into institution specific libraries or compare fingerprint patterns to validated libraries of organisms.

User Libraries
Users have the ability to easily create their own libraries, using parameters of their choice. Institution specific libraries can be created:

- Which are organism or location specific
- To conduct long term studies
- To track seasonal outbreaks from year to year

Pre-existing DiversiLab Libraries
The DiversiLab Software comes with pre-validated libraries, which allow you to rapidly discriminate between closely related bacterial or fungal species and strains. These libraries are provided free of charge and are updated periodically.

**MRSA**
Help determine if your MRSA is hospital acquired vs. community acquired by comparing your MRSA rep-PCR fingerprint to characterize against known MRSA USA PFGE-types.

**Mycobacterium**
Use the Mycobacterium library to distinguish among traditionally hard-to-characterize species such as: *M. chelonae* from *M. abscessus*, *M. avium* from *M. intercellulare*, *M. tuberculosis* from *M. bovis*, and others.

**Molds**
Use the mold library to distinguish dimorphic fungi, *Dermatophytes*, *Zygomycetes*, *Aspergillus* and *Fusarium*.

**Clostridium**
Compare your *Clostridium difficile* isolates to virulent epidemic strains such as PFGE-type NAP-1.

**Candida**
Use the *Candida* library to differentiate between different strains of *Candida*.

**E. coli**
The *E. coli* Library contains the *Escherichia coli* Reference Collection (ECOR) plus other organisms with pathogenicity or serotype information such as EHEC(O157:H7).

**Salmonella**
Used for the characterization of *Salmonella* serotypes and strain-level discrimination among *Salmonella enterica* isolates. The complete *Salmonella* library is comprised of 313 entries: 309 *Salmonella enterica* subspecies enterica isolates and four *Salmonella enterica* subspecies arizonae isolates.
**DiversiLab® Fingerprinting Kits**

**Gram Positive**
- Enterococcus
- Staphylococcus*
- Streptococcus
- Bacillus
- Bifidobacterium
- Clostridium*
- C.perfringens
- Lactobacillus
- Listeria

**Gram Negative**
- Acinetobacter
- Archea
- Campylobacter
- Enterobacter
- Escherichia*
- Francisella
- Klebsiella
- Listeria
- Pseudomonas
- Salmonella*
- Serratia

**Miscellaneous**
- Mycobacterium*
- M. tuberculosis
- Mycoplasma
- Propionibacterium

**Fungal**
- Aspergillus
- Candida*
- Fungal*
- Saccharomyces

**Bacterial (multiple genus & species for both gram Pos and Neg organisms)**
- Burkholderia & Stenotrophomonas ran on the Bacterial Kit. Shigella ran on Bacterial or Escherichia kits.

* Pre-validated libraries, which allow you to rapidly discriminate between closely related bacterial or fungal species and strains.

Contact your local bioMérieux representative for more details and product availability.

Call 800-682-2666 or Visit www.biomerieux-usa.com/diversilab
With mandatory reporting and denial of payment for Healthcare Acquired Infections (HAIs) on the horizon, hospitals are scrutinizing their Infection Control Programs and Outbreak Response Plans. In epidemiological investigations, same-day, accurate strain typing results are required to track the source and spread of infections.

“The hospital epidemiologist should initiate strain typing studies in consultation with the hospital infection control laboratory or the hospital microbiology staff when investigating a potential outbreak of an infectious disease.” (5)

Automated Strain Typing

DiversiLab® is an automated platform utilizing rep-PCR technology that provides standardized, highly reproducible DNA fingerprinting of bacterial and fungal samples for complete isolate characterization. It rapidly and accurately distinguishes isolates to strain level. With DiversiLab technology, strain typing becomes much easier and possible in routine use, even with numerous specimens.

Intra- and Inter-laboratory reproducibility are key to accurately track contaminants. The DiversiLab platform has been shown to have:

- <1% variability for inter-laboratory reproducibility. (6)
- <2% variability or intra-laboratory reproducibility. (6)

Same day strain typing for real time investigations

<table>
<thead>
<tr>
<th>Time</th>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 min</td>
<td>DNA Extraction</td>
<td>Extract DNA from isolated cultures</td>
</tr>
<tr>
<td>2 hours</td>
<td>rep-PCR Amp.</td>
<td>Amplify samples using rep-PCR and the appropriate DiversiLab DNA Fingerprinting Kit</td>
</tr>
<tr>
<td>1 hour</td>
<td>Detection</td>
<td>Fragments are separated via electrophoresis performed in a microfluidics DNA LabChip (1 to 13 reactions/chip run)</td>
</tr>
<tr>
<td>10 min</td>
<td>Data Analysis</td>
<td>Real-time analysis and reports accessible via an individual secured website</td>
</tr>
</tbody>
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*rep-PCR: amplification of noncoding repetitive sequences interspersed throughout the bacterial genome using Polymerase Chain Reaction (PCR).
Advanced Technology to Address Today’s Challenges of Health Care Associated Infections (HAIs)

**Transparency**
State and Federal legislation for mandatory reporting are driving hospitals to reduce HAIs to increase patient safety and quality of care.

**Profitability**
Medicare begins reduced payment for HAIs starting October of 2008 \(^{(1)}\).
HAIs reduce inpatient margins by an average of $5,018 \(^{(2)}\).
MRSA HAIs are estimated to cost an average of $35,000 and increase Length of Stay by up to 10 days \(^{(3)}\).

**Strain typing helps reduce HAIs**
Studies indicate that incorporating a strain-typing program in your institution reduces your HAI rate by up to 23% \(^{(4)}\).

**Need for rapid strain typing**
Rapid results are required to help Infection Control Practitioners locate the source of microbial outbreaks quickly.

The DiversiLab® System provides same day strain typing for real-time epidemiological investigations. The highly reproducible fingerprint patterns can be stored to facilitate historical tracking and help uncover hidden reservoirs of resistance.

As part of a comprehensive Infection Control program, the DiversiLab System will help track the source and spread of microbial infections and contamination more quickly, more accurately, and more cost-effectively than any other solution on the market.

### Hospital Acquired MRSA
- Average cost of $35,000
- Adds up to 10 days LOS
- Increased Morbidity
- Increased Mortality

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\(^{(2)}\) HAIs reduce inpatient margins by an average of $5,018.

\(^{(3)}\) MRSA HAIs are estimated to cost an average of $35,000 and increase Length of Stay by up to 10 days.

\(^{(4)}\) Studies indicate that incorporating a strain-typing program in your institution reduces your HAI rate by up to 23%.
References:

1) Centers for Medicare and Medicaid Services, found at http://www.cms.hhs.gov/HospitalAcqCond.


3) Association for Professionals In Infection Control and Epidemiology, Methicillin Resistant Staphylococcus Aureus Backgrounder, found at: http://www.apic.org/Content/NavigationMenu/ResearchFoundation/NationalMRSAPrevalenceStudy/MRSABackgrounder.pdf.


