



Wyoming's Lab Loop

A Publication of the Wyoming Public Health Laboratory Volume 1, Issue 1 Summer 2004

New WPHL Newsletter: Focus on Service

Wyoming's Lab Loop is an example of a growing awareness of the need to link Public Health Laboratory activities with our community partners. Through this publication we hope to provide information relevant to the day-to-day activities of community laboratories around the state and increase the cooperative interactions of Wyoming's Laboratory Response Network. Please help us make this publication a valuable resource for you, feel free to provide input, comments, suggestions for articles and contributors.

Richard Harris, Ph.D.,

Sequencing: The Future of Bacterial Identification

Traditionally, the microbiologist has used colony morphology, Gram stain, nutritional requirements, and biochemical reactions to identify bacteria from clinical specimens. Identification systems that depend on these phenotypic expressions are limited in that they are designed for non-fastidious rapidly growing bacteria. Drawbacks to these systems are that they cannot be used with non-viable organisms, identification of slow-growers is both difficult and time-consuming, and with the emergence of

unusual opportunistic pathogens isolates often exhibit biochemical characteristics that do not fit



Sequencing Instruments

into known genus and species patterns. Identification systems that rely on genotypic characteristics are frequently able to identify isolates when the more traditional systems fail. Sequencing of the bacterial genome is a rapid,

efficient means to identify these difficult isolates. The bacterial **16S** ribosomal RNA gene is highly conserved within a species and among species of the same genus,



Sequencer

and hence can be used as the new "gold standard" for identification of bacteria to the species level. Publications in the Journal of Clinical Micro-

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BT Update: Community Lab Grant Project

We are proud to report that the BT Laboratory Program Community Grants Project is a great success!! The CDC Bioterrorism Preparedness Grant and the Health Resources and Services Administration Grant (HRSA) underwrote the funding of over \$465,000 in grants for capacity and capability

enhancements in 30 community laboratories from 22 counties throughout the state. The great majority of participating laboratories utilized the funds provided through the grant project to build capacity in the grant goal areas of safety for laboratories and personnel (60%), laboratory staff training

and education (87%), and laboratory equipment enhancement (83%) or communication and information technology resources (60%). Recipient laboratories will be receiving simple, easy to complete paperwork related to progress reporting in late August. Based on the success of

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Personal Protective Equipment (PPE) isn't what it used to be!

BT Community Lab Grant Project (cont'd)

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this first phase we are optimistic that we will receive approval for phase two of this project, which will focus on building an even stronger state laboratory network through goals designed to enhance workforce development, communication systems, and increased first responder activities. A state-wide teleconference will be held this Fall to get input from laboratories across the state and to provide information on the next phase of this grant process. Stay tuned, details to follow! At any time, should you need more information on this project please feel free to contact Angie 777-3735 or Sandy 421-2675.

BT Laboratory Capacity Building Grant Project

Total Dollars	\$465,000
# of Labs	30

Increased Capacity (% Labs)

Personnel & Lab Safety	60%
Education/Training	87%
Equipment & Instrumentation	83%
Computer Technology	60%

Wyoming's Lab Loop

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Molecular Epidemiology: Valuable Tool for Medical Facilities

Pulsed Field Gel Electrophoresis (PFGE) is a molecular technique used to determine the genetic relatedness within a single bacterial species. WPHL's microbiologist Wanda Manley is certified by Centers for Disease Control and Prevention (CDC) to perform PFGE protocols. PFGE is used by the WPHL to evaluate bacterial isolates suspected of being part of an outbreak or cluster of disease in the state or at a facility. Used primarily with food-borne bacterial pathogens PFGE is also useful in suspect nosocomial outbreak situations to determine if isolates from different patients or sources are related. For example, PFGE could provide valuable information on the relatedness of multiple isolates of a species of bacteria recovered from different

patients within a specific time period from a unit or floor of a medical facility. The relatedness of resistant organisms such as Methicillin resistant *Staphylococcus aureus* (MRSA) or Vancomycin resistant enterococci (VRE) often cannot be determined using susceptibility or biochemical patterns alone. Genetic fingerprinting techniques such as PFGE can provide additional information to support community laboratories during these types of outbreak investigations.

PFGE
GEL



PFGE software can compare gel patterns from any geographical region, within the state and nationally, and across any time period. However, PFGE is not always able to differentiate all bacterial

species since some are highly clonal; all isolates of a highly clonal species will have the same PFGE pattern.

How is PFGE done?

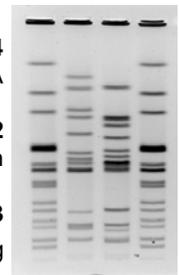
DNA is extracted from an isolate, digested with restriction enzymes that cleave the DNA at unique sequence regions on the DNA strand, and the cleaved strands are separated by size on a gel electrophoresis unit. An electrical current is pulsed between electrodes during the run to force the strands through the agarose. For more information on PFGE contact Wanda at 777-8680.

Sample PFGE Gel 1 2 3 4

LANES 1 & 4
Control DNA

LANE 2
S. Typhimurium

LANE 3
S. Heidelberg



Wanda with
PFGE
Instrument



Antibiograms—Guidelines From the Experts

WPHL's Bioterrorism Laboratory Program is providing a copy of NCCLS M39-A, *Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline*, for each Wyoming community clinical laboratory that does susceptibility testing. This document describes methods for the recording and

analysis of antimicrobial susceptibility test data, consisting of cumulative and ongoing summaries of susceptibility patterns of epidemiologically significant microorganisms. Any questions? Contact the WPHL BT Program.



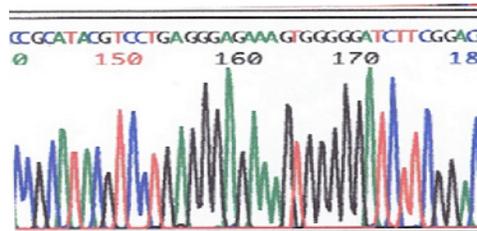
Favorite quote heard at Emerging Infectious Diseases Conference (ICEID) 2004:

“ Ordering a diagnostic laboratory test is like picking your nose in public...you better have a good plan for what you are going to do if you find something”

Sequencing: The Future of Bacterial ID (cont'd)

(Continued from page 1)

biology have demonstrated the usefulness of this technique for difficult to identify and rarely seen organisms. The WPHL uses the Applied Biosystems Avant 3100 sequencer with the MicroSeq 500 kit to sequence the first 500 base pair fragments of the **16S** rRNA gene which is compared to a data-



Segment of sequencer printout showing specific positioning of nucleotides on 16S rRNA gene

base of known sequences to obtain an identification. Occasionally additional confirmatory tests are performed if 2 species have identical sequences.

WPHL provides this specialized identification service to clinical laboratories in the state for no cost. Contact John Harrison at 777-6062 for more information.

BT Wet Workshops: Hands on Experience for Laboratorians

Many thanks to Nebraska's Bioterrorism Laboratory Program for including Wyoming laboratorians in their *Train the Trainer Wet Workshop*. Three Wyoming community laboratorians, Marty Hinkel (Worland), Gale Stevens (Torrington) and Deborah Pahl (Cheyenne) attended along with WPHL's Angie Van Houten, Sandy Novick and Linda Truitt. This workshop provided valuable hands-on training with 'mimic' organisms that look like those bacterial agents associ-

ated with bioterrorism. The participants unanimously agreed that this exposure to actively growing organisms in the wet lab is far superior to any textbook or lecture style training and is a must for bench techs who work in microbiology. The Wyoming participants are working together to provide this hands-on experience to all Wyoming laboratorians. Stay tuned for more information on an upcoming Wet Lab training planned for October 2004. For more information contact Angie 777-3735 or Sandy 421-2675.



Getting the Work Done: Workforce Issues for Labs

A symposium, sponsored by the Committee on Professional Affairs in Microbiology of the ASM Public and Scientific Affairs Board, focusing on current problems associated with staffing clinical laboratories is available on-line in web cast format. The four presentations cover topics of critical importance for the future of community laboratories. If you have had to deal with hiring and keeping qualified laboratorians or if you just wonder if you are getting paid enough you will want to check out the recent wage and vacancy survey done as a cooperative effort of ASM & ASCP. Or, perhaps you are interested in learning more about federal and state professional requirements for MLT and MT staff and exactly how much work someone is expected to do per shift. Survey results addressing staffing, workload, and productivity allowed different clinical laboratories to compare themselves with staffing levels in institutions of the same size and with similar extents of service. And, while no one can predict the future, the final presentation tries to provide incite into what clinical laboratories can expect as a changing workforce impacts traditional expectations of how a laboratory functions.

View & hear the webcast presentations at <http://www.asm.org/Policy/index.asp?bid=28422>



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Information Available in this Issue:

- National Job Trends for Lab Techs*
- Wet Lab Trainings planned for the fall*
- NCCLS M39A availability*
- Future Plans for BT Community Lab Grants in the works*
- Reference Testing Services at the WPHL*

What's Coming Up?

Event	Location	Date
IMSS	Jackson, WY	Sept 15-17
Joint WY-CO Annual Public Health Education Conference	Breckenridge, CO	Sept 27-29
WPHL Hands-On Training for 'Mimic' BT Agents	Sites to be determined	Tentative Date: October, 2004
Phase II of BT Community Lab Grants Project Statewide Tele-Conference	Call-in Via 800 phone number	Tentative Date: November, 2004

Check out our new
Web Page at:
[http://wdh.state.wy.us/
lab/index.asp](http://wdh.state.wy.us/lab/index.asp)



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