

Isolate Banking at NPHL

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The banking of clinical isolates for epidemiological purposes has been ongoing in Nebraska for many years. In 2006, 878 isolates were submitted to the NPHL for banking (**Table 1**). The main goal of the banking program at the NPHL is to allow further testing to aid in outbreak investigations and to monitor the drug resistance of specific organisms. The NPHL uses some of these organisms to participate in the National Antimicrobial Resistance Monitoring System (NARMS) Enteric Bacteria program, in collaboration with the Centers for Disease Control and Prevention (CDC), U.S. Food and Drug Administration (Center for Veterinary Medicine), U.S. Department of Agriculture (Food Safety and Inspection Service and Agricultural Research Services) and state health departments. NARMS data have been collected continually since 1996 to provide useful information about patterns of emerging resistance, which in turn can guide mitigation efforts. NARMS data is also used as an asset to outbreak investigations. Since antimicrobial use in food-producing animals may result in antimicrobial resistance which can be transmitted to humans through the food supply, antimicrobial resistance data from humans are important for the development of public health regulatory policy for the use of drugs in food-producing animals.

In addition to testing for antimicrobial susceptibility, many bacterial isolates are also tested for their potential association with a new outbreak of disease. The pulsed-field gel electrophoresis (PFGE) assay is performed on all *E. coli* 0157:H7 and *Listeria* species within 96 hours of submission for fingerprinting purposes. The results of this testing are immediately compared with data from other isolates from across the country for possible relatedness. All *Salmonella* isolates submitted for banking have serogrouping and serotyping performed as well as antimicrobial susceptibility testing. Serotyping is performed for epidemiological reasons while the susceptibility testing monitors for the development of drug resistance that is seen in certain *Salmonella* serotypes. Starting in the fall of 2006, the NPHL began sending all *Salmonella* isolates to the Minnesota State Public Health Laboratory for PFGE testing. Minnesota is a regional testing center for PFGE. The results of this testing are entered into the CDC PulseNet System. PulseNet is a real-time database of all PFGE results from across the country that is used for epidemiological purposes. The sooner laboratories provide isolates to the NPHL, the sooner an unusual organism can be detected leading to notification of the epidemiologist and subsequent outbreak investigation. Therefore isolates should not be stored at the community level, but should be transferred as soon as possible to the NPHL.

Haemophilus influenzae and *Neisseria meningitidis* from sterile body sites are serotyped and if required are submitted to the CDC for further testing for detection of specific serotypes. PFGE can be performed on any submitted isolate if needed for an outbreak investigation.

The banking of isolates also allows the NPHL to participate in cutting edge research in the testing of new methodologies with the CDC. In the fall of 2006 the NPHL was 1 of 4 beta-test sites across the country and Canada to evaluate a micro-sphere immunoassay method for *Salmonella* serotyping being developed by the CDC. In 2007, the NPHL was chosen as a test site to validate a real-time PCR assay to identify *Campylobacter* species.

The participation of the clinical laboratories across the state is a vital part of this process for epidemiological testing and for the validation of new technologies. The prompt submission of bankable isolates is vital to allow the epidemiological process to begin and to help improve the discovery and investigation of any potential outbreaks (**Table 2**).

For further information please contact Beth Schweitzer at the NPHL 402-559-6098.

<i>Campylobacter</i> spp.	342
<i>Salmonella</i> serogroups	238
<i>Shigella sonnei</i>	100
Shiga toxin positive <i>E. coli</i> ^a	62
<i>Streptococcus pneumoniae</i> ^b	30
MRSA	10
<i>Haemophilus influenzae</i> ^b	10
Group A <i>Streptococcus</i> ^b	6
<i>Neisseria meningitidis</i> ^b	5
Group B <i>Streptococcus</i> ^b	4
Vancomycin-resistant <i>Enterococcus faecium</i> , synercid resistant	3
<i>Bordetella pertussis</i>	3
<i>Aeromonas</i> spp.	3
<i>Listeria monocytogenes</i>	2
Other ^c	1 (each)

^a Includes all serotypes of Shiga toxin producing *E. coli* (i.e. 0157:H7, and 0157:NM)

^b From sterile body sites only.

^c *Plesiomonas shigelloides*, *Shigella boydii*, *Vibrio parahaemolyticus*, *Yersinia enterocolitica*, and Vancomycin intermediate *Staphylococcus aureus*.

<i>Acinetobacter baumannii</i> (multi-drug resistant)
<i>Campylobacter</i> spp. ^c
<i>Escherichia coli</i> 0157:H7
<i>Haemophilus influenzae</i> ^c (from sterile body sites)
<i>Listeria monocytogenes</i>
<i>Mycobacterium tuberculosis</i> complex
<i>Neisseria meningitidis</i> ^c (from sterile body sites)
<i>Salmonella</i> spp.
Shiga toxin + stool culture filtrate
<i>Shigella</i> spp.
<i>Staphylococcus aureus</i> (vancomycin non-susceptible)
<i>Streptococcus pneumoniae</i> ^c (from sterile body sites)

^a Isolates for submission to the CDC are first forwarded to the NPHL to facilitate shipping, handling, and result reporting.

^b Banking may include any organism with an unusual susceptibility pattern or outbreak association per request of the Epidemiology Division of NHHSS.

^c The viability of this organism decreases over time and it should be sub-cultured to fresh sheep blood agar (*Campylobacter* and *Strep. pneumoniae*) or chocolate agar (*N. meningitidis*) if >3 days prior to submission.