IDAHO BUREAU OF LABORATORIES

CLINICAL FORUM

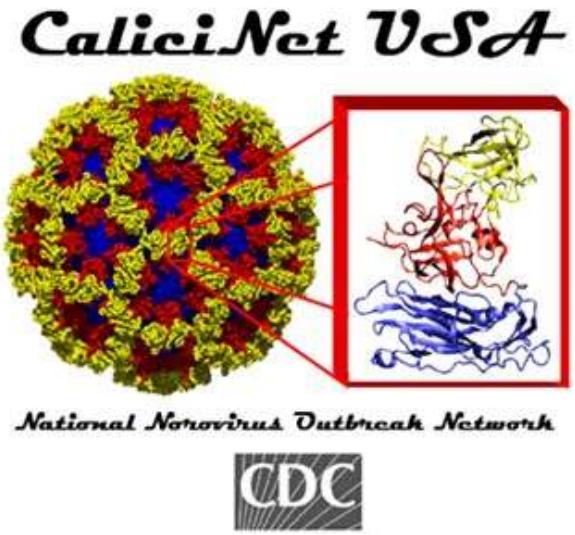
Volume 2, Issue 1
Spring 2009

2220 Old Penitentiary Road, Boise, ID 83712 208-334-2235
http://www.statelab.idaho.gov –or- statelab@dhw.idaho.gov

Idaho Bureau of Laboratories to Join CaliciNet in 2009

Christopher L. Ball, Ph.D.

Beginning in 2009, the IBL will be among the first labs to join CDC's national Norovirus outbreak network CaliciNet USA (figure). CaliciNet is a DNA sequence based subtyping network that is modeled after the highly successful PulseNet program for bacterial foodborne illness surveillance. The implementation of this network will be quite valuable in our nation's effort to protect the food supply. Norovirus, commonly referred to as the "stomach flu", is an underappreciated cause of foodborne illness. For example, in a 1999 article, Mead et al.[1] suggested that noroviruses cause about 67% of foodborne illnesses in the United States infecting as many as 23 million people a year.



continued on page 2…

In This Issue

SENTINEL LAB BIOTERRORISM WORKSHOP

Thursday, June 11th
8 am - 5 pm

The Idaho Bureau of Laboratories will be hosting a Sentinel Lab Bioterrorism Workshop in Boise, Idaho. The workshop will review the LRN in Idaho, laboratory safety issues while working with Category A and B agents, handling select agents, and laboratory diagnostics for rule-in/rule-out of select agents. The afternoon will take participants through actual laboratory cultures, microscopic viewing and biochemical tests for the select agents as well as some other IBL lab programs.

IBL has funding available for transportation and lodging for this workshop.

If interested in attending, please contact Carole Morgan at 208.334.2235 ext 250.

More recently, Patel and colleagues[2] estimated that Noroviruses cause >90% of viral gastroenteritis outbreaks and nearly 50% of "all-cause" outbreaks worldwide. Not only are Norovirus outbreaks prevalent but over the last few years the number of reported Norovirus outbreaks has increased. This national trend was quite apparent in Idaho where, according to the August 24, 2007 *Morbidity and Mortality Weekly Report* (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5633a2.htm#top), we saw a 260% increase in reported Norovirus outbreaks from 2005 to 2006. As a case in point, in March 2009 a Norovirus outbreak at the Idaho Correctional Institution closed the facility to visitors and volunteers making national headlines in the process. Lindesmith et al.[3] suggest that this U.S. increase is due to the emergence of two new strains designated GII.4 Farmington Hills and GII.4 Minerva.

These strain designations may seem a bit unusual at first glance and require a bit of further explanation. Noroviruses are one of four recognized genera in the *Caliciviridae* family of positive-sense, single stranded, RNA viruses. Based upon sequence analysis of the capsid protein VP1, noroviruses have been categorized into five genogroups designated with roman numerals GI – GV[4]. Strains from genogroups GI, GII, and GIV have been associated with human disease[2]. Among these groups, genogroup II is most commonly associated with outbreaks[3]. Norovirus genogroup II can be further subdivided into 17 genotypes using CaliciNet strain typing methods[4]. For example, the strain referenced above, GII.4 Farmington Hills, is a member of genogroup II, genotype 4, and was isolated from Farmington Hills, Michigan. With this level of strain identification, CaliciNet laboratories will hopefully enable epidemiologists to differentiate between co-occurring or overlapping outbreaks and more sharply discriminate between sporadic and epidemic cases. Hopefully this increased resolution will allow for the attribution cases to implicated food items and help clarify the epidemiological picture for this agent of foodborne illness.

The Idaho Bureau of Laboratories accepts stool or vomitus samples for the detection and subsequent subtyping of Norovirus. Typically, samples are submitted by district or state epidemiologists in support of an outbreak investigation. If you have additional questions about submitting samples to the IBL please contact Colleen Greenwalt, Microbiology Supervisor, at (208) 334-2235 x 228 or greenwac@dhw.idaho.gov.

---

[1] Mead PS, Slutsker L, Dietz V, McCaig LF, Bresee JS, Shapiro C, Griffin PM, Tauxe RV. 1999. Food related illness and death in the United States. Emerging Infectious Diseases [Internet]. [cited 2009 March 11]; 5(5):607-625. Available from: http://www.cdc.gov/ncidod/eid/vol5no5/mead.htm

[2] Patel MM, Hall AJ, Vinje J, Parashar UD. 2009. Noroviruses: a comprehensive review. J Clin Virol 44(1):1-8.

[3] Lindesmith LC, Donaldson EF, LoBue AD, Cannon JL, Zheng DP, Vinje J, Baric RS. 2008 Mechanisms of GII.4 Norovirus persistence in human populations. PLoS Med [Internet]. [cited 2009 Mar 11];5(2): e31. Available from; doi:10.1371/journal.pmed.0050031

[4] Zheng DP, Ando T, Fankhouser RL, Beard RS, Glass RI, Monroe SS. 2006. Norovirus classification and proposed strain nomenclature. Virology 346(2):312-323.

Lab Confirmation for Ricin and Abrin Exposures

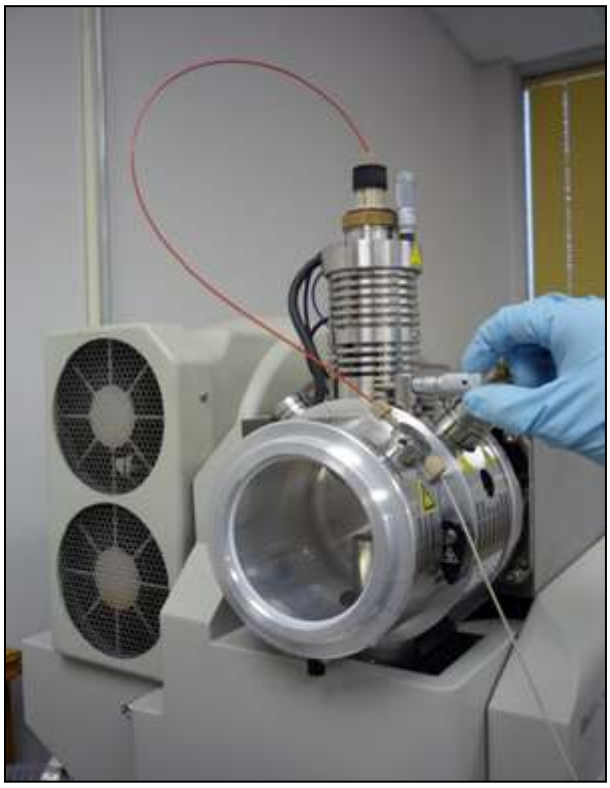
Ian A. Elder, Ph.D.

The Idaho Bureau of Laboratories (IBL) has finalized implementation of a Centers for Disease Control and Prevention (CDC) method that can be used to confirm exposure to ricin and abrin. Ricin and abrin are natural poisons extracted from the castor bean and the rosary pea, respectively. A toxic syndrome description for ricin and abrin can be found at CDC's Emergency Preparedness and Response website:
http://www.emergency.cdc.gov/agent/ricin/hp.asp

In the Laboratory Response Network (LRN) procedure, biomarkers are extracted from urine and analyzed by liquid chromatography-tandem mass spectrometry (LC-MS/MS). Method implementation at IBL included participation in a CDC validation study, completion of a standard operating procedure, integration into the laboratory information management system, and acquisition of "qualified status" through participation in LRN proficiency tests.

This analysis is available through standard Idaho LRN activation procedures (i.e. referral through a district health department). Urine should be collected as soon as possible after suspected exposure; preferably within 48 hours. The optimal amount of specimen is at least 5 mL with a minimum requirement of 1.5 mL. Acceptable specimen containers are plastic urine cups with screw caps. Samples should be frozen at -20 ºC and transported on dry ice. Submit two blank (*i.e.* empty) containers for each specimen container lot. Blank containers must be handled and stored in the same manner as urine specimens. Samples should be packaged for transport according to applicable regulations (*e.g.* IATA, DOT, or courier-specific). The test requisition form can be found in the Clinical Chemistry section of the IBL website:

http://www.statelab.idaho.gov



Mass Spectrometer Ion Source Housing

Update on invasive MRSA reporting in Idaho

Contributed by Office of Epidemiology and Food Protection

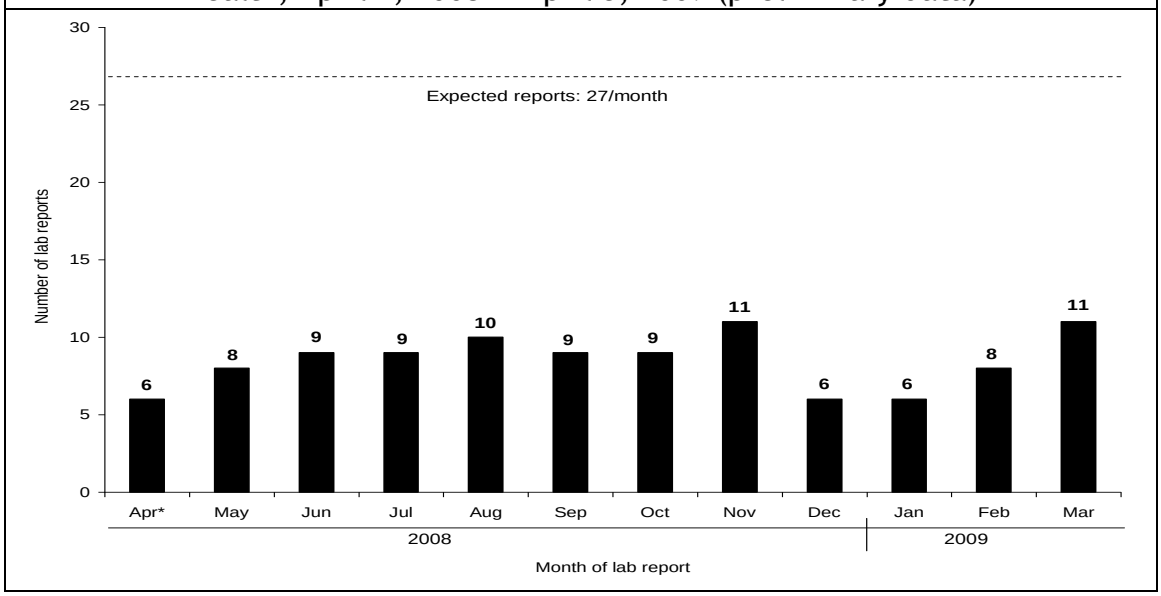
As of April 2008, invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infections are reportable. The law enacted last year requires that laboratories report MRSA isolated from a normally sterile site (*e.g.*, blood, CSF) to local or state public health within three days of identification. Physicians or other healthcare providers are not required to report.

Healthcare facilities have a long history of monitoring MRSA rates, but until 2008, no statewide tracking was done to provide a population-based perspective of the burden of invasive MRSA. Since the implementation of reporting requirements, state surveillance data are available for the most serious MRSA infections.

During the first reporting year, 102 cases of invasive MRSA were reported among Idaho residents[1]. The isolate source was identified as blood in 88% of the cases. Other reported sources included pleural fluid, peritoneal fluid, synovial fluid, and vitreous fluid. Based on incidence rates recently published in JAMA from a study of invasive MRSA in multiple locations in the United States[2], we expected to receive approximately 325 reports annually, or about 27 per month[3]. Underreporting due to lack of awareness of the new law is a concern; it is also possible that rates of MRSA are lower in Idaho than in the participating sites included in the study, notably rates did vary widely by site in the JAMA study. Due to considerable variation in site-specific incidence in the study-reported national figures and the very recent reporting in Idaho, further evaluation will consider both underreporting and real geographic differences as factors influencing statewide incidence rates.

[1] Data are preliminary.
[2] Klevens RM, Morrison, MA, Nadle J, Petit S, Gershman K, Ray S, et al. Invasive methicillin-resistant *Staphylococcus aureus* infections in the United States. *JAMA*. 2007; *298(15)*: 1763-71.
[3] Expected statewide incidence was calculated based on incidence estimates among Whites published in Klevens, et al. The lower bound of the confidence interval was used to produce conservative incidence expectations based on Idaho's population counts.

Number of invasive MRSA reports received each month by Idaho Public Health, April 4, 2008* – April 3, 2009 (preliminary data)



*Reporting began April 4, 2008