

Wyoming's Lab Loop

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All *Salmonella* Serotypes Are Not Created Equal

The genus *Salmonella* is divided into two species; *Salmonella enterica* and *Salmonella bongori*. *Salmonella enterica* is further subdivided into six subspecies that are designated by proper names or Roman numerals. Only Subspecies I serotypes are given proper names, usually geographically related to their first appearance or first large investigated outbreak. *Salmonella bongori*, the second species, is often referred to as Subspecies V.

There are more than 2500 described *Salmonella* serotypes, with about 60% belonging to Subspecies I. In the United States, 90% of *Salmonella* serotypes are Subspecies I. The Wyoming Public Health Laboratory (WPHL) receives approximately 100 *Salmonella* isolates per year. The majority of these are Subspecies I, but we routinely see Subspecies IIIa, IIIb, and IV. In any given year, WPHL receives about ten isolates that are serotypes we have never seen before. All *Salmonella* isolates received at WPHL are frozen in sheep's blood and archived.

Salmonella isolates are serotyped using the Kauffmann-White Scheme. For years the Centers for Disease Control and Prevention (CDC) and the state public health laboratories used a modified version of the Kauffman-White Scheme. Since 2002, this algorithm has been under constant revision to bring the CDC and World Health Organization (WHO) versions into complete agreement. Evolving molecular technology also clarifies issues between problematic serotypes. Every year CDC releases a list of corrections to the algorithm. Additionally, there are new serotypes identified every year.

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Proficiency Testing for BT Organisms: CAP – LPX for 2009

As part of the Wyoming Laboratory Response Network, the Public Health Emergency Preparedness Program purchases the College of American Pathologists (CAP) Laboratory Preparedness Exercise (LPX) annually for the laboratories designated as Advanced Sentinel Laboratories. The CAP-LPX supplies two educational events per year consisting of four challenges per event. The organisms in these challenges may, or may not, be on the Select Agent list defined by the Centers for Disease Control and Prevention (CDC).

This exercise resembles a proficiency test, yet it is used as a learning experience and is not graded. The educational tool gives microbiologists the opportunity to observe rarely seen Select Agent look-alikes or attenuated strains growing and reacting biochemically in vitro. The tool also serves to meet a benchmark set by the CDC, providing them a format where they can demonstrate proficiency in recognition of potential Select Agents. It also tests the lab's ability to respond appropriately once a Select Agent cannot be 'ruled out'.

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Summer 2009 Workshops in Laramie

During the summer and fall of 2009, the Emergency Preparedness Program sponsored two workshops, both of which were held in Laramie, Wyoming.

The first workshop, "Shipping Infectious Substances", was held in August. In the past, this workshop had been offered in a one day format, but this year it was expanded to a one and half day format. The longer format allowed more time to absorb a difficult subject.

The class was presented by Mr. Eddie Scott from the Transportation Safety Institute of Oklahoma City, OK. The class was attended by 25 people from 17 different facilities.

Because the class spanned two days, a banquet was held in the evening for the attendees. The evening centered around a murder mystery, "A Tragic Turn of Events at the Cozy Grove Quarry"; a mystery involving a possible chemical exposure and revolved around a deranged archaeologist, a crabby circuit judge, and an organic produce farmer. The mystery banquet served as a fun format to learn something about chemical exposures and their effects.

FRIDAY, SEPTEMBER 4, 2009 COZY GROVE, WYOMING \$1.75

Cozy Grove Gazette

For All Your News Needs!

CONVENTION

Today's Events

- Senior Bowling League to meet at the Hard Sirkles Bowling Alley tonight at 7:00 pm
- Frisbee Throw in the Park at Park: Showng tonight is Schrek II starting at dusk. Bring a lawn chair and blanket.
- Interpretive Historical Tours: Starting at the Grove Museum - leaving on the hour starting at 1:00 pm and ending at 4:00 pm
- Farmer's Market every Wednesday night in town square sponsored by Cor's Market: 7:00 am - 3:00pm

Inside this issue:

Police Blotter

Letter to the Editor

Local News

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HARRY'S
COME IN FOR THE BUZZ
1-5PMON-FRI
8-8 SAT
CLOSED SUNDAY
502 MAIN ST.

JUDGE JEREMIAH JACKSON FOUND DEAD AT TOWN QUARRY

Instead of private practice, the Judge was compelled to public service and became a circuit court judge of the state, which required him to travel extensively throughout the state, often residing in Cozy Grove or at the original homestead, Jackson Ranch, in 2005.

He married in 1938 and soon added a son to his family, yet tragically, he lost his young wife and infant son in a car accident on Silver Lake in 1960. The Judge never remarried, but chose to devote his entire life to public service.

The town will surely miss Judge Jackson.

Ezra Jackson's grandfather, Jeremiah's grandpa, moved to Runover Co. in 1888 and was instrumental in the founding and development of the Cozy Grove community. This agricultural area once boasted more cattle than people, but now, thanks to the contributions of the Jackson Legacy, the valley bustles with prosperity and plenty.

Reunions were made at the annual Reunion Parade on E. 3rd Street. Funeral to be announced at a later date.

Dr. Olen Rock, Cozy Grove's newest book takes place not at the fossil record to describe a historic man's transition from a nomadic to a stable culture and the impact it had on their lifestyle and daily lives. Dr. Rock will be at the Library from 3 pm to 6 pm tonight.

Practicing Culture: Should we Hunt or Should We Gather? Is on sale at the library. Books are on sale. You can bring your copy next Friday to the library or take your copy to his studio on 510 Pine Street for him to autograph!

Local Author to Speak at the Library

The murder mystery banquet began with Cozy Grove Gazette headliner of Judge Jeremiah Jackson's death.

routine laboratory practices. The morning lecture was reinforced by an afternoon wet lab session, with each station focusing on a specimen collected from a body site (wound, urine, stool) and its workup. The CLSI M-100 guidelines were utilized at each station to demonstrate the use this important document in a lab on a daily basis.

Looking ahead, training options are being discussed for 2010. Please watch for email from your state training coordinator that will outline future educational offerings!

The second workshop, "Exploring Best Practices in the Laboratory", originally scheduled for June, was held in October at the University of Wyoming. The workshop had been postponed due to the H1N1 influenza outbreak, and came very close to being postponed again in October, as the virus resurfaced with a vengeance early this fall. The workshop time slot also competed with hunting season so the participant

numbers were down. We were able to accommodate 15 attendees from 12 facilities and all felt it was a rewarding experience.

"Exploring Best Practices in the Laboratory" concentrated on biosafety practices in the laboratory and the State of Wyoming Reportable Disease List.

Emphasis was placed on methodology that could be used in the facilities as

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Laboratory System Improvement Program (L-SIP) Held in Cheyenne

The Wyoming Public Health Laboratory (WPHL) sponsored a Laboratory System Improvement Program (L-SIP) meeting on October 28, 2009. The meeting began by gathering various partners who are part of the Public Health Laboratory System in Wyoming and making the first formalized attempt at obtaining objective information on our state's laboratory system. This meeting was considered a very timely and constructive process during a period of budget reductions, implementation of a WPHL fee system and the construction of a new public health laboratory.

Our first attempts at planning this meeting had to be adjusted due to the influenza pandemic earlier in the year. We decided to shift our assessment date to later in the year, which challenged our best attempts to avoid conflicts that arise in the fall. Attempting to avoid conflicts with other health conferences, our new assessment date ended up being in the middle of an early influenza season, in the middle of elk hunting season and during a major snowstorm, a storm that was not on our schedule...

Since the majority of our participants were from Cheyenne, the decision was made to hold the assessment locally. We chose the Historic Plains Hotel in Downtown Cheyenne for the meeting. The Plains is a special historic western hotel with very small elevators, which back in the day were designed small to prevent cowboys from taking their horses up to their rooms. These little elevators are not for the claustrophobic. But the ambience of this historical site and the hospitality of the staff made this an ideal site for our meeting.

As part of our National Laboratory System grant that was part of a four-state western consortium including North Dakota, South Dakota, and Montana, we included the L-SIP as an

effort to enhance our public and private laboratory and system partnerships. We hired a contractor to plan and coordinate the meeting since we lacked WPHL staff, especially with the influenza testing situation monopolizing everyone's time. We were fortunate our facilitators and theme takers, who drove in from other parts of the state, arrived before the storm. By the morning of the meeting, roughly half the participants were able to attend since all major roads to Cheyenne were closed. By 1:00 P.M., the Governor shut down all state offices and the town was closing around us. The Hotel was letting staff leave before they got snowed in at work. Our emergency response partners, who were kind enough to attend the meeting on such a dubious day, could hardly stay put because their emergency cell phones were ringing off the hook! We still were able to review all the Essential Services and with our reduced numbers had very active participation. We managed to close our meeting by 1:30 P.M. and send our local partners home before they had to shelter in



Tyler Bown, Lab Manager from Evanston Regional Hospital serving as a Theme Taker, works the room with Dr. Karl Musgrave, the Department of Health's Veterinarian and Group Facilitator, to capture the present issues of the essential services.

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All *Salmonella* Serotypes Are Not Created Equal (continued from Page 1)

In 2006, 40,666 *Salmonella* isolates were reported to CDC from participating public health laboratories. The WPHL is not a participating laboratory at this time. There are several other state public health labs which are not fully participating also.

Serotyping is divided into two procedures. First, the O Single Factors are determined by slide agglutination. The O antigen is a combination of four to six sugars forming the outermost component of the lipopolysaccharide (LPS). The LPS is the outermost membrane of gram negative bacteria, contributing to the structural integrity and protecting the membrane from certain types of chemical attack. Variations in the O antigens results from variation in the sugar components, variation in the covalent bonds between the sugars, and variation in the linkages between the sugars and the polysaccharide.

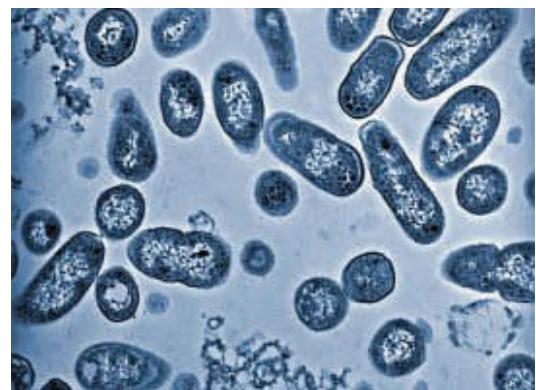
Second, H antigens are then determined by tube agglutination. The H antigen is the filamentous portion of the bacterial flagella. This portion is made up of proteins called flagellin. *Salmonella* can express two different flagellin antigens, however there are monophasic variants, and a few non-motile variants also.

Pulsed field gel electrophoresis (PFGE) is not used to determine *Salmonella* serotypes, but can be used to confirm an identified serotype. Most PFGE patterns are specific to a given serotype. Rarely is one pattern seen in two or more serotypes.

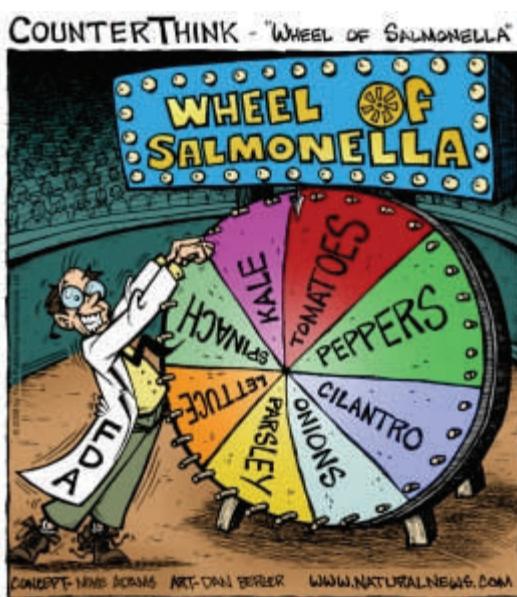
Salmonella serotypes may tend to target specific animal species. For many years, *Salmonella Typhimurium* was commonly associated with poultry. Recent outbreaks related to peanut butter paste, tomatoes, cantaloupe, and salad greens suggest this is no longer a valid assumption. Between 1996 and 2006 the numbers reported to CDC of *Salmonella Typhimurium* have decreased by about half, but the numbers of the two variants, *Salmonella Typhimurium* var. *Copenhagen* and I 4,5,12:i:- have increased twenty-fold and ten-fold respectively in the same time period. The *Salmonella* world is very dynamic.

One large outbreak can dramatically shift the numbers of serotypes reported as well as the numbers within a serotype reported.

From a veterinary standpoint, *Salmonella Subspecies IIIa* and *IIIB* are frequently associated with reptiles. Multi-drug resistant (MDR) *Salmonella Newport* is found primarily in pork and in employees of confined animal feeding operations that produce pork. Horses succumb to *Salmonella Rubislaw* infections. In Wyoming, grain fed to horses has been suspected as a source. In reports to CDC in 2006, cattle were most frequently infected with *Salmonella Oranienburg*. At WPHL, most of the *Salmonella* isolates from cattle received since 2001, have been *Salmonella Typhimurium* or *Salmonella Typhimurium* var. *Copenhagen*. In Wyoming, dogs have been infected by a wide variety of *Salmonella Subspe-*



A photomicrograph of *Salmonella* bacteria.
Courtesy of Pacific Northwest National Laboratory.



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Salmonella Serotypes (continued from Page 4)

cies *I* serotypes, possibly due the amount of human food they eat, their non-discriminatory palate, and their exploratory nature.

Salmonella serotypes also vary widely in pathogenicity. Generally, monophasic H antigens variants tend to be more virulent than their diphasic counterparts. *Salmonella Enteritidis* is one of the most common serotypes and very rarely is it found in a diphasic form. *Salmonella Tennessee* was the culprit in the Peter Pan peanut butter outbreak in 2007. Interestingly, when found in females, it was usually cultured from a urine sample, not a stool sample. Similarly, *Salmonella Dublin* is most often found in blood cultures from the over 60 age group, indicating the severity of the illness and the necessity of hospitalization.

Salmonella infections have existed for a long time, but there is still much to learn about this evolving organism and its effect on our food supply and our health.

CDC. *Salmonella* Surveillance: Annual Summary, 2006. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2008.

DID YOU KNOW?

Between 1979 and 2002, there were an average of 689 deaths per year due to hypothermia.

MMWR Feb 25, 2005.

L-SIP (continued from Page 3)

place at the hotel with the out-of-towners.

In order to take this important meeting to completion, we will be asking participants who could not physically attend, to provide us with their comments on the essential services they would have reviewed. Some of the key system issues we have determined that are important include:

- ⇒ The need for more communication and training of many of our partners
- ⇒ Better inclusion of more partners
- ⇒ The need for faster turnaround of results
- ⇒ The need for a mission statement of the WPHL and the system
- ⇒ More inclusion of system partners in decision-making and gaps in testing offered

The discussion provided very useful information to objectively evaluate our laboratory system.

Even though the storm may have altered our processes somewhat, in true Wyoming fashion, we adjusted to our situation and satisfactorily met our objectives. Our out-of-town partners thought that hunkering down at the Plains was not bad. There is a lot to be said about warm and comfortable accommodations on a cold wintery night!



One of three groups discussing the pros and cons of a laboratory essential service at the Laboratory System Improvement Program in Cheyenne.

Are You Ready to Start Thinking About Intermountain States Seminar?

For Your Information!!

Wyoming is the host state for the Intermountain States Seminar for September 2010! What a great year to host our annual conference!

2010 will mark the 47th anniversary of the Intermountain States Seminar (IMSS). Forget 2010 Space Odyssey; I am pleased to announce the theme this year is going to go green with "Recycle, Reuse, and Go Retro". In addition to top notch educational opportunities, this is the time to come and network with your peers, spend time with our vendors who relish the opportunity to show us their state of the art laboratory toys, and to have some fun in the Tetons!

Dust off your bell bottoms and shine your disco ball because we will host a Decade Party with prizes awarded to best Costume of the Decade. Since IMSS started back in 1963, the decades will focus on the 60's, 70's, 80's, and 90's.

If you are planning to attend IMSS this fall, please consider volunteering to help the Wyoming Planning Committee. We can use all the help we can get to host an IMSS that cannot be forgotten!

Interested in helping? We will definitely need on-site help in September. If you cannot attend, there are still things you could do behind the scenes. Please contact any of the following committee members and get more information:

Trish Brown at trishbro@tctwest.net

Theresa Barbre at theresa.barbre@va.gov

Gale Stevens at gale.stevens@health.wyo.gov

Keep in mind, Wyoming is known for having the BEST volunteers and for throwing REALLY GREAT PARTIES, so if you think you can be of help we want you on our team!

Interested in discounted registration fees? Strongly consider a membership in Wyoming's chapter of American Society for Clinical Laboratory Scientists (ASCLS). This is our professional organization, which lobbies for laboratorians and promotes our field. Your membership goes a long way to support medical technology in an environment where healthcare is changing rapidly. Visit www.ascls.org and join today!

Proficiency Testing for BT Organisms: CAP – LPX for 2009 (continued from Page 1)

The purpose of this exercise is two-fold. First, this exercise tests the sentinel laboratory's ability to recognize certain triggers, which prompts the use of specialized testing algorithms and flow charts to assist in the rule-out/refer process of identifying a Select Agent. Second, it exercises Wyoming's Laboratory Response Network. When the microbiologist in a sentinel laboratory determines which organisms in the exercise cannot be ruled-out, but would need to be referred for Select Agent confirmation, the Bioterrorism Response Laboratory (BRL) is notified. These statistics are monitored and reported to the Association of Public Health Laboratories and are used to report training and the competency of the network to the CDC.

In 2009, this exercise was purchased for 31 Advanced Sentinel Laboratories in Wyoming. LPX-A (Spring Challenge) had 15 of the 31 labs reporting to the BRL for a participation rate of 48%. LPX-B (Fall Challenge) had 14 of the 31 facilities reporting to the BRL for a participation rate of 45%. These numbers were significantly lower than 2008, which had an overall

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Winter Wonderland Word Search



Bobsleigh	curling	downhill	skilift	snowpack
speedskating	halfpipe	qualify	gates	ceremony
flame	Hockey	mogul	team	alpine
vancouver	freestyle	crosscountry	track	snowboard
Preliminary	finals	Race	Jump	luge
slalom	doubles	mens	womens	axel
lutz	toeloop	salchow	partners	flip
blades	judging	medal	gold	

New WPHL Lab Update

Work continues at a steady pace at the new State of Wyoming Combined Laboratories Facility that will house the Wyoming Public Health Laboratory (WPHL). The November steering committee meeting was held on-site, with a tour concluding the meeting. The exterior block walls are up and most of the roof is on the 100,000+ square foot facility. The back parking lot has been paved, so there is plenty of space for contractor parking throughout the winter. The exterior brick-work is nearly finished on the south side of the building. Metal studs are going up in the crime lab and plumbing connections are being installed. The floors for the electrical and telecom rooms have been poured, completing the interior cement work.

We have a proposed move-in date of September 28, 2010, though the general contractor and the architect believe we will be in before that date. The facility is located on the east side of Cheyenne, just north of Laramie County Community College on College Drive. The facility will house WPHL, Wyoming Department of Environmental Quality (DEQ) Laboratory, Department of Criminal Investigation (DCI) Crime Lab and the DCI investigators.



Clerestory covering the Microbiology wing of the new WPHL lab.



Entrance of the Combined Laboratories Facility in Cheyenne.

CAP-LPX (continued from Page 6)

participation rate of 84%.

The CAP-LPX is a great opportunity for continued training in our laboratories. Watch for the 2010 Spring Challenge and plan to participate! Your participation makes the Wyoming Laboratory Response Network effective!

Wyoming Chapter of the American Society for Clinical Laboratory Scientists

Save The Date!

Intermountain States Seminar!

Where?
Jackson Hole, Wyoming
When?
September 8 - 12, 2010

Recycle & Go Retro

Plan to GO GREEN at IMSS!
Host State: WYOMING

Summer Findings in the Wyoming Public Health Bacteriology Laboratory

John Harrison, resident microbiologist, has provided an update to the recent findings in the WPHL Bacteriology Lab. Here are a few of the most unusual organisms he has seen since the last edition of the Lab Loop.

Streptococcus mutans – isolated from human blood culture. Gram positive, facultative anaerobe bacterium commonly found in the human oral cavity and is significant contributor to tooth decay. The microbe was first described by J.K. Clarke in the article “On the bacterial factor in the etiology of dental caries”.

Actinomyces coleocanis – isolated from a cat lung.

Actinomyces spp. primarily belong to the facultatively anaerobic indigenous microflora of human and animal mucous membranes (i.e. oral cavity, intestine, and female genital tract), and several species are established pathogens.

Campylobacter curvus – isolated from human gall bladder.

Rarely encountered ***Campylobacter spp.*** in human, animal, and environmental samples. Is known to cause sporadic and outbreak cases of bloody gastroenteritis or chronic diarrhea in humans.

Roseburia hominis – isolated from human blood culture.

Gram variable or Gram negative, strictly anaerobic, slightly curved bacilli that measure approximately 0.5X1.5-2.0 μ m.

Bibersteinia (Pasteurella) trehalosi – isolated from a human wound caused by a cat bite.

This bacteria is an important pathogen of sheep, being primarily associated with serious systemic infections but also having association with pneumonia.

DID YOU KNOW ?



Do not panic if marooned in your car during a blizzard. Stay in the car, unless you can see safe shelter. Run the engine briefly to keep warm, but open the window slightly for ventilation. WY Homeland Security 2003.

D	F	T	O	W	G	W	J	M	V	Q	H	L	V	U	A	K	L	C	S	D	C	U	E	D		
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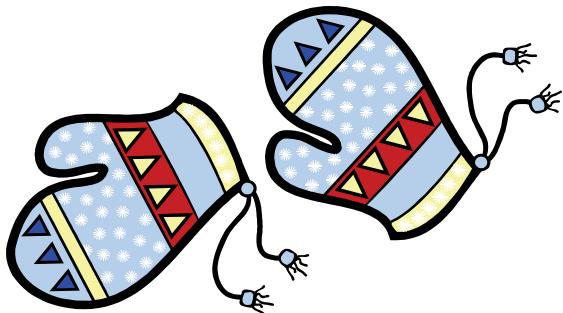
Wyoming's Lab Loop

Information Available in this Issue:

- *Salmonella Serotypes*
- *Proficiency Testing for BT Organisms*
- *Summer Workshops in Laramie*
- *L-SIP in Cheyenne*
- *IMSS Coming Up In Jackson*
- *New WPHL Update*
- *Summer Bacteriology Bugs*

What's Coming Up?

Event	Location	Date
CLCC	TBD	Apr 22-23, 2010
American Society for Microbiology	San Diego, CA	May 23-27, 2010
IMSS	Jackson, WY	Sept 8-10, 2010



Check out the BT Resources page at:

<http://wdh.state.wy.us/phsd/lab/btintro.html>

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