

Michigan Department
of Community Health



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LabLink

Michigan Department of Community Health
Bureau of Laboratories

"Quality Laboratory Science for Healthier People and Communities"

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Preparedness - An Everyday Occurrence for Clinical Labs in Michigan

**Valerie Reed, RM(ASM), M(ASCP)
Bioterrorism Preparedness Coordinator**

"Public health isn't something that happens at the CDC or in a building at the state capital, it happens in each clinical laboratory every day. You are the front line of the public health workforce. Your importance and role in public health has become increasingly evident with the many new emerging infectious diseases and the need to effectively respond to these and other emergency and terrorism events. As laboratorians, we have a new reality. The work that we do is no longer confined to the walls of our organization and patient samples. Instead, our work now impacts all of the citizens of our community, state and nation. . . In terrorism preparedness, public health labs and clinical labs have adopted new systems and formed new partnerships, which have made all of our laboratories better and have promoted the importance of laboratory medicine throughout the nation. "

"So now on top of everything else you are supposed to do in the lab; quality control documentation, procedure writing, preparing for CLIA, CAP, COLA or JCAHO surveys, performance appraisals, . . . let alone doing patient test analysis, you are now a front-line laboratory to help detect bioterrorism agents and help in the collection of samples for possible chemical terrorism events. Is it worth

the extra time and effort? The answer is a resounding "Yes," since the activities related to being prepared for handling biological and chemical terrorism events are also directly applicable to handling any major disaster, outbreak or emergency event."

". . . let our (preparedness) colleagues know and understand what we all do in the laboratory and the important role we have in emergency response - we don't just push buttons - we save lives. It is important to remember that addressing public health preparedness is an important element in protecting our communities from all health threats." (This excerpt printed with permission by the author, Bonnie Rubin - Emergency Preparedness and Terrorism Response Coordinator from the University of Iowa Hygienic Laboratory.)

So how do laboratorians assure that they are able to respond to whatever agent or emergency is thrown their way? They continue to participate in educational opportunities, become involved in exercises and drills that are planned in the area, and know their appropriate role should an emergency occur.

How can laboratorians find out what training is available to them? Go to <http://mi.train.org> . If they are not registered yet on MI-TRAIN this

website will guide them through the easy process. Once registered, it is simple to search and locate a variety of available educational options. Registration on MI-TRAIN is now available for the following offerings:

Michigan Department of Community Health Bureau of Laboratories is offering the "Sentinel Laboratory Challenge." This course is a pilot challenge for Sentinel Laboratories. It consists of a short case study, with images, and concludes with a short quiz.

"Michigan Clinical Laboratory Day" is being offered in multiple sessions throughout the state. This day long course will cover a variety of topics relevant to clinical laboratory preparedness including packaging and shipping, bioterrorism review and chemical terrorism update. This is an opportunity to refresh identification skills or orient new laboratory staff members.

Also, the "Community Response to Infectious Diseases: Public/Private Integration in Response to Laboratory Results" meetings continue to be offered throughout the state. This is a popular series to foster partnerships between local public health, clinical laboratories, and preparedness partners in the community who respond to current and emerging infectious diseases.

Check out the MDCH Bureau of Laboratories website at <http://www.michigan.gov/mdchlab>. This site contains laboratory updates, specimen submission, lab services guidelines, contact information for the Bureau of Labs, as well as links to training, archived broadcast faxes, MI-HAN informational alerts and previous *LabLinks*.

Besides the trainings listed above that are sponsored within Michigan, investigate training available through the National Laboratory Training Network (NLTN) at: <http://www.nltn.org>. The NLTN offers self study, "Workshop-in-a-Box" and nationwide courses. Another great resource is a free on-line course offered by the California Department of Health Services in collaboration with the NLTN, "Bioterrorism Preparedness Training for LRN Sentinel Laboratories" found at <http://bttrain.org>. This

consists of in-depth interactive modules for several BT agents.

Don't forget the many audioconference offerings available to laboratories. With limited time or funding for travel, this is an excellent way to provide current updates to many staff members on - site. South Central Association of Clinical Microbiology (SCACM), American Society for Microbiology (ASM), NLTN and others offer a wide variety of subjects relevant to laboratorians.

Clinical laboratorians, by the nature of their daily "routine" work, are on the front line of any emerging disease or threat to public health acting as true sentinels in the community. The integrity, dedication and excellence of the laboratory workforce in Michigan assure preparedness for any threat to the health of the community. Spread the word, laboratorians don't just push buttons and streak plates, they save lives.

Bureau of Laboratories Vision

The Bureau of Laboratories is a stronger, more diverse team within an integrated public health system. We utilize advanced technology and innovative leadership to provide comprehensive public health services in our dynamic global community.

Bureau of Laboratories Mission

We are dedicated to continuing leadership in providing quality laboratory science for healthier people and communities through partnerships, communication and technical innovation.

Infectious Disease Case Study in Michigan Part 2

William G. Crafts, MT (ASCP) and
Kristine Smith, MT (ASCP)
Bacterial and Parasitic Serology Unit

Answer to Questions in Previous Issue

1. What additional patient information would be helpful to obtain?

- Travel history, any recollection of tick bites or rash.
- Does she own any dogs or cats?
- What treatment was administered back in 2002?

2. What is the differential diagnosis?

Based on the patient residing in an area endemic for Lyme disease (Upper Peninsula's Menominee County), clinical presentation, and laboratory findings, one must immediately rule out tick-borne diseases such as Lyme, ehrlichiosis, rickettsiosis, and babesiosis (depending on travel history). Elevated liver enzymes are not characteristic of Lyme disease.

3. What other tests would assist in the diagnosis of this patient?

Serologic testing for *Borrelia*, *Ehrlichia*, *Rickettsia* and *Babesia*, manual examination of blood smears, and PCR testing for tick-borne diseases.

Anaplasmosis

Background

Human granulocytic anaplasmosis (HGA), formerly known as human granulocytic ehrlichiosis (HGE), has been on the rise since it was first discovered in 1990, primarily due to increased public awareness and reporting requirements initiated by the Centers for Disease Control and Prevention (CDC) in 1998. From 1994 through 2002, the CDC recorded more than 2135 cases of HGA in the United States, primarily occurring in the Northeastern and upper Midwestern states. In 2005, there were a total of 463 cases in the U.S.

Etiologic Agent, Transmission and Pathogenesis

HGA is an acute febrile illness caused by *Anaplasma phagocytophila*, an obligate intracellular small gram negative coccobacillus that utilizes adaptive mechanisms, specifically the inhibition of

apoptosis, to invade and survive within granulocytes, primarily mature polymorphonuclear neutrophils (PMN). Following receptor-mediated endocytosis, infected endosomes fail to fuse with the lysosomal compartment allowing continued proliferation. Transmission to humans occurs through the bite of infected black-legged ticks from the *Ixodes persulcatus* complex that includes *Ixodes scapularis*, *I. pacificus*, *I. spinipalpis* and *I. ricinus* (found in Europe).

Nymphal ticks, primarily active in the spring and summer months, acquire the agents after feeding on infected animal reservoirs such as mice, chipmunks, squirrels and raccoons. Transstadial transmission (through molts) occurs within the tick but there is no evidence of transovarian transmission (from mother to offspring). The prevalence of nymphal and adult ticks infected with *A. phagocytophila* varies from 3% to 25% depending on the area of endemicity. Because *A. phagocytophila* reside in the salivary glands of infected ticks, transmission may occur within the first 24 hours of attachment.

Clinical Symptoms

Most patients are asymptomatic or mildly symptomatic. Symptoms are often nonspecific and usually appear within two weeks following exposure. In the acute stage, patients may present with fever, chills, headache, myalgias, and rarely, a rash (see Table 1). Complications may lead to toxic shock-like syndrome, respiratory distress, joint pain, nausea, vomiting, confusion, anorexia and opportunistic infections. Delaying treatment may lead to organ failure and death. Spontaneous resolution without treatment does occur. However, fever can persist for longer periods, often lasting up to four weeks.

Table 1. HGA Clinical Symptoms

Symptom	Frequency Observed (%)
Fever > 38.5°C	94 – 100
Rigors	30 – 90
Headache	65 – 90
Myalgia	40 – 100
Arthralgia	25 – 60
Nausea, anorexia	10 – 50
Mental status changes	40
Rash	1 – 10
Malaise	40 – 98

Disease symptoms such as fever, malaise and arthralgias result from the production of various chemokines and cytokines, including interleukin 8 and 10, macrophage inflammatory proteins 1 α and 1 β , and others. Individuals co-infected with HGA and *Borrelia* experience more severe illness than that caused by either pathogen alone, with potentially lethal results.

Laboratory Findings

The majority of patients exhibit nonspecific, mild laboratory abnormalities that vary with the duration and severity of illness. Laboratory findings include leukopenia with a left shift, thrombocytopenia, anemia, pancytopenia, elevated hepatic transaminases (ALT, AST) and lactate dehydrogenase (LDH) and elevated C-reactive protein (CRP). In 20 to 80% of patients, morulae (dense intracytoplasmic vacuolar bacterial aggregates) are observed in peripheral blood neutrophils. (See Table 2)

Table 2. HGA Laboratory Findings

Finding	Frequency at Presentation %
Leukopenia	10 – 25
Thrombocytopenia	50 – 75
Hepatic transaminases and/or LDH	Variable
Elevated CRP	75 - 100

Laboratory Diagnosis

MDCH currently refers all HGA testing to CDC.

Blood Smear Examination

Careful manual examination of Wright/Giesma-stained peripheral blood smears should be performed on all suspected HGA patients. Smears are examined for intragranulocytic, raspberry-like basophilic staining morulae. Due to the rapid disappearance of morulae from blood following effective treatment, often within 72 hours, smears must be examined prior to treatment. Most automated differential methods are unable to detect these inclusions. Depending on the severity of infection, inclusions may be present in less than 0.1% of neutrophils making buffy-coat prepared smears and repeat testing useful. Sensitivity of this test varies from 20% to 80% during acute infection

and is dependent upon severity and stage of the disease, duration of infection, and examiner expertise.

Blood Culture

The promyelocytic cell line HL60 has been used to isolate *A. phagocytophila* from whole blood of acutely ill patients. Most clinical and public health laboratories lack the expertise and culture capabilities to perform this method. The organism grows within 7 days of inoculation and sensitivity has been reported to be >90%.

PCR

Direct nucleic acid detection provides rapid and reliable test results. Although only a few clinical laboratories offer this type of testing, it is the most sensitive method for the detection of *A. phagocytophila* in whole blood. EDTA or citrated preserved blood (heparin preservative may interfere with PCR testing) is the preferred specimen. Target genes 16S rRNA, groESL and MSP2 are commonly used and sensitivity varies from 40% to 90%.

Serologic Testing

Serologic testing is not timely and an immunologic response usually has not occurred when the patient presents with acute symptoms. Within two weeks following infection, IgM and IgG antibodies become measurable. The most common method, a polyvalent indirect antibody test (IFA), utilizes infected HL60 cells fixed to a microscope slide. A single acute-phase titer > 1:128 or a 4-fold or greater change in serum antibody titer between the acute and convalescent sera is diagnostically significant. Immunoblotting methods produce a consistent reaction to antigens in the P44 multigene family (MSP2). Studies have shown that serum antibodies in patients positive for Lyme disease in the absence of HGA do not appear to cross-react with 44 kDa HGA antigen, making the test fairly specific. Sensitivity for IFA testing and other serologic methods has been reported to be as high as 60%.

Treatment

Anaplasmosis is typically treated with oral doxycycline for seven days for patients eight years of age and older. Alternative treatment for younger children and infants includes rifampin. Clinical experience with alternative agents is limited.

Doxycycline is highly active against HGA in vitro and there is no documentation of resistance to date. If coinfection with *B. burgdorferi* is suspected, a longer duration of treatment (14 to 21 days) is recommended. In areas where Lyme disease is endemic, such as Menominee County, coinfection may occur in one-fourth to one-third of individuals. This will lead many physicians to treat all HGA patients with at least two weeks of doxycycline. Marked patient improvement and lessening of symptoms usually occurs within 48 hours of treatment. Absence of rapid improvement suggests another diagnosis or tick-borne coinfection not susceptible to doxycycline (e.g., babesiosis, etc.). Most patients do not require hospitalization and patients without severe complications or organ damage fully recover.

References:

1. Aguero-Rosenfeld, M. E., Wang, G., Schwartz, I. and Wormser, G. P. 2005. Diagnosis of Lyme Borreliosis. *Clin. Microbiol. Reviews*, 18.3:484-509.
2. Mitchell, P. D., Reed, K. E. and Hofkes, J. M. 1996. Immunoserologic evidence of coinfection with *Borrelia burgdorferi*, *Babesia microti*, and human granulocytic *Ehrlichia* species in residents of Wisconsin and Minnesota. *J. Clin. Microbiol.* 34:724-727. (Abstract).
3. Goodman, J. E., Dennis, D. T. and Sonenshine, D. E. (eds.) 2005. Lyme Borreliosis IN: Tick-Borne Diseases of Humans. pg. 176-206.
4. Goodman, J. E., Dennis, D. T. and Sonenshine, D. E. (eds.) 2005. Human Granulocytic Anaplasmosis (Ehrlichiosis) IN: Tick-Borne Diseases of Humans. pg. 218-238.

Please see *LabLink* Vol. 11. No. 3, Summer 2006, for the final installment of this case study.

Dr. Rudrik Receives the American Public Health Laboratories 2006 Emerging Leader Award



James Rudrik, Ph.D., has been awarded the Emerging Leader award from APHL for 2006. Rudrik was nominated by Frances Pouch Downes, Dr.P.H., Bureau of Laboratories Director, and Patricia Somsel, Dr. P.H. Infectious Diseases Division Manager, for his admirable commitment to the ideals of public health laboratory practice and his numerous contributions to the field. Rudrik joined MDCH in 2000 as Michigan's first Bioterrorism Training Coordinator for sentinel laboratories. In 2001, he became the microbiology section manager.

Some of his accomplishments cited in the nomination include providing the insight and direction for the first modular laboratory that provides the capacity for all-hazards handling of suspected terror specimens, working with the Michigan Department of Agriculture and the Michigan office of the Food and Drug Administration to develop a triage system for food sample testing and implementation of the Food Emergency Response Network (FERN) testing procedures, mentoring an APHL Emerging Infectious Disease post-doctoral fellow and developing, along with laboratory staff, a model for public health laboratories to support the investigation of vancomycin resistant *Staphylococcus aureus* (VRSA).

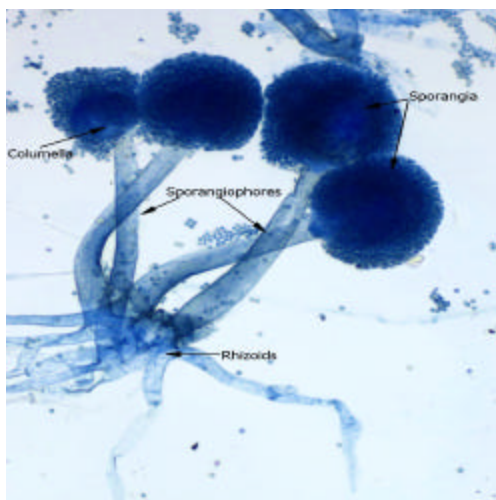
Dr. Rudrik would be the first to point out that all of these accomplishments are a collaborative effort with the staff of the microbiology section. However, his vision and dedication to these activities is an example, to public health and clinical microbiologists alike, of best practices in preparedness. Congratulations, Dr. Rudrik!

FUN FUNGI....

Rhizopus species

Sandy Arduin MT(ASCP) & Bruce Palma MT(ASCP) - Mycobacteriology/Mycology Unit

Rhizopus species are found worldwide and have been isolated from air samples, soil, and agricultural products such as corn, barley and rice. *Rhizopus* spp. are a common contaminant but occasionally cause rare, severe, infection in humans. *Rhizopus* infection occurs via respiratory, percutaneous, gastrointestinal, or oral routes; the most common being inhalation of spores resulting in rhinocerebral or pulmonary infections. It is a rapidly progressing infection that results in necrosis of tissues and infarcts (area of dead or dying tissue resulting from obstruction of the blood vessels) in the brain and lungs. Infection primarily occurs in patients suffering from diabetic ketoacidosis, severe burns or other immunocompromising conditions. Occasional cases involving immunocompetent patients have occurred. These cases typically involve an underlying trauma or surgical wound infection.



Rhizopus spp. typically grow very rapidly and have a cottony to wooly texture. Colonies are initially white, becoming grey to grey brown with age. Microscopically, brown sporangiophores are formed singly or in tufts (groups) from nodes directly above the brown pigmented rhizoids. Sporangiophores typically are not branched but may occasionally have a single bifurcation near the tip of the sporangiophore. Stolons are also present. Sporangia are globose, contain a columella, and are grayish to brownish with age. The apophysis is absent or scarcely apparent. Sporangiospores are hyaline to brown and striated or grooved.

References:

1. de Hoog, G.S., Guarro, J., Figueras, Gene & M.J. 2000. *Atlas of Clinical Fungi*, 2nd ed. Centraalbureau voor Schimmelcultures. Utrecht, The Netherlands.
2. St-Germain, Guy, Summerbell, Richard. 1996. *Identifying Filamentous Fungi, A Clinical Laboratory Handbook*. Star Publishing Co. Belmont, CA.
3. Ribes, Julie, Vanover-Sams, Carolyn, Baker, Doris. *Zygomycetes in Human Disease*. Clinical Microbiology Reviews. April 2000. pp. 236-301.
4. www.emedicine.com/MED/topic1513.htm
5. www.mycology.adelaide.edu.au/Fungal_Descriptions

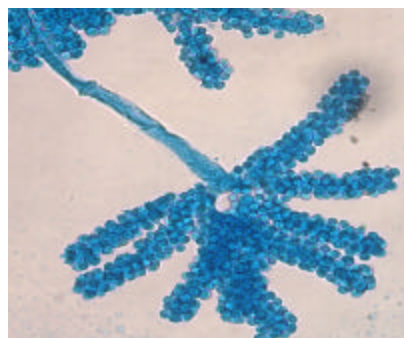
Last Issue's Picture Quiz Answer:



Myriodontium keratinophilum

Myriodontium keratinophilum is primarily a soil fungus. It is occasionally found in clinical specimens such as sputum, toenails and skin scrapings. Colonies are yellow-white, velvety or powdery, with a tan reverse. Microscopically, conidia are globose to sub spherical. Conidia are borne singularly at the end of a short peg that forms at right angles to the hyphae. These are formed over the entire surface of the hyphae. As the conidia mature the hyphae undergoes lysis.

This Issue's Picture Quiz: What Mould is this?



MDCH-BOL is Ready for Human Exposure to Cyanide (CN)

Paul R. Locanto, Ph.D.
Analytical Chemistry Unit

The CDC's Chemical Terrorism Laboratory Network (CTLN) includes preparedness for highly toxic chemicals are intentionally released. Inorganic salts, such as sodium cyanide (NaCN), potassium cyanide (KCN), and potassium hexacyanoferrate(III) (K_3FeCN_6) as well as numerous organic compounds that have carbon covalently bonded to a cyano group are available and accessible here in the United States. In nature, substances yielding cyanide (CN) are present in cassava plants and in certain seeds, such as the pits of wild cherries, peaches, and apricots. The presence of CN in tobacco smoke is an important public health concern. A person may have a concentration between 10 and 200 parts-per-billion (ppb) of CN in their blood, depending upon their diet. Symptoms such as tachycardia begin to appear when blood levels reach 1000 ppb or higher. Blood levels of 2500 ppb or greater, may lead to coma and possibly death. The LD_{50} (Lethal Dose₅₀: dose needed to kill one-half of test subjects) in mice and rats for hydrocyanic acid (HCN) is 554 ppm for five minutes of exposure (1). The half-life of blood cyanide, based on animal studies, is approximately one hour.

HCN is used to prepare acrylonitrile, an important component in the production of acrylic fibers, synthetic rubber and plastics. HCN is produced when many synthetic and natural (e.g., wool and silk) products burn, is a threat to fire fighters and fire victims. Cyanides are used in large quantities in many chemical processes including fumigation, case hardening of iron and steel, electroplating and in the concentration of ores (2).

CN is routinely monitored in environmental samples such as wastewater effluent using classical colorimetric techniques (3).

A unique, highly specific and sensitive trace analytical method based on static headspace capillary gas chromatography-mass selective detection with selective ion monitoring (HS-C-GC-MSD-SIM) has been developed and is a mainstay in the Division of Chemistry and Toxicology's arsenal of CTLN related analytical methods.

The method was developed at the CDC and transferred to participating state public health labs as part of the CDC's CTLN Level-2 Tech-Transfer Program (4). Michigan was one of the five original states selected to participate in the CTLN in 1999. MDCH has four years of practical, hands-on experience implementing this quantitative method, successfully participating in quarterly proficiency testing (PT) since 2004. Analytical results are reported on-line to the CDC. Recognizing the need for backup instrumentation, a second HS-C-GC-MSD was installed in 2005. Thirty-seven state, territorial, and municipal public health labs now have this analytical chemistry capability in the United States.

Recall what you learned in General Chemistry

Chemical principles that make cyanide salts potentially toxic are exploited in the analysis of whole blood to quantitatively determine trace concentration levels of CN by HS-C-GC-MSD-SIM. Alkali metal cyanide salts, when dissolved in water, release the cyanide anion, CN^- . CN^- is the conjugate base of the weak acid HCN. Since HCN is such a weak acid, CN^- is a moderately strong base. Acid dissociation constants, K_a are important physical-chemical properties of acids and bases and serve to indicate which acids or bases are strong or weak. Tables usually list pK_a which is mathematically defined as the

negative logarithm of the K_a . For example, hydrogen sulfide, H_2S , is a weak inorganic acid ($pK_a=7.02$, first dissociation constant, since H_2S is diprotic) and like HCN is also a gas. It is a slightly stronger acid versus HCN ($pK_a=9.21$). Hydrogen sulfide would also be amenable to quantitative analysis via HS-C-GC-MSD-SIM to determine trace concentration levels of sulfide such as in a terrorist event involving release of H_2S gas.

How do we measure the concentration of HCN in a patient's blood?

Whole blood that contains cyanide, after being acidified, releases the chemical as the weak acid HCN. HCN, a gas at room temperature, can be easily partitioned into the headspace of a sealed headspace vial containing the liquid matrix with dissolved HCN by raising the temperature of the liquid matrix to at least $65^\circ C$. The sealed vial is then agitated to yield a uniform concentration of HCN vapor in the headspace. This elevated temperature and agitation place enough HCN molecules into the headspace so that HCN can be retained on a specialized gas-solid chromatographic column using a PLOT Q column in the method. The mass of HCN (m/z 27) is detected by a quadrupole mass spectrometer. With a molecular weight for HCN of 27 daltons or atomic mass units, a mass spectrometer can be calibrated and set to that m/z ratio. When a molecular ion from electron-impact ionization of HCN molecules enters the quadrupole rods, this mass-to-charge ratio is allowed to pass through the rods to the detector. HCN that is isotopically enriched is added to the whole blood specimen prior to reagent addition enabling quantitation of target analytes based on isotope-dilution calibration techniques.

The process initially involves addition of chemical reagents that prevent loss of cyanide in blood platelets and release HCN from the blood matrix. The sample is vigorously agitated while heated to the set-point temperature. The headspace is sampled and injected into the

C-GC-MSD. This process is completely automated. The job of the analyst becomes that of a synchronized systems manager.

Both automated instruments are shown in the fisheye-view photo below.



For comments or questions about blood cyanide testing, please contact Dr. Paul R. Loconto at 517-335-9490 locontop@michigan.gov. For general comments or questions about the CTLN, please contact Marty Boehme, Interim Chemical Terrorism Laboratory Coordinator at 517-335-9654 or at boehmem@michigan.gov

References

1. The Merck Index, 13th edition, Merck & Co., 2001.
2. Murphy, K. et al. *Clinical Chemistry* 52(3), (2006), 458-467.
3. Method D2036 *Annual Book of ASTM Standards* Part 31, 1980, American Society for Testing and Materials.
4. Calafat, A. and S. Stanfill, *Journal of Chromatography B*, 722, (2000), 131-137.

Improving the Accuracy and Completeness of Cancer Pathology Sample Reports

Edited by David J. Saltman, MPA, RN
MDCH Cancer Prevention and Control Section

Michigan cancer patients and the laboratory facilities that serve them will both benefit from the results of the Michigan Cancer Consortium (MCC) project that expects to yield more accurate and consistent reporting of pathology samples. MCC's Basic Cancer Pathology Lexicon Project members, including leading Pathologists, Oncologists and Tumor Registrars from across the state, developed the List of Compiled Synoptic Templates for Most Common Cancers. These templates are based on key elements currently in use throughout Michigan for gross, microscopic, and biochemical reporting of pathology exams on breast, colorectal, and prostate cancers. Michigan is becoming a leader in facilitating and documenting the use of synoptic cancer pathology reports.

The implementation and use of these new templates will result in pathology reports that are more complete and uniform between facilities, and the resulting data will enable physicians to make more informed cancer treatment decisions and will provide health care policymakers, researchers, and analysts with accurate information that can be used in determining the cost-effectiveness of various health care measures.

What Was Done

Project members used a collaborative approach to obtain information, data, and feedback from pathologists, clinicians, tumor registrars, and administrators of cancer treatment facilities throughout Michigan. As one of the key steps in developing the templates, they solicited the input of pathologists who serve as directors of laboratories within Michigan that routinely report more than 250 cancer cases per year, requesting from each a list of elements the laboratory typically includes in its anatomical pathology reports for breast, colorectal, and prostate cancers.

After developing a format that includes all the scientifically mandated data elements required by College of American Pathologists (CAP), American Joint Commission on Cancer, and the American

College of Surgeons Commission on Cancer (ACOS-CoC), that was clinically usable, and user-friendly, team members created basic pathology lexicon templates, for breast, prostate and colorectal cancers and then expanded that work to create templates for all common cancer types. These templates were then pilot tested in dozens of facilities across the state. Survey results showed that the majority of pathologists and health professionals who pilot tested the templates found them to be both functional and of immediate value in improving surgical pathology reporting practices in laboratory facilities.

The Consortium is working with the Michigan Society of Pathologists and other stakeholders to ensure that the templates are up to date, consistent with the CAP Cancer Reporting Protocols, compliant with the ACOS-CoC Pathology Reporting Standards, disseminated to pathology laboratories and cancer treatment facilities throughout the state, and that their use and value is understood and widely promoted.

The MCC List of Compiled Synoptic Templates for Most Common Cancers have been endorsed by 1) the Michigan Cancer Registrars Association; 2) the Michigan Society of Hematology and Oncology; and 3) the Michigan Society of Pathologists.

The templates are available online and can be downloaded free of charge at http://www.michigancancer.org/OurPriorities/StandardizedLexicons_InformationForProviders.cfm.

Learn More

For more information about the MCC and its Michigan Basic Pathology Lexicon Project, contact the MPHI Cancer Control Services Program at 2438 Woodlake Circle, Suite 240, Okemos, MI 48864 (517-324-7300) or visit www.michigancancer.org.

Quirky Bugs.... CDC Group Ic

Beth Holben, MT(ASCP), Sandip Shah, MS, MT(ASCP), Steve Haskell, SM(ASCP)
Reference Bacteriology Unit

Life is never dull in the MDCH reference bacteriology laboratory. Everyday brings a new and unique challenge resulting, occasionally, in the rare find. In early 2006 the unit received an aerobic gram negative rod for identification. It had been isolated from a 67 year old patient with a lateral ankle wound. The only information given was that the isolate was oxidase and MacConkey positive.

After a 24 hour incubation period the isolate grew pinpoint non-lactose fermenting colonies on MacConkey agar and nonhemolytic, grey, shiny, opaque, circular, raised colonies on 5 % sheep blood agar. The Gram stain revealed medium straight gram negative rods. The organism was motile by means of a single polar flagella as demonstrated by a flagella stain.

Biochemically, the isolate oxidized glucose and maltose, was catalase and oxidase positive, reduced nitrate to nitrite without gas formation, was arginine dihydrolase positive, and produced a slight pinkish insoluble pigment. The gas liquid chromatography profile demonstrated distinct peaks similar to those of a Pseudomonad. After ruling out all *Pseudomonas* species and other similar organisms, the isolate was identified as CDC group Ic.

Other features of CDC group Ic are the ability to grow at 25° C, 35° C, and 42° C, growth on

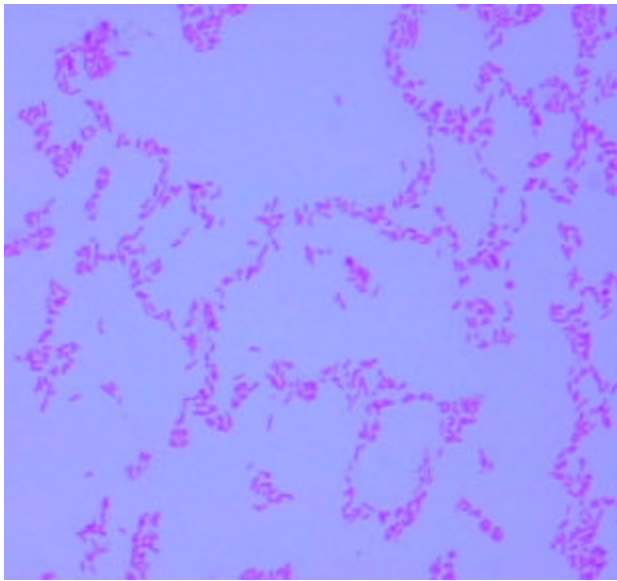
cetrimide and Salmonella Shigella (SS) agars, and positive H₂S by lead acetate paper method (usually a strong reaction). Reactions for citrate and urea are variable, gelatin and esculin are negative for hydrolysis.

Even though it is found infrequently, CDC group Ic has been isolated from a wide variety of geographic locations and sources. The most common sources include urine, sputum, and blood, but it has also been found in bronchial washes, wounds, bile, infected teeth, and peritoneal fluid.

CDC group Ic is a very unusual bacterium; so unusual that the CDC has no compiled data available. There is no literature available and no references found. To date, 16S ribosomal RNA studies have not been performed and antibiotic susceptibility data are not available. The clinical significance of this organism is also unknown at this time.

To learn more, listed below is the only reference currently available.

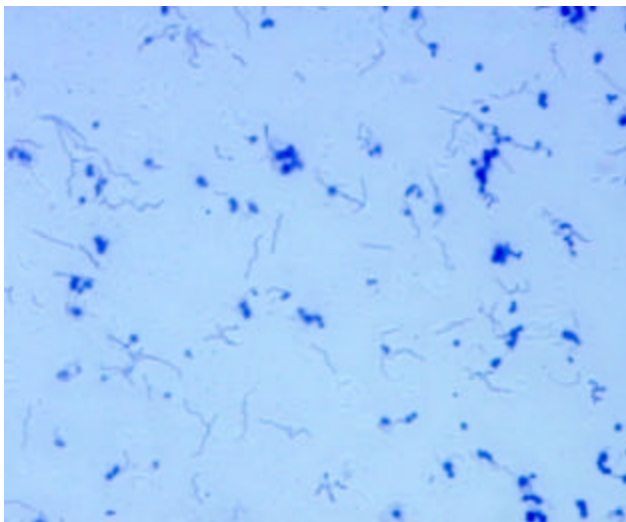
Weyant, R. S., C. W. Moss, R. E. Weaver, D. G. Hollis, J. G. Jordan, E. C. Cook and M. I. Daneshvar, CDC Group Ic, *Identification of Unusual pathogenic Gram-Negative Aerobic and Facultative Anaerobic Bacteria*, 2nd Edition, 1996, p. 550-551 Williams & Wilkins, Baltimore, Maryland.



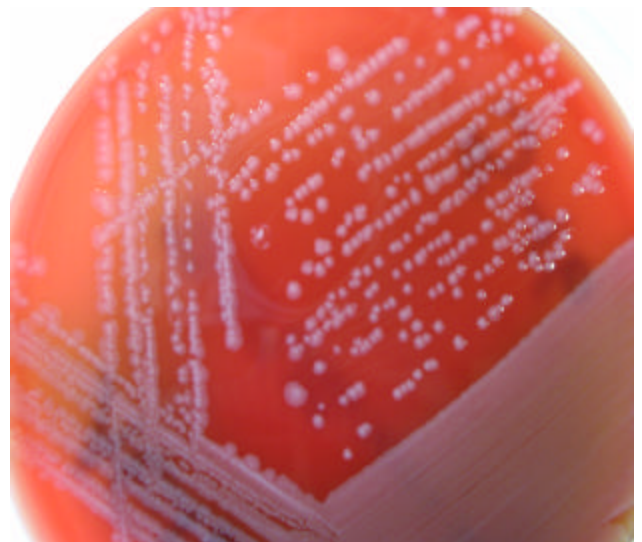
Gram Stain



Colony Morphology



Flagella Stain



Growth of 5% Sheep Blood Agar

LabLink is published quarterly by the Michigan Department of Community Health, Bureau of Laboratories, to provide laboratory information to Michigan health professionals and the public health community.

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