Spring 2014

Connections

ISSN 1496-3876

www.cmpt.ca

CMPT QUARTERLY ON-LINE NEWSLETTER

Volume 18 Number 1

CMPT's International EQA program - Delegates from Turkey trained at CMPT

Last February, international delegates Dr. Hakan Abacioglu, National Laboratory Expert affiliated with WHO Country office in Turkey and Dr. Selçuk Kiliç, Clinical Microbiologist with the National High Risk Pathogens Reference Laboratory, Ankara, trained at CMPT.

Dr. Abacioglu offers consultant services within the frame of a European Union project called Control and Surveillance of Communicable Diseases in Turkey. "There are three legs to this program," explains Dr. Abacioglu, "one is the field of technology training, the other is the early warning response system, and the third is laboratory strengthening." Helping the Turkish Public Health Agency to establish a National External Quality Assurance (EQA) program is part of this last objective.

Dr. Kiliç explains that as a reference centre for communicable diseases, they are currently trying to establish the External Quality Assurance system and establish proficiency testing (PT) programs in Turkey.

Turkey has EQA programs but they are related to surveillance programs; the EQA program is more of a competency testing for laboratories which are involved in the surveillance program. There are currently three programs up and running: tuberculosis, enteric pathogens, and antimicrobial resistance.

Dr. Kiliç feels that these programs need to be reviewed and restructured using the techniques that they have learned at CMPT. This would enable them to bring a fresh perspective to these programs. They expect to increase the number of cycles and incorporate some Gram staining and parasitology components.

Currently, the number of samples couldn't exceed two a year because of the way these programs are managed; there is no coordination among the PT laboratories as they are running their own programs.

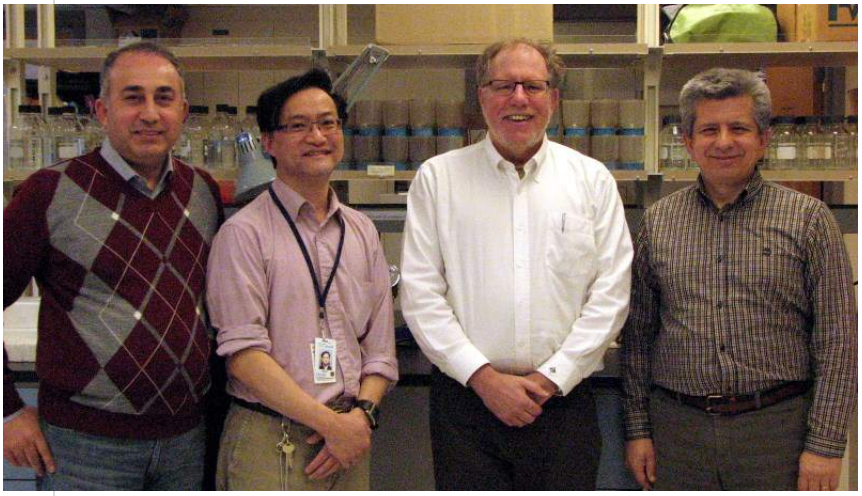
A unit for QA assessment has been established and lab space has been assigned for it. However, it is not functional as there are no people assigned to it yet. Although this unit will try to use the same protocols for sending the samples / packaging, etc., a better system with well-defined responsibilities and roles is needed.

Currently, the Ministry of Health requires the labs to have a PT program and although it is not required for university hospitals, almost all of them are somehow involved in a program. "At my hospital, a university hospital in Izmir, we have been using these programs for 15 years", Dr Abacioglu explains. The programs are however, from external providers such as UK NEQAS from the UK, CAP from the US, and INSTAND in Germany.

However, Dr Kiliç and Dr. Abacioglu feel that there is a gap in microbiology as most of the testing done is mainly serology. They are hopeful that the new EQA program will fill that gap.

Dr. Kiliç realizes it is complicated to establish a new EQA system. "Technically," he says, "it is not so complicated, but organization, establishing expert committees, management, and assuring program sustainability are very challenging tasks."

"Before coming to CMPT I thought it was much more complicated and that the technical part was more important, but now, I see that the management and sustainability are much more important than the technical part" says Dr. Abacioglu.



From left to right: Dr. Selçuk Kiliç, Caleb Lee Dr. Michael Noble, Dr. Hakan Abacioglu

IN THIS ISSUE

International EQA Training Program

Developing a National EQA program in Turkey is very important says Dr. Abacioglu, and after training at CMPT, he has a good idea about how to do it. He realizes research and development needs to be integrated into the system for a couple of reasons: one is for expansion into new programs and the other is because one can always face problems within an existing quality program, which need to be solved and this needs a research component. What is attractive to countries like Turkey is that CMPT's EQA model is simple but robust, but he recognizes that within the simplicity there is complexity and they need to learn through the process.

Both Dr. Kiliç and Dr. Abacioglu recognize that the major challenge they expect is not the setting of the lab, but setting up the experts, because it always comes down to people and qualified personnel. They realize that they need to find the right people for this, dedicated, with a good technical background, and ideally, able to communicate in English so they can share information and attend international meetings.

Although the transition from a well-known and used system may be an issue, they expect laboratories will welcome a program that is sustainable, organized, and most importantly, targets needs that are specific to Turkey such as brucellosis and leishmaniasis. There is also a language issue with the current programs and as a national program that could be provided for free or at very low prices they hope that laboratories will be very interested in the new EQA program.

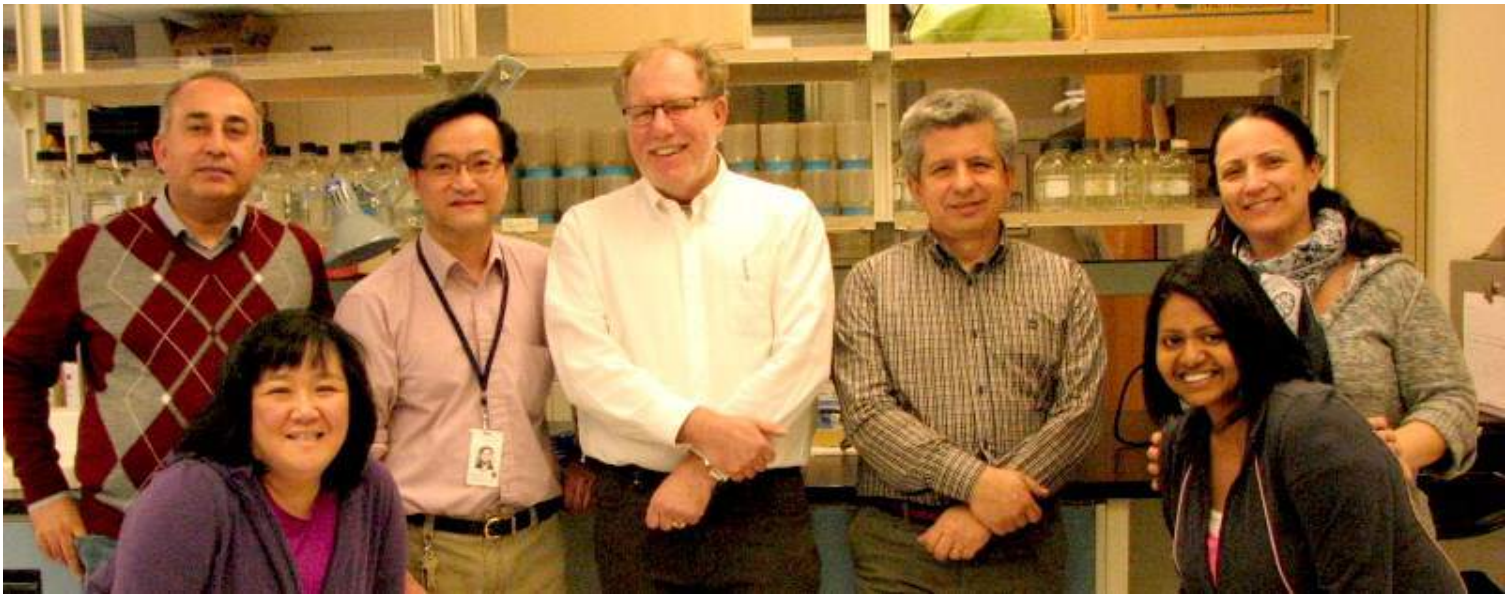
What is attractive to countries like Turkey is that CMPT's EQA model is simple but robust, but within the simplicity there is complexity .

Dr. Kiliç and Dr. Abacioglu also emphasized the importance of an educational component. They praised CMPT's critiques stating that they are practical, educational, and tailored to the labs' needs. They think that critiques will greatly help with the establishment of the program because people need education and this is the kind of thing people are actually seeking.

On the other hand, as member of the executive committee of the Turkish Microbiology Society, Dr, Abacioglu says he will also try to integrate the activities of the public health agency and the society to advocate for this program and to provide educational material.

"One of the things that you guys made us feel is that we wouldn't be alone, that you will always be there for us, and we can always come to you and you may help us through [any issues] so I, so far, got what I really aimed for, and I really appreciate that." Dr. Abacioglu.

Veronica Restelli, Editor



From left to right: Dr. S. Kilic, Esther Kwok, Caleb Lee, Dr. M. Noble, Dr. H. Abacioglu, Suhanya Bhuvanendran, Veronica Restelli

CMPT's International EQA program — Scientist from Saudi Arabia trained at CMPT

In April 2014, Dr. Mazem Krawi, a Microbiology and Laboratory Quality Management consultant from Saudi Arabia trained at CMPT.

Dr. Krawi explained that while there are many local PT providers for chemistry and hematology, Saudi Arabia's hospitals buy their microbiology proficiency testing from European programs.

He explains that this is not the ideal situation, as in microbiology, unlike chemistry and hematology, local epidemiology is a real issue. The ability to choose the challenges that apply to his country's needs is important.

Although there is no concrete plan yet to establish a local microbiology proficiency testing program in Saudi Arabia, Dr. Krawi's goal is to collect information, learn about CMPT's program and how to prepare samples, get some ideas and suggestions to put forward a proposal to the Health Authorities.

Dr. Krawi learned about CMPT mainly through our website and also through CACMID. He also applied for the Laboratory Quality Management course offered by our sister program, POLQM (Program Office for Laboratory Quality Management). He recognized that there are not many programs that offer the kind of training that CMPT offers.

As most of the international delegates training at CMPT, Dr. Krawi noted that the program as run by CMPT does not require a complex and expensive laboratory. He also recognized that getting the right people and the group of experts in the field could be the biggest challenge.

When I asked Dr. Krawi to give me his impression of CMPT he told me he had characterized our program in five points:

1. **Patient competency approach**: you are not only considering the competency of the laboratory but you are also including the patient's interest. Through continuing education, you use your critiques to communicate classification of organisms,

Dr. Michael Noble (left) and Dr. Mazem Krawi (right) at CMPT

> **... you are not only considering the competency of the laboratory but you are also including the patient's interest .**

you consider the labs' education and include classification, updates in resistance mechanisms, and more general competency needs that serve all patients.

2. **The clinical samples are simulated, not lyophilized**. We could provide our own samples for someone to practice, we would have to give them a culture to identify, but you provide clinical samples, with a clinical history, the objective is not only to isolate the organism. This approach is different from others.
3. **Expert consultation**: you are not choosing the challenges by yourselves but consult with many experts. That way, people working in the field select what they need.
4. **Consensus grading:** the grading is not done just by one person but by consensus.
5. **Educational approach**: you really, with your critiques, website, etc. have a strong educational approach.

We thank Dr. Krawi for his remarks; at CMPT we are proud to provide training that will ensure a sustainable local proficiency testing program in different parts of the world. As Dr. Noble puts it in his blog Making Medical Lab Quality relevant, "we … give them intensive training in producing samples and setting up a basic program that will allow them to start a program, select, produce, transport samples relevant to their setting."

Veronica Restelli, Editor

Colony Counts and Urine Cultures

By Denise Sitter

Approximately 10% of all individuals will have a urinary tract infection (UTI) at some point throughout their lifetime. UTI's account for 7 million office visits and more than 1 million hospital admissions every year[1]. Additionally, they are the most common of the hospital acquired infections, responsible for as much as 35% of nosocomial infections in some facilities[2].

In healthy individuals, the urinary tract above the urethra is sterile, however the urethra is normally colonized with many different organisms from the vagina, skin, perineum, etc. These commensal organisms have the potential to contaminate urine during the collection process.

Studies have shown that, depending on the host and type of infection, bacterial counts ranging from > 10^5 to ≥ 10^8 cfu/L can be significant. The lower colony counts are of particular importance in infants, catheterized patients, and situations where the urine sample has been obtained by invasive procedures. Because of this, urine cultures are always performed quantitatively and reported with the accompanying colony count, thus providing valuable information for the physician to distinguish between potential pathogens and contamination with commensal organisms.

The standard for quantitative bacterial culture of urine is the inoculation of 0.01 or 0.001 ml of specimen using a calibrated loop onto appropriate culture media. The SI standard in Canada, implemented in 1982, for the reporting of bacterial growth in urine is by the number of colony forming units per litre (cfu/L), using scientific notation (ie. 1 x 10^6 cfu/L). Variation in reporting of colony count units from lab to lab can cause confusion in interpreting test results for physicians who receive reports from different laboratories, which in turn could have a significant negative impact on the patient.

In 1996, the CMPT committee decided to standardize the reports for the urine challenges to a single format, and settled on the term " __ x 10^6 colony forming units per litre (cfu/L)." It was felt that working with a single unit structure reduced the opportunity for reporting errors. CMPT also recommended that laboratories consider standardizing the reporting for clinical samples in a similar fashion.[5]

"Reporting a colony count of 10 – 100 x10^6 cfu/l was graded as 4. Other reporting formats were considered unacceptable as they are not standard..."

CMPT sends out a minimum of one urine challenge every year. Above is a statement that has appeared on almost every urine critique since 2008. The reason being that on almost every urine challenge since 2008, there has been at least one participant, sometimes more, that reports the colony count in a non-standard format. This accounts to be 34 out of a total of 1,521 reports (2.2%).

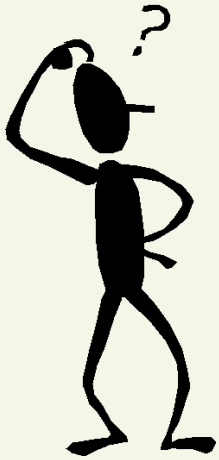
Among the variations seen on the reports received at CMPT are: 2+, 4+, moderate growth, >100 cfu/l, >100,000 cfu/L, 10,000-100,000 cfu/L and more. For most participants reporting in a non-standard way-was only a single occurrence. However seven participants submitted non-standard reports for several survey challenges. CMPT questions whether some of the non-standard reports received may be the result of inadvertent reporting errors based on misreading CMPT reporting form.

Reporting growth semi-quantitatively (2+, 4+) is not the equivalent of a colony count and provides little, if any, relevant information to the physician. Reporting the count as CFU/L in the absence of scientific notation may be technically correct, but can be easily misread, thus increasing the potential for a treatment error to be made. Laboratories are encouraged to review their reporting procedures for urine colony counts to determine if opportunities exist to improve reporting and reduce the potential for interpretation errors.

Denise Sitter,

ART Cadham Provincial Laboratory, Winnipeg, MB

Member of the Clinical Bacteriology Committee since 2007.



">100,000 col/10x3/L"

"2+"

">100,000 cfu/L"

"Moderate growth"

References

Pezzlo M, York MK, Church DL, In: Garcia LS, ed. Clinical Microbiology Procedures Handbook, 3rd Ed., Washington: American Society for Microbiology, 2007:3.12.1-27

Tille PM, ed. Bailey & Scott's Diagnostic Microbiology, 13th Ed., Elsevier Mosby, 2014:919-930

Baron EJ, Thomson RB Jr. In: Versalovic J, Carroll KC, Gunke G, Jorgensen JH, Landry ML, Warnock DW, eds. Manual of Clinical Microbiology, 10th Ed. Washington: American Society for Microbiology, 2011:261-262

MA Nobel, S Nikiforuk. Variability in urine culture reporting by Canadian microbiology laboratories. Can J Infect Dis 1996;7(4):247-249

Clinical Microbiology Proficiency Testing Newsletter: CMPT Connections 'On-Line' 2006:10.1

Mercury Safety

By Suhanya Bhuvanendran—CMPT's Safety Officer

Mercury is toxic to human health, posing a particular threat to the development of the child in utero and early in life. Mercury is a naturally occurring element that is found in air, water and soil.

Mercury is a hazardous chemical classified under both Class 6.1 (Toxic Substance) and Class 8 (Corrosive) under the Transportation of Dangerous Goods Act.

The health hazards of mercury have been studied extensively. The severity of its toxic effects varies depending on the route and duration of exposure, form (elemental, organic or inorganic) and concentration of mercury, and health and age of the person exposed[1].

Exposure to mercury can occur through inhalation, accidental ingestion or dermal absorption. Not all forms of mercury use all of these routes of exposures; inorganic mercury can be absorbed through skin and mercury vapors can be inhaled[2], mercury is quickly absorbed into the blood stream and can easily pass through the placental barrier[2].

In high concentrations, mercury was found to cause neurological, renal, cardiovascular and immunological problems in humans[2]. Accumulation of low quantities of mercury can cause neurodevelopmental problems in unborn fetuses and young children and infertility in adults[2].

Mercury does not break down in the environment and can accumulate in living organisms[3] and its vapors can remain in the environment for a long time and can be transported long distances by wind and water currents and by human transport.

Because mercury can cause both acute and chronic illnesses, it poses a work place risk for those personnel handling mercury or devices containing mercury. Where possible, it is recommended that devices with mercury be replaced with mercury-free devices. If mercury must be used, then the laboratory should be equipped with mercury spill-kit(s). Mercury spill-kits are available commercially through scientific suppliers. A facility may have to store more than one spill-kit depending on the size of the facility and/or the usage of mercury.

Personnel handling mercury containing devices should be trained on using the spill kit and disposing of mercury to help prevent further exposure. Regular maintenance checks of mercury containing devices and regular review of spill and clean-up procedures will help keep personnel informed and ready for mercury-related accidents.

Mercury and waste containing mercury is regulated as hazardous waste. Local municipal and city laws regulate disposal of mercury and may dictate how institutions must handle mercury waste[4]. Most institutions will have written procedures and protocols in place to handle accidental release of mercury, in accordance with the community's bylaws. Therefore, it is vital that all personnel using mercury or devices with mercury are aware of these safety protocols for their institution and understand their responsibilities in dealing with a mercury spill.

In the event of a spill:

If the spill is small (broken thermometer) and on a non-porous area you can probably clean it up yourself.

Larger spills should be reported to local environmental health authorities

DO

- Avoid spreading the spilled mercury!
- Block and evacuate area to prevent further exposure
- Refer to local guidelines and instructions on how to clean-up mercury spill as soon as possible

DO NOT

- ... use a vacuum cleaner as it would vaporize mercury into colorless, odorless gas, posing a risk for mercury poisoning by inhalation
- ... use a broom as it would break down mercury into smaller pieces making it easy to be transported by air or humans
- ... wash clothing and shoes that has come in direct contact with mercury in a washing machine as it would contaminate the washing machine and pollute the sewage system. Contaminated clothing and shoes should be discarded to avoid spreading mercury.
- ... autoclave or incinerate lab consumables that may have had direct contact with mercury as it would vaporize mercury

For More Information:

Mercury & its Health Effects: http://www.epa.gov/hg/index.html

Control small spills: http://www.ec.gc.ca/mercure-mercury/default.asp?lang=En&n=D2B2AD47-1

References:

1. World Health Organization. (2014). *Mercury and Health.* Web. Retrieved from: http://www.who.int/mediacentre/factsheets/fs361/en/

2. Jung-Duck, P., & Zheng, W. (2012, Nov). Human Exposure and Health Effects of Inorganic and Elemental Mercury. *J Prev Med Pub Health, 45*(6), 344-352. Retrieved from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3514464/

3. Health Canada. (2009, Mar). *Mercury and Human Health.* Retrieved from: http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/merc-eng.php

4. Environment Canada. (2011, July). *Spills, Disposal and Clean-up.* Retrieved from: http://www.ec.gc.ca/mercure-mercury/default.asp?lang=En&n=E8788167-1

National Medical Laboratory Week 2014

Join us in the celebration of the National Medical Laboratory Week, 2014 -April 20 - 26.

The lyrics of this song were written by Bev Borgford from Saskatchewan, former CMPT's Committee member to the tune of "Born to be Wild" by Steppenwolf. Thanks Bev!

Born to be Lab

Get your cultures goin'
QC's good today
Looking for some streppies,
But the Proteus is in the way

Born to be Laaaaab!!
Born to be Laaaaab!

The KPC are brewing
ESBL are too
The VRE complaining
Hey we're bad ass, not you!

Born to be Laaaaab!!
Born to be Laaaaab!

The wards are on the phone now
Interruptions! such a pain
The bugs cannot grow faster
Don't ask us that again.

Born to be Laaaaab!!
Born to be Laaaaab!

The panels are all ready
The red one needs a look
Oh why can't they just work out?
Oh right-the bugz don't read the book.

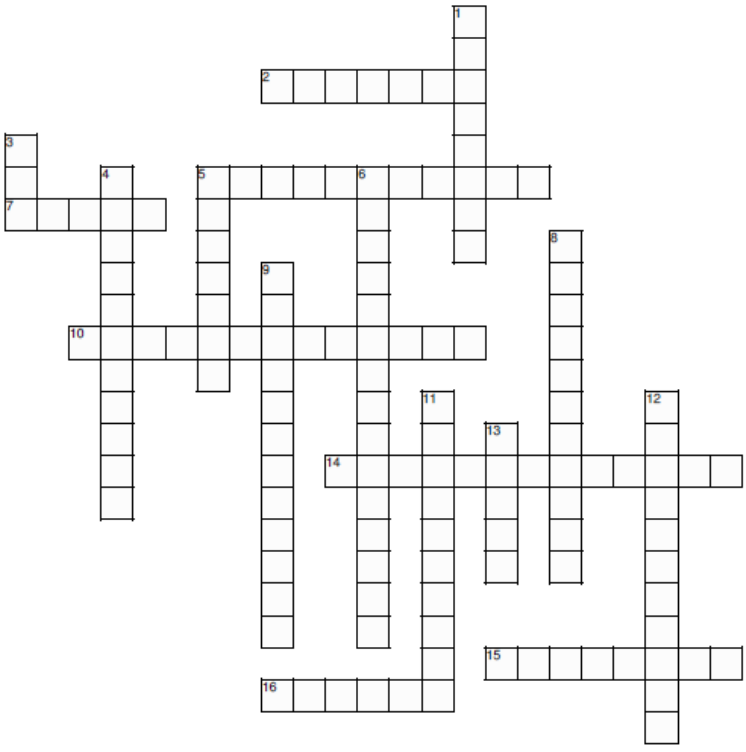
Born to be Laaaaab!!
Born to be Laaaaab!

And now the day is over.
The bugz have gone to bed.
Tomorrow is a new day.
Darn-this tune is in my head!

Born to be Laaaaab!!
Born to be Laaaaab!

CMPT's crossword

Complete the crossword below



Across

2. … sky blue, stain used to increase contrast between hyphae and epithelial cells in a direct fungal smear.

5. CMPT's newsletter.

7. Abbreviation, medium used to detect fluorescence of colonies in water microbiological analysis.

10. CMPT's EQA training program for participants from different parts of the world.

14. Phase of total laboratory testing process associated with the highest report of safety events.

15. Name of syndrome usually associated to *Fusobacterium necrophorum.*

16. Most common infection site for *S. pyogenes*

Down

1. Denomination used to report eggs of *A. duodenale* or *N. americanus.*

3. Abbreviation of water analysis method that uses different dilutions to semi-quantify organisms in water.

4. CNS species with similar pathogenicity than *S. aureus*.

5. Infectious disease internationally reported as part of International Health Regulations.

6. One of the most common etiologic agents of drinking water-related illnesses in Canada.

8. Recommended intrapartum therapy for patients with severe penicillin allergy and positive GBS screen test.

9. Fungus genus known as 'toxic black mold' associated to damp buildings or environments.

11. Component of a survival kit.

12. Commonly isolated dermatophyte.

13. Group of slow growing organisms, part of normal oral flora, associated with endocarditis.

Answers on last page

Get Connected

Upcoming Events

May 2014

24th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID)

May 10-13, 2014 Barcelona, Spain
More info: http://www.eccmid.org/

July 2014

89th Annual Meeting of the American Society of Parasitologists

July 24-27, 2014 New Orleans, Louisiana
More info: http://amsocparasit.org/node/79

IUMS—International Union of Microbiological Societies Congresses

July 27 – August 1, 2014 Montreal, Canada
XIV^{h} International Congress of Bacteriology and Applied Microbiology XIVth International Congress of Mycology
XVIth International Congress of Virology
More info: http://www.montrealiums2014.org

September 2014

54th ICAAC

September 6 - 9, 2014 Washington, DC
More info: http://www.icaac.org/index.php/meeting/icaac-2014

October 2014

III International Conference on Antimicrobial Research

October 1-3 Madrid, Spain
More info: http://www.icar-2014.org

ABOUT CONNECTIONS

"Connections" is published quarterly by CMPT and is aimed at the Microbiology staff.

Editor: Veronica Restelli

Contact Connections

By mail
Room G408, 2211 Wesbrook Mall,
Vancouver, BC V6T 2B5
Canada

By phone: 604– 827-1754
By fax: 604-827-1338
By email: restelli@mail.ubc.ca

Connections is available online:
www.cmpt.ca/newsletter_connections.html

We want to hear from you. Please follow the link to submit questions, suggestions, articles, information about events, etc.
www.cmpt.ca/newsletter_bulletin/news_submissions.htm

Answers to the Crossword

Across

2. Chicago
5. Connections
7. NAMUG
10. International
14. Preanalytical
15. Lemierre
16. Throat

Down

1. Hookworm
3. MPN
4. lugdunensis
5. Cholera
6. Cryptosporidium
8. Clindamycin
9. Stachybotrys
11. Flashlight
12. Microsporum
13. HACEK