MIMM BITES
A NEWSLETTER OF McGILL'S MICROBIOLOGY & IMMUNOLOGY DEPARTMENT
JANUARY 2015

WELCOME

FROM THE CHAIR'S DESK

Dear colleagues,

Welcome back everyone! I hope that you have all had a nice Holiday break with family and friends. The break provides a nice opportunity to re-invigorate and also to plan for the future. I hope that the start of 2015 has been exciting.

With the results in, I would like to share with you the tremendous success that MIMM 212 has had with the implementation of the Small World Initiative. Let me use this occasion though to congratulate Dre Samantha Gruenheid for her leadership role in this initiative and Simon Hernandez and all the students that contributed to this success. Well done! We look forward to the successful continuation of this project.

With 2015, we welcome Dre Mary Stevenson to the department. Dre Stevenson's office and lab will be located in Room 508. Her joining the department is a tremendous opportunity to expand our expertise and further nurtures collaborations. Welcome Mary!

On March 31/2015, Dr James Coulton will be retiring, after a 35-year career at McGill. To celebrate Dr Coulton's contributions, we will have a Mini-Symposium on the afternoon of February 20/2015.

Last, 2015 will also bring us an External Cyclical Review of the Department, scheduled for April 13-14/2015. Please, make sure to respond to Ms Maria Babiak if you would like to be scheduled in the itinerary of the reviewers. Your feedback is very important and I thank you for that in advance.

Have a wonderful year!

Yours in service,

Quim

RESEARCH

Publications

1. Evaluation of the immune response and protective efficacy of Schistosoma mansoni Cathepsin B in mice using CpG dinucleotides as adjuvant. Ricciardi A, Dalton JP, Ndao M. Vaccine. 2014 Nov 21. pii: S0264-410X(14)01541-2. doi: 10.1016/j.vaccine.2014.11.016. [Epub ahead of print] PMID:25448114

2. Research priorities for elimination of visceral leishmaniasis. Greg Matlashewskiemail, Byron Arana, Axel Kroeger, Ahmed Be-Nazir, Dinesh Mondal, Shan Golam Nabi, Megha Raj Banjara, Murari Lal Das, Baburam Marasini, Pradeep Das, Graham Medley, Abhay Satoskar, Hira Nakhasi, Daniel Argaw, John Reeder, Piero Olliaro. THE LANCET Global Health Vol. 2, No. 12, e683–e684, December 2014.

3. Production and analysis of immunomodulatory excretory-secretory products from the mouse gastrointestinal nematode Heligmosomoides polygyrus bakeri. Rajesh M Valanparambil, Mariela Segura, Mifong Tam, Armando Jardim, Timothy G Geary & Mary M Stevenson. Nature Protocols 9, 2740–2754 (2014).

FACES OF EXCELLENCE

Josée Chabot
Technician

How long have you been with the Department?

I have been with the Department since March 2005.

What is your job description (short biography)?

I am employed as a research technician in Dr. Don Sheppard's laboratory. When I first joined his team, 9 year ago, there was no team! I assisted Dr. Sheppard in setting up the laboratory and training our first students. Once the laboratory was up and running, I spent most of my time at the bench, conducting experiments for my research projects, as well as assisting students on their own projects. I was involved in a lot of protocol development and optimization. In the past few years, the laboratory has grown substantially, so the majority of my time is now dedicated to managing the laboratory finances and administrative matters and participating in grant proposal preparation...although I still enjoy every minute I get working at the bench! These last 6 months, I have also had to coordinate preparations for our upcoming move to the Glen campus.

What do you look forward to when you come to work every day?

I look forward to working with my lab colleagues. I am lucky to be part of a very cohesive team, which really enhances my work environment. I also look forward to learning new things every day; it is very stimulating to work an academic institution and to be surrounded by bright and inquisitive people. I also love that every day is different and brings its own challenges.

SERVICE

Duff Biobar Updates

BioBar Hours
The operating hours for the BioBar are the following: between 8-12 and 1-4.

Don't forget the Biobar Stocks Useful Lab Supplies such as:

- Kleenex;
- Bleach;
- Gloves;
- Paper Towels;
- Etc.

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If you would like to get a list of products available at the BioBar, please contact Tom Ringer at tom.ringer@mcgill.ca.

ANNOUNCEMENTS

- As of January 1, 2015, Professor Mary Stevenson is joining our Department as a Tenured Full Professor, jointly appointed with the Department of Medicine.
- The results of the Internal Funding Competitions have been announced. The Radcliffe awardees are Drs Martin Richer and Selena Sagan. The MDTC awardees are Drs. Sylvie Fournier and Ji Zhang, and Drs Irah King, Maz Divangahi and Dick Menzies.
- The Small World Initiative implemented by Dre Gruenheid in our MIMMM 212 has been a resounding success. To read the newsletter that Simon Hernandez has worked very hard to complete click here. It details some of the successes we are seeing as this program spreads across the globe. I hope that you will notice Simon's attempt to emphasize the student contribution to this program. We have over 1,100 students participating in the SWI this semester, and we expect more this winter. What a tremendous success we are experiencing. Feel free to share this newsletter with your colleagues, administrators, and anyone who expresses an interest in implementing the SWI in their lab. (To return to The Chair's Desk click here.)
- The wait is over!! The grand opening of our new MIMM LOUNGE took place on December 2, 2014 at 11am. Open 24/7, D12 is the new lounge for Faculty, Staff, and Graduate Students to meet, eat & relax.
- There is a new class/conference room available in the Duff: D13. D13 can accommodate up to 21 people and is AV equipped.
- A Mini-Symposium to celebrate Dr J. COULTON's retirement will take place on February 20, 2015 at the Faculty Club. As the space is very limited, we ask you to confirm your participation as soon as possible. RSVP to Mr Patrick Ritchie. (To return to The Chair's Desk click here.)

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Aero View Postcards

The first person who emails Patrick Ritchie with the date the following pictures were taken will win a surprise!

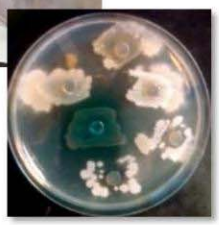
UPCOMING

INTERNATIONAL SYMPOSIUM ON HUMAN IMMUNITY AND THE MICROBIOME COMING TO MONTREAL IN 2015. As a result of a partnership between Cell Press (Elsevier) and the CIHR Human Immunology, we are proud to announce the celebration of an International Symposium on Human Immunity and the Microbiome in Health and Disease coming up in September 27-29, 2015. For further information, click here.

You are all encouraged to submit any news, grants, papers, awards, pictures, or items that you want to include to our monthly newsletter. We will be happy to share them with the rest of the department. You can email them to office.microimm@mcgill.ca.


Small World Initiative
crowdsourcing antibiotic discovery
Center for Scientific Teaching ▪ Yale University
Yale University
Center for Scientific Teaching
Yale
cst.yale.edu
Fall 2014 Newsletter
❖ Iowa State Univ.'s Cyclones Develop New Antibiotic Assay Called "CLONE ZONE"
❖ 105 Students and 2,500 Isolates: McGill Univ.'s Systematic Approach to Crowdsourcing
❖ Featured Student: Chad Coarsey from Florida Atlantic Univ.
❖ Fall Highlights:
▪ Video Production for SWI YouTube Channel
▪ Students Rule! Sampling an Unexplored Cedar Glade
▪ Raising Awareness at the North Carolina Museum of Natural Sciences
▪ Students to Present at the AAAS Annual Meeting
▪ Taking the SWI Exhibit on Tour across Connecticut
❖ About Small World Initiative
Cover Photo: Student collecting soil sample at Iowa State University

ISU's Cyclones Develop New Antibiotic Assay Called "CLONE ZONE"



Across the map, Small World Initiative students are devising new strategies to screen their soil bacteria for antibiotic activity. The screening process is akin to the discovery of penicillin, in which Alexander Fleming observed a zone of inhibition produced by the *Penicillium* mold. Yet every SWI student learns that there are many ways we can visualize scientific data. At **Iowa State University**, the Cyclones (the school mascot) have developed a new protocol called "CLONE ZONE," which allows them to observe antagonistic-interactions between soil bacteria and the tester strains (safe-relatives of clinically-relevant pathogens) grown under different culture conditions. The students, led by microbiology and plant pathology lecturer Claudia Lemper, grow their isolates in patches and then plug the patch with the end of a sterile Pasteur Pipette. This produces a core infused with the secreted metabolites, analogous to a Kirby Bauer disc, which is subsequently placed on a lawn or patch of the tester strain. The tester strain is then incubated at its optimal temperature or oxygen environment and later screened for inhibition, which would indicate the presence of antibiotic activity. This protocol provides yet another creative way of visualizing zones of inhibition that resembles art, with all the rigor of science.

Goal #1: Increase the retention of undergrads in science

Goal #2: Train students to apply the scientific method

105 Students and 2,500 Isolates: McGill's Systematic Approach to Crowdsourcing

Samantha Gruenheid's class of 105 students at **McGill University** in Montreal, Canada, has no reason to despair. The class is split into lab cubicles of about 12 students each led by a teaching assistant. This fall semester, they collected soil samples from urban and suburban Montreal and cultured a whopping 2,500 bacterial isolates! The students work in pairs to prioritize two isolates for characterization. Recently, they obtained DNA sequences from the 16S ribosomal RNA genes of these isolates and identified various genera of potentially novel antibiotic-producing bacteria, including ones they had never heard of before. Among them were *Brevibacillus*, *Chryseobacterium*, and *Dyella*, a genus of bacteria that was recently discovered in Tokyo, Japan. Their isolates, many of which were isolated using Potato Dextrose Agar medium, were evenly split between Gram-positives and Gram-negatives. Gram-positive bacilli and actinomycete species typically predominate in traditional bacterial isolations, which skews the biodiversity students are able to observe. Their strategy sheds light into the culture conditions and techniques we can use to recover more diverse bacteria in the soil. Dr. Gruenheid joined Small World Initiative this past summer and is a professor of microbiology who studies host-pathogen interactions. "We're having so much fun, I love the course!" she said, speaking for herself as well as her students.

Goal #3: Inspire the scientists of tomorrow

"Replace standard laboratory courses with discovery-based research courses"
- PCAST, Engage to Excel Report (2012)

Featured Student: Chad Coarsey from Florida Atlantic University

If you subscribe to the Small World Initiative Facebook Group, you've probably seen many posts from Chad Coarsey, a bioengineering student at **Florida Atlantic University**. From Gram stains to agarose gels to extracts fluorescing under UV light, his posts are instructive and analytical, expressing the thrill of discovery-based research. Originally from North Carolina, Chad was drawn to FAU's tropical climate, where he boasts of going to the beach between classes. Yet, things didn't go so well at the beginning of college, when he was faced with a drug-resistant nosocomial infection that almost cost him his life. After a year long recovery, he became interested in understanding microbial virulence and the mechanisms of antibiotic resistance. He was determined to help combat the growing number of multi-drug resistant pathogens. In summer 2013, he took a microbiology course taught by Dr. Joseph Caruso and continued to do research with him, studying drug resistance in the human skin microbiota. When Dr. Caruso introduced Small World Initiative to FAU, he was thrilled to join the project. Chad, who has a congenital amputation of his left arm, developed his own aseptic technique allowing him to use only one hand. He feels that the independence he gets from the course has allowed him to become more efficient as a student and scientist, and has taught him patience. "Small World Initiative has sparked innovation in my academic life," said Chad. In the future, he will be pursuing further research in the M.S. Bioengineering program at FAU, and plans to explore novel antibiotic-producer screening technologies.

"Small World Initiative has sparked innovation in my academic life ... " – Chad Coarsey, FAU

Fall Highlights

Producing Videos for SWI YouTube Channel. In the photo, students dig through ice and snow to collect soil samples at **Brigham Young University-Idaho**. This marks the beginning of the research project. Led by professor and program coordinator Todd Kelson, the BYU-Idaho class is producing short instructional videos of Small World Initiative protocols. The videos will be available on a SWI YouTube channel and the SWI website soon, along with materials produced by students, instructors, and collaborators. Dr. Kelson, who recently presented the program at the National Association of Biology Teachers Conference, has gotten a lot of approval from the school administration for running his lab at $16 per student! He is also pleased with the impact of SWI at his institution as new students tell him that they can't wait to take the course. Dr. Kelson was recently awarded a BYU-Idaho faculty of the year award partly for his work with the SWI!

Sampling a Cedar Glade. Students at **Middle Tennessee State University** collectively decided to sample soil from a single location: a poorly studied cedar glade that's a central part of the local ecosystem. Their instructor, Robert Seig, is thrilled by their cohesive dataset, which will be the first to unravel the glade's microbial diversity.

Raising Awareness. Students at **North Carolina State University**, led by professor Alice Lee, presented their posters at the North Carolina Museum of Natural Sciences on November 13, 2014, as an outreach effort to raise awareness about antibiotic resistance. This museum features labs with glass walls for the public to see researchers in action.

Presenting at AAAS Meeting. Tammy Yeagley, Caleb McNeal and Kassia Valverde from **National University** will present their poster at the AAAS 2015 Annual Meeting, taking place in February 2015. Their class, led by professor Ana Barral, has been optimizing chemical extraction and screening protocols.

SWI Exhibit. In the photo, Barbara Murdoch from **Eastern CT State Univ.** is shown presenting the SWI Exhibit at the United Nations in August. In 2015 she will take the exhibit on tour with Eric Patridge and Simon Hernandez across CT, with the support of the **Institute for Life Sciences Collaboration.**

Fall 2014 Newsletter — Small World Initiative

About Small World Initiative

Small World Initiative is an innovative research collaborative that brings a unique combination of science education, scientific research, and science diplomacy to college classrooms. Using authentic research as inspiration, this initiative focuses on addressing a worldwide health threat: the diminishing supply of effective antibiotics. Students are challenged to discover new antibiotics produced by soil bacteria isolated from local environments. This research program provides a platform to investigate biological and chemical diversity in soil. It also integrates the core antibiotic discovery project with foundational biology concepts to create different introductory courses.

Who We Are

Jo Handelsman
Founder
HHMI Professor
MCDB, Yale

Todd Kelson
Coordinator
Biology Professor
BYU-Idaho

Eric Patridge
Natural Product Chemist
Center for Molecular Discovery, Yale

Jenny Frederick
Principal Investigator
Executive Director
CTL, Yale

Simon Hernandez
Communications
Postgraduate Associate
MCDB, Yale

Christine Pribbenow
Program Evaluator
WISELI, University of Wisconsin at Madison

Second cohort of partner instructors, or SWIPIs, at the training workshop from June 22 to 27, 2014.

How to Join

- **Lab manual and teaching materials will be provided free of charge as a digital download in summer 2015**
- **Instructors agree to follow the participation guidelines, complete all of the experiments, and submit scientific and pedagogic data**
- **Visit our website: http://smallworldinitiative.org/**
- **Join our Facebook Group for frequent updates: Small World Initiative: Crowdsourcing Antibiotic Discovery**

Third cohort participating in the online training workshop from June 30 to July 3, 2014.

Supporters

AMERICAN SOCIETY FOR MICROBIOLOGY

the Institute for Life Sciences Collaboration

Send requests to Todd Kelson: kelsont@byui.edu
For more information about materials contact Simon Hernandez: simon.hernandez@yale.edu

Funding

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