



PLEASE JOIN US FOR: Graduation Tea MONDAY MAY 30, 2016 12:30 PM - 2:30 PM LIFE SCIENCES CENTRE WEST ATRIUM 2150 HEALTH SCIENCES MALL LIGHT SNACKS AND BEVERAGES WILL BE SERVED

Dear Alumni In This Issue

We love to hear from you! Let us know what you are doing and anything else we can share with your fellow Microbiology and Immunology students. Please contact our Alumni Engagement Coordinator - Dr. Farvin Bolourani, parvin@mail.ubc.ca.

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A Message From the Head

By Dr. Mike Gold



These days, every organization needs to have a catchy vision statement that describes its objectives and guides its actions. Some organizations will have "visioning" retreats or hire "vision consultants", but all kidding aside, it is important to articulate what you are trying to accomplish. When we wrote a self-study document in 2014 for the purpose of an external review of the department, we came up with a rather boring vision statement: "To be leaders in realizing the vision and missions of UBC through our research, education, and community engagement activities". Obviously we didn't hire any consultants. However, we went on to expand on this vision by describing our mission. Looking back at this mission statement, not only do I think that it's pretty good, but that we ought to re-read it on a regular basis and take stock of how we are meeting these goals.

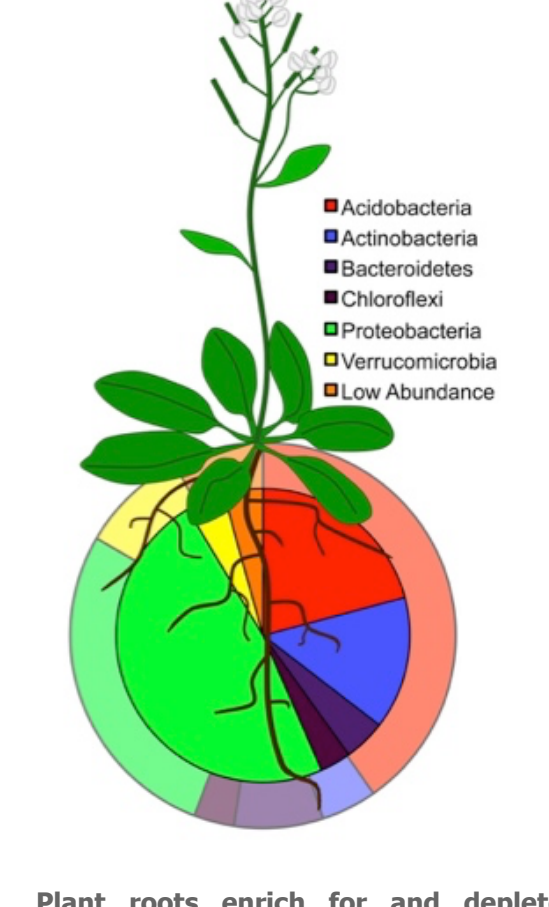
More from Mike Gold...

The Haney Lab

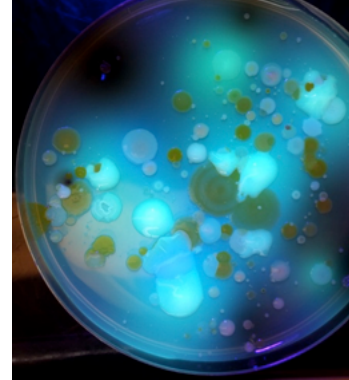
By Dr. Cara Haney

As the newest faculty member in the department, I (Cara Haney) am excited to announce that the Haney Lab is (mostly) open for business.

Launched in February 2016, the Haney lab studies the association of plant roots with beneficial soil microbes (the "microbiome"). Just as the microbes found in our gut affect our health, the plant microbiome is integral to plant health. These microbes promote plant nutrient uptake, affect plant growth, and can improve plant disease resistance. We study the plant model Arabidopsis and its natural symbiotic microbes including Pseudomonas fluorescens (which is fluorescent on certain growth media). This genetically tractable system provides unique opportunities to dissect how host and microbial genetics interact with the environment to determine microbiome structure and function. These areas of study are highly relevant to increasing agricultural sustainability by reducing the need for pesticides and fertilizer.



Plant roots enrich for and deplete (inner circle) specific microbes from the soil (outer circle). These microbes provide benefits to their hosts including pathogen protection and growth promotion.



Many microbes isolated from the roots of Arabidopsis plants growing wild in the Vancouver area are easily culturable and genetically tractable, including the easily identified Pseudomonas fluorescens (fluorescent colonies shown here).

Our lab is physically located within the Center for High-throughput Biology/Michael Smith Labs, which enhances the biotechnology component of our work. Finally, as we are adjacent to the Department of Botany, our work will hopefully create new synergies between micro, biotechnology and plant biology groups.

With the help of several Microbiology students I have begun expanding my current microbiome collection to include new strains of beneficial microbes from the Vancouver area. Arabidopsis grows wild locally, and is a close relative of agronomically important Canadian plants including camelina, kale, and canola. By isolating microbes that have adapted to both the local environment and to a close relative of these crop plants, we hope to identify new microbes that will be useful in local agriculture.

Here at UBC, I'm excited about the new colleagues and connections that will add depth and breadth to our research. M&I is emerging as a leader in microbiome research and several faculty members are asking similar questions in animal systems.

The Hancock Lab

By Dr. Bob Hancock

The Hancock lab is engaged in the following pursuits:

We are making progress in understanding a form of antibiotic resistance termed adaptive resistance which depends on the growth conditions, e.g. the formation of biofilms. Biofilms, organized bacterial colonies on surfaces, are a great example since they represent two thirds of all infections and are highly adaptively resistant to essentially all conventional antibiotics. We are also heavily engaged in utilizing computational approaches (databases and novel tools collectively termed bioinformatics) to understand inflammatory diseases. We have produced popular databases and analysis tools www.InnateDB.ca and www.NetworkAnalyst.ca and have used these to understand the innate immunology and inflammatory nature of the diseases sepsis, vasculitis, cystic fibrosis, arthritis, bacterial infections and early childhood responsiveness to vaccination.



We use a special brand of informatics termed Network Biology in which the complex machineries of cells are viewed as Networks and this has resulted in huge insights into these diseases in collaboration with our colleagues in Vancouver, Harvard, Gambia, Guinea-Bissau, Western and South Australia, and Winnipeg. We have been creating novel therapies to deal with multiple drug resistance in bacteria and with the above-mentioned inflammatory diseases, involving small peptides from Nature that we are developing as immunomodulators, anti-biofilm agents and more recently anti-cancer drugs. Finally we just received a very large grant from Genome Canada to use so-called reverse vaccinology to create new vaccines for cattle diseases, especially John's disease and bovine tuberculosis. We are excited about the practical applications of our research and Bob recently formed two new companies, Sepsinet (sepsis diagnostics) and ABT Innovations (peptides as immunomodulators, anti-biofilm agents, vaccine adjuvants and anti-cancer drugs). Excitingly our antibiofilm technology was actually on the front page of Reddit for 6 hours and was covered by Science on Friday, the top US radio show on science.

MISA Student Association

By Shervin Mortazavi

Year after year, through dedication and persistence, the MISA executive team continues to show their love for this wonderful department. With a team of highly passionate second, third, and fourth year students, we've worked hard this year to support all Microbiology and Immunology Students.

Building on the success of last year, we held our own careers night: an event dedicated to exposing undergraduate students to a mix of academic and non-academic career paths and experiences related to their major. Additionally, in collaboration with other clubs we also helped to put on the Annual Health Sciences Research Night.

One of MISA's most important goals is to create a friendly atmosphere for all the students of MBIM, a community they can be proud to belong to. We started the year on the Nest Rooftop by holding one of our most successful ice breaker events to date. Throughout the year we continually provided students with social events such as movie, board game, and sushi nights in an effort to bring students together, particularly after stressful exam sessions!

We have one of the best communities at UBC! Everyone in our department, including students, staff, and faculty, are genuinely friendly and welcoming people. So much of what I've accomplished as well as the friends that I have made, I owe to this department. It's been an honour and privilege to have served MISA as President this year.



Mike Gold continued...

OUR MISSION:
Research: To carry out cutting-edge research in microbiology, immunology, virology, and related areas in order to gain mechanistic insights into the function and dynamics of microbial communities, the immune system, host-microbe interactions, bacterial physiology, and global ecosystems. To translate this knowledge so as to impact human health, disease prevention and treatment, environmental practices and policies, and the development of environmentally sustainable biotechnology processes.
Education and training: To provide an outstanding educational experience at the undergraduate and graduate levels that provides our students with conceptual understanding, critical thinking and communications skills, and practical experience. To provide our graduate and postdoctoral research trainees with outstanding research opportunities, mentoring, and opportunities to develop independent career skills. To foster a broad appreciation of the roles of microbes and immune cells in health and disease; the roles of microbes and microbial communities in the environment; and the potential to translate microbiology and immunology research into advances in medicine, biotechnology applications, and environmental practices. To give our students and trainees, the tools that they need to pursue science-related careers and become leaders in those areas.
Community engagement: To convey to the public the importance of our research fields in their daily lives and inform them of important research advances. To develop the next generation of scientists by conveying the importance and excitement of science to elementary and high school students. To engage our alumni as active members of our departmental community who serve as mentors and role models for current students.

How are we doing? I think we're doing very well! Briefly, and to highlight just a few of our successes --

Our researchers have pioneered the development of new fields. I continually need to learn new concepts, acquire new vocabulary words (e.g. gnotobiotic, geomicrobiology, pathogenomics) and become familiar with a very rapidly expanding menagerie of emerging pathogens, bacterial regulators and virulence mechanisms, immune cell subsets, cytokines, host defense peptides, and CD molecules (there's an app for that -- really! We're up to CD350, which FYI is also known as Frizzled-10).

Our instructors are discussing the very latest research breakthroughs in their courses and are developing exciting active-learning approaches that engage the students. In addition to learning scientific concepts, we want our students to develop excellent communication, organizational, and leadership skills. Because oral presentations are a large part of our 4th year and graduate courses, I've heard many comments over the years about the students coming out of M&I are highly skilled presenters.

We are continually looking for new ways for our students and post-docs to develop leadership skills. In this regard, MICB 421/MICB 447 instructor Dave Oliver has created new opportunities for our trainees by taking Bill Ramey's brainchild, the Journal of Experimental Microbiology & Immunology (JEMI), to a new level. JEMI+ will publish the top papers from the MICB 421 and MICB 447 lab courses as well as undergraduate microbiology and immunology research papers from anywhere in the world. M&I graduate students and post-docs will serve as reviewers, editors, and copyeditors of this new journal.

Our undergraduate and graduate students are so much more advanced and engaged than when I was their age! Our graduate students continue to receive major scholarships and awards, and have achieved great success in the next steps of their career. I really enjoy it when one of our Biotech trainees tells me how much they like their program and I can tell them that many of their BCTI instructors are former M&I graduate students.

This year's cohort of undergraduates was extremely impressive. MISA continues to build a supportive and fun academic and social community that enriches the undergraduate experience for our majors. The Undergraduate Research Organization (URO), which won UBC's Helen McCrae student service award this year, developed a research mentorship program that connects 200 undergraduates to graduate student and faculty mentors. They also sponsor a very successful annual Life Sciences "Get into Research" event that now attracts 400-500 students.

Department members have been very active in giving public talks about timely subjects, such as how your microbiome affects everything. The annual World Tuberculosis Day symposium continues to bring together basic researchers, health practitioners, and members of the public to discuss the latest advances and challenges. For the annual Day of Immunology (April 29), we bring three 5th and 6th grade classes to the Life Sciences Centre. Our trainees engage them in hands-on activities and demonstrations that inform them about how infectious diseases are spread and how the immune system, with the aid of vaccines, protects them.

Can we do even better at meeting the goals set out in our mission statement? Absolutely! To guide us, maybe we need a more inspiring vision statement. How about, "To foster the development of students, research trainees, and faculty members who have the passion and skills to make the world a better place, each in their own way." I'll go with that one.