Greetings, CMB alumni, students, and faculty. Thank you for taking the time to catch up on the past year’s happenings in the CMB Program. The transcript highlights the research of CMB students and faculty as well as activities aimed at enriching student training. Current CMB students have written three of the articles. Rup Chakravorty has written about the work of Robert Ihry and Saheed Imam, who were the first recipients of the CMB Exceptional Thesis Award. This annual award honors CMB students who have written and defended exceptional theses. Robert and Saheed each received $250 as well as a plaque, and their names were added to a plaque that hangs in the Bock Penthouse. Joseph Bruckner chronicles a day in the life of CMB students. This article is accompanied by a group of photos. Lastly, Nasim Jamali describes the mock interview workshop that was organized by the student-run Professional Development Committee. Workshops organized by the Professional Development Committee are at the center of CMB’s efforts to provide students with the information and tools they need to identify and realize their career goals. We encourage CMB alumni to become involved in these efforts.

Please contact the CMB office, (cmb@bocklabs.wisc.edu) if you would be willing to discuss your career path with current CMB students. In closing, I hope that you enjoy reading about the amazing accomplishments of CMB students and faculty.
I believe the CMB and Graduate School’s professional development events are great ways to get exposed to the future opportunities, and the mock interview is the best finish to practicing what we have learned in these events in a professional setting.

Current students, if you are interested in planning for the next Mock Interview Event, please contact Jessica Skarlupka at cmb@bocklabs.wisc.edu.

Here are some useful links that I hope it could help you through your preparation:

- Resume Resource: http://www.resume-resource.com/
- Distinctive Documents: http://www.distinctiveweb.com/example-projects/sample-resumes/
- Blue Sky Resumes: http://www.blueskyresumes.com/

And don't forget to check here for the upcoming professional development events:

- http://cmbprodev.blogspot.com/
- http://grad.wisc.edu/pd/

Cheers!
- Nasim Jamali

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Mock Interview Event
by: Nasim Jamali, CMB Graduate Student

INTRO
It's scary, isn't it?
During our training we don't have enough opportunities to prepare ourselves for post-graduation, especially if we want to consider our options outside of academia.

We've always been told to prepare for the day to come! But HOW?!

This was my question and I started looking for an opportunity to prepare myself and practice for it, but I couldn't find much help for graduate level students on our campus. I started to look more carefully for opportunities to practice and was hoping one day I could practice in a professional setting before entering the actual interview.

I came across the community of practice group at the graduate school and I met Sharon Dubois, a recently graduated student in the Neuroscience Training Program (NTP). I shared my concerns with her and she was also feeling the need to prepare for this important phase in our lives. So we started pursuing this dream of ours slowly until I had a meeting with Jessica Skarlupka and we discussed the idea of adding an event at the end of CMB's professional development series and make it a complete series of events by finishing with a Mock Interview opportunity for students to practice. The goal of this series is to prepare students for opportunities after graduation and to prepare them for an interview. At the end we would hold a mock interview session for them to practice the skills they learned.

Sharon and I with great help and support from Jessica Skarlupka and Mallory Musolf, our CMB and NTP program coordinators, started planning for this event.

After asking the CMB and NTP students about their interest in a survey, Sharon and I started reaching out to the interviewers of different fields outside of academia from government, biotech companies, intellectual property and start-ups. As we reached out to people and invited them as our interviewers, we realized there are even more opportunities out there!

All of our efforts led to two very successful and well-attended Mock Interview events on April 23rd and May 7th, 2015.

It was a great learning and leadership experience for me. It was hard, but I enjoyed every second of it. I experienced the great feeling of following my idea and making it happen!
In a highly successful, first-of-its-kind endeavor, a multidisciplinary team of University of Wisconsin-Madison researchers has created a “tumor in a dish:” an ex vivo microenvironment that can accurately anticipate a multiple myeloma patient’s response to a drug.

The advance could mean a giant step forward in efforts to tailor medical treatment plans to individual patients.

Led by Shigeki Miyamoto, a professor of oncology at UW-Madison, and David Beebe, the John D. MacArthur Professor and Claude Bernard professor of biomedical engineering at UW-Madison, the researchers published news of the advance May 1, 2015, in the Royal Society of Chemistry journal Integrative Biology.

"We're taking the first steps toward mimicking the body in a dish," Beebe says.

Much of the research was led by Chorom Pak, who previously was a graduate student working in Miyamoto's lab.

Pak and Edmond Young (now at the University of Toronto) and the other researchers produced an assay, or testing process, which involves co-culturing multiple myeloma tumor cells with their surrounding nontumor cells, all from the same patient, in a microscale petri dish. The researchers then treated the tumor cells with bortezomib, a drug commonly used in multiple myeloma therapy. And after only three days, the researchers could determine whether the drug was effective — or not.

They compared the results of their ex vivo tests with the success or failure rates of actual patients who had received the drug — and an unprecedented 100 percent of the ex vivo test results matched the results of the patients.

Multiple myeloma is a universally fatal cancer. Rising in the blood marrow due to an accumulation of abnormal, or cancerous, plasma cells, myeloma is treatable but incurable.

"The median survival rate has improved, but is only about five to seven years," Pak says.

The new assay could save many multiple myeloma cancer patients the psychological stress of having to try multiple drugs until they find the most effective one. The assay reduces clinicians’ need for this trial-and-error approach while treating a patient, and it also lowers the cost of treatment.

The fundamental idea behind the research was to focus on everything surrounding a tumor, not just the tumor itself. These surroundings can include bone marrow stromal cells, macrophages and other immune cells, all of which represent an integral part of the tumor's environment. By including these components in a microfluidic petri dish — a device developed by Beebe and Miyamoto’s lab a few years ago — the researchers' ability to accurately gauge results increased dramatically.

Beebe says scaling down the testing environment in the group’s research is akin to moving from a lake to a bathtub: While the huge area of a standard-sized petri dish dilutes all the extra cells, the microscale petri dish the team used allows cancer cells to continue interacting with their usual surroundings, but outside of the body.

The researchers essentially created a miniaturized external model of an individual’s cancer, says Pak.

She has founded a service-based company called Lynx Biosciences based on these findings, and the company was recently a finalist in the 2015 Wisconsin Governor's Business Plan Contest. Pak and fellow researchers are looking to conduct a prospective trial, which, instead of simply matching the results of patients with that of the ex vivo tests, will actually use the ex vivo tests to identify responsive and nonresponsive patients. In addition, they are starting to consider what this discovery means for other cancer types and other drugs.

The researchers’ results could have interesting and wide-ranging implications for the future of cancer treatment and therapy, although their work is far from over.

"This is only one type of cancer, one particular drug, and we’re a long way from implementing this and helping patients in a widespread way," Beebe says. "But it’s happening. This is an exciting time in this area, and we’re definitely going to see more of this."

Funding for the research came from the National Cancer Institute of the National Institutes of Health and a collaborative grant funded by the Trillium Fund of the UW Carbone Cancer Center. Other authors on the paper include hematology Associate Professor Natalie S. Callander and Assistant Professor Fotis Asimakopoulos, biomedical engineering alumnus Edmond W.K. Young, medical physics alumnus Benjamin Titz, biostatistics and medical informatics Professor KyungMann Kim, associate researcher Sandeep Saha, and undergraduate student Kenny Chng.
Check out What's Going on at CMB!

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www.cmb.wisc.edu
CMB Student Profile: A Day in the Life of CMB Students

by: Joseph Bruckner, CMB Graduate Student

One of the great things about a PhD education and career in science is that so often we apply ourselves in diverse and consistently plastic ways - in a single day a PhD student might be required to perform wet lab experiments, write, critique published literature, present their work, and teach or mentor younger students. Furthermore, one of the strengths of the CMB graduate program is the diversity of research that happens under its umbrella. To capture a general picture of what daily life is like for CMB students, I sat down with two current students and discussed their daily routines in the lab and beyond.

Gulpreet Kaur is a second year student from New Delhi, India. After completing her undergraduate education at Guru Nanak Dev University in Punjab, Gulpreet moved to Florida and completed a masters degree in Cell and Molecular Biology at the Florida Institute of Technology, where she studied bacterial replication. For her PhD, Gulpreet decided to work in eukaryotic cells and joined the lab of David Wassarman, where she uses Drosophila fruit flies to study the genetic basis of the neurodegenerative disorder Ataxia telangiectasia.

Gulpreet takes time to bike, run, and cook - especially Indian and Indochinese dishes.

Also in his second year, Kevin Cope first discovered a love of plant biology growing up on a five-acre farm in Salem, Utah. After completing his undergraduate degree in Plant Science and Biology at Utah State University, Kevin joined the lab of Jean-Michel Ané for his PhD studying the mutualistic relationship between poplar trees and the fungi that colonize their roots.

Gulpreet and Kevin begin their days in a similar manner with either a short walk or bike ride to campus. Even the cold Wisconsin winters don’t deter Kevin from his daily bike commute - studied bike tires make the journey possible on all but the most extreme days. After arriving, the day begins with a mixture of reading, writing, and planning the day’s experiments. Prelim preparations are best accomplished with a fresh morning mind, so Gulpreet devotes the bulk of the morning catching up on recent literature relating to her project and topics of interest. Ataxia telangiectasia (A-T for short) is a rare inherited disorder characterized by severe immunodeficiency and progressive neurodegeneration, so Gulpreet searches the literature for background information to inform her hypotheses on the role of DNA damage, oxidative stress, infection, tissue damage, and the associated immune response in A-T pathology.

Beyond his family Kevin is passionately involved in volunteering with a local Boy Scout troop, where he serves as Scoutmaster.

On a typical day, Kevin might devote half an hour in the morning to meeting and setting out goals with the four undergraduates he supervises, as well as his own experimental planning for the day. His prelim also looming, Kevin spends the rest of the morning reading relevant research and drafting sections of his prelim proposal. Poplar is still an emerging model organism and Kevin is the only one working with it in the Ané lab, so he and his undergraduate team invest significant effort in developing the methods for culturing Poplar in a lab environment and testing their interaction with fungi.

To test his hypotheses about the factors that may mediate the association of fungi with poplar roots, Kevin employs transient gene knockdown and is considering developing CRISPR/Cas9 to engineer his desired changes in the poplar genome.
In the afternoon at the Wassarman lab in the Genetics and Biotechnology Center, Gulpreet examines the role of an activated immune response in A-T-associated neurodegeneration by extracting and culturing hemolymph from adult flies to assess bacterial load. Gulpreet has observed an activated immune response in glia in her fly A-T model. Glial cell types are tightly associated with neurons to provide functional, structural, and nutritional support and often implicated in neurodegeneration, so in what way might bacterial load affect glia in the brain? Gulpreet and her lab hypothesize that A-T may involve increased intestinal permeability, so to address this hypothesis Gulpreet prepares and feeds her flies special food laced with blue dye. After several hours she simply counts the number of flies whose entire bodies have become blue, or "Smurfed." A given afternoon might allow for a lot of Drosophila genetics, some hemolymph extraction, a Smurfing assay, and on a particularly busy day even an experiment or two assessing fly behavior.

A few blocks away at the Ané lab in Microbial Sciences, Kevin starts his afternoon with an RNA sequencing experiment to determine the fungal factors that affect plant root growth. A single replicate for RNA sequencing might take a full week, so on a given day Kevin might be rooting poplar cuttings, treating them with fungal signals, or freezing and grinding roots for RNA extraction. To validate his results from RNA sequencing and verify genes differentially regulated in plant-fungal symbiosis, Kevin also sets up quantitative reverse transcriptase PCR reactions. To optimize his workflow and assess many candidates, Kevin spends significant time training his undergraduate team for each assay.

Kevin and Gulpreet both finish their lab work at similar times in the early evening. Gulpreet takes time to bike, run, and cook - especially Indian and Indochinese dishes. Since moving to Madison Gulpreet has devoted much of her free time to the Indian Graduate Students Association, where she was vice president last year. Through this group she has hosted international students and engaged in large cultural events open to the entire campus, especially the Diwali festival each fall. To “help keep him grounded,” Kevin enjoys spending much of his free time around the house with his wife and one-year-old son. Beyond his family Kevin is passionately involved in volunteering and on a particularly busy day even an experiment or two assessing fly behavior.

For more information on the Wassarman and Ané labs, see their faculty trainer profiles at www.cmb.wisc.edu


Kevin Cope, Class of 2013, Lab of Jean-Michel Ané
NSF Graduate Research Fellowship Awardee

Asuka Eguchi, Class of 2010, Lab of Aseem Ansari
Stem Cell and Regenerative Medicine Center (SCRMC) Training Award

Michelle Keller-Pearson, Class of 2015, Labs of Erin Silva & Jean-Michel Ané
NSF Graduate Research Fellowship Awardee

Angela Myers, Class of 2013, Lab of Richard Gourse
NSF Graduate Research Fellowship Awardee

Kelli Pointer, Class of 2012, Lab of John Kuo
Preuss Award, Abstract will be presented at the upcoming meeting of the Congress of Neurological Surgeons

Erica Schwotzer, Class of 2014, Lab of Arash Bashirullah
NSF Graduate Research Fellowship Awardee

Sarah Wilson, Class of 2014, Lab of Laura Knoll
DoD NDSEG fellowship

Alan Attie
Elected as Fellow of AAAS

Pam Kreeger
Received the NIH new innovator award

John Kuo
Elected to the Society of University Surgeons (SUS)
Appointed to the SUS Basic Science Committee. Tumor Section Editor of “World Neurosurgery” Editorial Board of “Neurosurgery”.

Wan-Ju Li
Emerging Investigator Award by the Stem Cell Research & Therapy journal.
How does a single hormone influence multiple processes during biological development? What new nuggets of knowledge could we glean if we took a holistic, systems-wide approach to microbiology?

These were the respective ambitious questions Rob Ihry and Saheed Imam – both newly minted PhDs from the Cellular & Molecular Biology program at UW-Madison – had set out to answer through their graduate research.

Ihry and Imam have both won the inaugural CMB Exceptional Thesis Award. This annual award honors CMB graduate students who have written and defended outstanding theses. As part of the award, Ihry and Imam will each receive $250 and a plaque, and their names will be added to a plaque that will housed in Bock Laboratories, the home of the CMB program on campus.

“Anyone who receives a PhD has already accomplished a significant amount,” says David Wassarman, Chair of the CMB graduate program. “We want to highlight some of the exceptional research being conducted in the CMB graduate program, and I think we have two truly excellent award winners this year in Rob and Saheed.”

Ihry was a graduate student with Arash Bashirullah, Associate Professor in the Department of Pharmacy. His research focused on understanding how steroid hormones affect a wide variety of developmental processes with exquisite tissue and temporal specificity in the fruit fly. Ihry had to master a wide spectrum of techniques in graduate school and is grateful for the support and help he received from his colleagues and Bashirullah. “They all were critically involved with my projects and nothing would have taken off without them by my side,” he says.

Now working as a Post Doctoral Scholar at the Novartis Institute of Biomedical Research in Cambridge, MA, Ihry was delighted to win the Exceptional Thesis Award. “My whole life I have only been nominated for these [awards],” he says, “and to be recognized by such a well-ranked program and university is incredible.”

Imam’s graduate research, in the laboratory of Timothy Donohue, Professor in the Department of Bacteriology, involved creating and modeling a systems-level map of various metabolic and transcriptional processes in the bacterium Rhodobacter sphaeroides. His graduate research involved bringing together laboratory and computational expertise, and Imam thrived pursuing this interdisciplinary project. “I was given the freedom by Tim to chart my own course and develop my research,” says Imam, “and I got to work with some great scientists in my lab and across the campus.”

Imam is now a Post Doctoral Fellow at the Institute for Systems Biology in Seattle, WA and sees winning the Exceptional Thesis award as icing on the cake of a great graduate school experience. “There are a lot of talented graduate students in our program doing great research,” says Imam, “so to be singled out for an award really means a lot to me.”

Although Ihry and Imam pursued different scientific research, Wassarman was impressed by their ability to take ownership of their respective projects. “Both of them had tremendous work ethic and were dedicated to their research,” says Wassarman, “and they were true leaders in their research projects and drove both their research and the research of other people in their labs forward.”

Graduate students play a pivotal role in driving research forward at UW-Madison, and Wassarman hopes the CMB Exceptional Thesis Award can allow the program to highlight one or two cases of outstanding graduate research. “I really want the community to see the great science that is being done here and what our graduate students can accomplish in their chosen fields,” he says.
As one of the largest biological science graduate programs at UW-Madison, CMB has been committed to excellence in graduate education since the 1960's. If you would like to make a gift to this long standing effort, visit the CMB website. Your generous support is greatly appreciated!

www.cmb.wisc.edu

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We are currently in the process of updating our Alumni Database. We would greatly appreciate it if you would fill out the survey that can be found at the QR code below, or this link:

https://uwmadison.co1.qualtrics.com/SE/?SID=SV_9FgnscAaONCnAQB

We would like to know of any updates in your personal and professional life for use in the next issue of The CMB Transcript. Be sure to keep us informed of address changes so that we can continue to send you a copy of the newsletter each season.

Would you like to speak about your career to current graduate students in the CMB Program and the biological sciences at UW? We are especially in need of alumni who work in areas other than tenure track faculty at large research institutions. Let us know if you’d like to be contacted about speaking to graduate students about your career. You can contact CMB at:

cmb@bocklabs.wisc.edu
This year, a UW-Madison group called Project Freshman 15,000 set out to break the world record for largest Rice Krispie Treat. The end product weighed in at 11,327 pounds. Crushing the previous Guinness World Record of 10,314 pounds. Luckily, they didn’t let this masterpiece go uneaten. After careful consideration, the CMB Office Staff decided that this moment in history couldn’t go unseen, or untasted. I emailed the group’s facebook page to find out if we were too late, but luckily there was still enough to go around. For only $3 a pound (or less if you buy in bulk), you could walk away with a nice brick of Krispies. The money benefitted Wisconsin charities, Camp Kesem, a camp that helps children who have been diagnosed with cancer as well as United Way of Dane County.

For more information on this group check out their website at: pf15000.com
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