The seventh annual MSTP retreat took place on August 10th at the Inn at Henderson’s Wharf in the heart of Fells Point. The MSTP retreat is certainly a widely anticipated event each year, and this year’s retreat was a success as always. The retreat’s purpose is three-fold: it is an opportunity for students longitudinally across the program to interact and share wisdom, a chance to hear distinguished physician-scientist speakers discuss their careers, and a chance to review the state of the MSTP as a whole.

The morning session began with the directors introducing the seven new members of the MSTP (in reverse alphabetical order, as usual). They acknowledged some of the accolades of this incoming MS1 class, another large and impressive group. They also described certain changes to the program, including counting the M2M journal club as an official medical school class for the MS1s and MS2s. The keynote speaker was Dr. Graeme Woodworth, associate professor of neurosurgery at the University of Maryland. Dr. Woodworth gave an expertly-crafted talk weaving together his history as a neurosurgeon-scientist with his current research interests in targeted drug delivery for glioblastoma. A consistent theme from Dr. Woodworth’s presentation was the importance of creating a unique niche for one’s career, and finding an expert team to help pursue that research. Following Dr. Woodworth, two alumni speakers gave addresses. Dr. Paul Lee, a 2006 graduate of the MSTP, gave an engaging look (continued on page 3).

The difference becomes evident as soon as I arrive on the UMBC campus. There are no loud sirens, no busy traffic, and no fast-paced city life. Instead, I hear the sounds of birds chirping, and I’m surrounded by greenery. Walking on the campus and seeing the bake sales and student clubs is reminiscent of being in undergrad. The Summers laboratory is one of the largest on campus, taking up a whole wing of the first floor, which includes multiple wet lab rooms and office space. Currently, two post-doctoral researchers, six graduate students, and three staff employees are included in the laboratory personnel. (continued on page 7)
Ah, summer is such a lovely season. We can all enjoy spending more time outdoors. Many of us have milestones to celebrate, like completing the first year of medical school (or second or third), completing graduate course work and passing qualifying exams, or even successfully defending a doctoral thesis. On the Program Leadership side, we can breathe a sigh of relief at a very successful recruiting season and implementation of several new initiatives.

Our biggest source of pride for the past year is certainly the renewal of the MSTP T32 award. While we have not yet received the Notice of Grant Award, the status of the grant on NIH Commons now reads “awarded!” I love the way that sounds. Furthermore, our request for a doubling of grant-supported stipends from four to eight has been approved. Clearly, the Students Council, our external review committee, we’ve discussed and debated every proposal, but in the end, we have a new policy that will greatly improve the MSTP experience.

In accord with the study section review of the grant and with comments from our external review committee, we’ve implemented several initiatives this year. For example, due to a terrific effort from the Student Council, we now have an annual program evaluation. Thanks to all who have completed your surveys. Those of you who have completed at least one will receive a special thanks.

Lastly, following the advice of our external review committee, we invited PhD students from the PhD Program for Clinicians to engage with our program. Look for them at the retreat and in future discussions. We are grateful for your insight and your willingness to share your experiences.

In addition to the initiatives precipitated by the MSTP grant renewal, we have officially updated the Clinical Longitudinal Elective and have negotiated a new MSTP Molecules to Medicine track that will allow our incoming students to forgo more than half of Foundations of Research and Critical Thinking.

The Dual Decree
Volume VI
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DIRECTOR’S DECREE

Michael Donnenberg, MD
MSTP Director

The MSTP welcomed twelve new students and one internal applicant to our program for the 2014-2015 school year. (Copyright Elizabeth Krassowska, III)

Kris Kriste Brao: The Eli Entomologist

Kriste is the author log of the 12-person relay that is the MSTP incoming class of 2014-15. Although she was born in nearby Washington, DC, she grew up in Hamilton, MA before attending Yale for undergrad (an Eli is a Yale alum - I had to look it up too). While at Yale, Kriste studied Biological Science, but her education centered around ecology and evolutionary biology. Her lifelong interests in nature and insects helped focus her studies on these topics. She first found her interest in nature studies when she read an autobiography of Jane Goodall as an elementary student. Naturally, Kriste’s interest in insects has led her toward the fields of infectious diseases, especially those transmitted through insect vectors. She is very excited about the opportunity to work with the University of Maryland Center for Vaccine Development and the Institute of Human Virology. She is looking forward to making discoveries in medicine, infectious disease, and insects in Baltimore. Kriste’s interest in insects is definitely her most unique hobby. She even has a “best bug” discovery: an adult ant that she found in Florida. Google Image search for “antion” on your own risk). Besides insects, she also enjoys reading, running, and watching football. We are thrilled to have Kriste as a part of the Maryland MSTP and we are expecting great things from her; after all, the anchor leg of any relay is usually one of the fastest on the team!

RETRAET (continued from page 1)

into his position as a pediatric radiologist at the NIH. While Dr. Neri Cohen, a 1989 MSTP graduate, emphasized the importance of always staying open to new opportunities as he described his varied journey through academia and industry leading to a post as a clinician-scientist at a prominent hospital.

Following lunch, GS2 students Jeff Feinberg and Jesse Stokum presented their current research on antibiotic-resistant biofilms and neuromuscular cedema, respectively. Dr. Neda Frayha also gave a brief talk about her role as a liaison between the MSTP and the Office of Student Affairs in the School of Medicine. Students split up by cohort to attend several interactive breakout sessions. These sessions covered the full range of the MD PhD experience, from an introduction to MS1 stipends from four to eight has been approved. Clearly, the Students Council, our external review committee, we’ve discussed and debated every proposal, but in the end, we have a new policy that will greatly improve the MSTP experience. Our biggest source of pride for the past year is certainly the renewal of the MSTP T32 award. While we have not yet received the Notice of Grant Award, the status of the grant on NIH Commons now reads “awarded!” I love the way that sounds. Furthermore, our request for a doubling of grant-supported stipends from four to eight has been approved. Clearly, the Students Council, our external review committee, we’ve discussed and debated every proposal, but in the end, we have a new policy that will greatly improve the MSTP experience. Our biggest source of pride for the past year is certainly the renewal of the MSTP T32 award. While we have not yet received the Notice of Grant Award, the status of the grant on NIH Commons now reads “awarded!” I love the way that sounds. Furthermore, our request for a doubling of grant-supported stipends from four to eight has been approved. Clearly, the Students Council, our external review committee, we’ve discussed and debated every proposal, but in the end, we have a new policy that will greatly improve the MSTP experience. Our biggest source of pride for the past year is certainly the renewal of the MSTP T32 award. While we have not yet received the Notice of Grant Award, the status of the grant on NIH Commons now reads “awarded!” I love the way that sounds. Furthermore, our request for a doubling of grant-supported stipends from four to eight has been approved. Clearly, the Students Council, our external review committee, we’ve discussed and debated every proposal, but in the end, we have a new policy that will greatly improve the MSTP experience.
Taking to the Sea:  
**MSTP Student Life on a Boat**

**Anthony Cole, MS II**  
**Michael Lee, MS II**

Why did we decide to live on a boat? This is a great question. As students of the MSTP program, we think of ourselves as logical beings. We do things as scientists would in calculated, careful manners supported by facts and data. So as crazy as the idea sounds, let us try to lay out all of the information we used to trick ourselves into believing this logically makes sense: we will own our own home (kind of) so we don’t have to pay rent (for the most part), it is much cheaper than buying a house (as long as nothing goes horribly wrong), and we will learn a lot (actually entirely true). And what better way to experience a harbor city such as Baltimore than from a waterfront property? Seeing as we currently have no real voices of reason in our lives (we’re looking at you, married people), we went for it.

Living on a boat is affordable, extremely manageable, and fun. Yachts are certainly a luxury, and by no means cheap toys. But if you consider the price tags in the framework of housing options, owning a yacht is affordable, and not so different than living on land. We run our boat on metered shore power as well as a freshwater line from the shore. We get our waste tank pumped out once a month for a fee, and pay a yearly “slip fee” to keep our boat in the slip as well as live onboard it. The slip fee is proportional to the length of the boat and comes with many amenities such as free membership to several gyms and pools around Baltimore, the ability to dock at any other BMC marina for a short time at no charge, membership to the Tiki Barge pool, and cable. And if you’re wondering about the affordability of a yacht the size of ours, we have calculated that with a relatively generous allowance for our month-to-month boat fees, we will have the boat paid off in about two years when compared to typical rental prices in the city. So while boats are not generally considered sound investments, financially we will come out with a “free” boat in two years when compared to otherwise losing that money to rent payments.

We could also tell you that finding a boat is pretty similar to looking for an apartment. We used a website that is called…get ready for it…www.yachtworld.com. The website lays out all the specifications for you such as number of cabins (bedrooms), number of heads (bathrooms), various galley systems (kitchen appliances), in addition to expected things like length, price, and location. One great thing about boat shopping is that you can look for homes in faraway places and then just drive it where you want it. We knew we wanted two large cabins and two heads within our price range, so we were able to sort different options, just like you would a house. We also worked with a yacht broker to help us sort through the details that our inexperience could cause us to miss. In the end, we settled on a 38-foot Sea Ray Aft Cabin motoryacht, and we could not be happier with our choice. The boat had been carefully maintained to a level nearing paranoia according to our boat friends (you could eat off the engine room floor), and it has plenty of space for the both of us to live comfortably. Because the boat was fortunately in the same marina we were planning to live in, we also had our slip fees paid through March of 2016 as part of the deal. Overall, this means that our first month of living expenses totaled $180…which we split.

As we have this conversation over and over with others, inevitably we are faced with the question “…but why?” And to be honest, the aforementioned reasoning is only a small portion of why we are doing this. The main reason is that we are both more excited than ever about the experience. Of course on the water, we are more closely tied to the weather, and there are going to be tough times. We will have to learn to winterize the boat so that all of our systems don’t break and freeze. But every tough part of this endeavor will be balanced out by awesome experiences. Waking up in the morning on the water with the sun rising, taking cruises past Fort McHenry, and meeting so many interesting people are just some of the parts of living on a boat that make it all worth it. As we lie at the Tiki Barge pool sipping cocktails, we can’t help but laugh at the fact that we are saving money. Surely we must have discovered some type of loophole in the real estate game. Or maybe we really are as crazy as people think. We certainly spend a fair amount of time laughing at the simplicity of it all. But we can’t help but be excited for the experience and the learning we are sure to do as summer turns into fall, because, as we all know, winter is coming.©
SUMMARY OF GRADUATE PROGRAM REQUIREMENTS FOR MSTP STUDENTS

Program & Directors | Course Requirements (Credits) | Qualifying Exam Format | Thesis Proposal Requirements | Thesis Defense Requirements | Current Students
---|---|---|---|---|---
**BIOCHEMISTRY AND MOLECULAR BIOLOGY** (Joint Program between UMB and UMBC)
Directors: Michael Summers (UMBC), Gerald Wilson (UMB)
Coordinator: Koziom Koch
- NIH NRSA-style proposal on theoretical research project; Oral Exam regarding general biochemistry

**MOLECULAR MICROBIOLOGY AND IMMUNOLOGY**
Director: Brent Hassel
Coordinator: June Green
- Basic Immunol. (3), Microbial Path. (3), Virology (3), Electives (3), Seminar (1)
- 3 hour oral exam emphasizing the student's chosen discipline, covering basic course material and scientific thinking
- No later than 24 months after submission. Fifteen page proposal followed by oral defense
- Written dissertation followed by public dissertation defense followed by private Q/A session
- L. Layte Bradford, Sarah Boudreaux, Jeffrey Freiberg, Molly Hitzo

**NEUROSCIENCE**
Directors: Michael Shipley and Jessica Mong
Coordinator: L. Enev Cockerham
- Fundamentals of Biostatistics (3), Neuropsychology Journal Club (1), Choice of Elective (3)
- NIH-NRSA-style research proposal based on set of aims agreed to with thesis advisor
- Approximately 1 year after qualifying and 1 year before dissertation defense
- Written proposal, private oral defense followed by public oral presentation
- Written dissertation followed by private dissertation defense followed by public dissertation defense and Q/A session
- Tuok Peter Li, Anthony Park, David Kurland, Haiwen Chen, Jesse Stokum, Sarah Stockman, Elise Ma, Sai-Schin Devakurani, Natalie Hesselgrave

**BIOENGINEERING (UMBC)**
Chair: William E Bentley
Graduate Director: John P. Fischer
Director: Tracy Chung
- Rate Processes in Bio Systems (3), Transport Phenomena (3), Physiological Evaluation of Bioengineering Designs (3)
- Electives (3), Choice of Academic and Student Affairs (2), Bioengineering Seminar (1)
- Research aptitude exam (RAE); NIH-R21 style written proposal and oral presentation
- Within two years after completion of RA, and by fourth year. At least 12 months before R21 style written proposal (approx 30 pages) and proposal followed by oral presentation and formal questioning
- Within two years after proposal. Written dissertation followed by public dissertation defense and Q/A examination
- Joshua Brown

**MOLECULAR MEDICINE**
Director: Tom Antalick
Coordinator: Marinka Garber
Track Leaders: Jeff Wrimalt, Wen Chen, Rosinsky (Genome Biology), and Teraz Kuwatsuka (Physiology and Pharmacology)
- Molecular Medicines Survival Skills (2), Electives (4), Seminar (2), Dived With McNaron (Research), Elective Research (12), and track specific course
- NIH-NRSA-style proposal followed by oral exam regarding the proposal
- Within 18 months of starting, and at least 12 months later. Written dissertation, before dissertation defense followed by R21 style written proposal followed by public oral defense
- Written dissertation followed by public dissertation defense followed by private Q/A session
- Cancer Biology: Knoel Chakrabarti, Alex Tsai, Haley Simpson, Carolyn Rosinsky, and Nathan Roberts
- Molecular Medicine and Pharmacology: Andrew Weinberg
- Genomics Biology: Jeff Kleinerberg

**EPIDEMIOLOGY AND HUMAN GENETICS**
Director: Laura Hungerford
Coordinator: Jessica Kelly
Track Leaders: Mona Baumgardner, Tzu-Fang Lin, and O. Colin Stock (Molecular Epi), and Toni Collin (Human Genetics and Genome Medicine)
- 3 part 3 day written exam (both closed and open book sessions) and must analyze a data set within 48 hrs. Submission of a NIH-NRSA general research plan describing the research planned for dissertation
- Within 6 months of obtaining candidacy. Written dissertation followed by public examination followed by closed Q/A session
- Written dissertation followed by public dissertation defense followed by private Q/A session
- Cancer Genetics and Human Genomics: Christie Perry

**TOXICOLOGY**
Director: Kathryn Squibb
Coordinator: Linda Horne
- Pharmacology (2 or 3 semesters), General Pathology (3), Statistics (3), Seminar (3), Methods in Toxicology (2), General Electives (5 or 6) and track specific courses
- Write abstract for three non thesis projects; Abstract with most committee votes will be selected for a full length proposal, followed by oral exam regarding this proposal
- Submit written proposal followed by oral presentation followed by Q/A session
- Written dissertation followed by public dissertation defense and private Q/A session
- -

Dr. Summers’s mentoring style is much more hands-off in comparison to how most PI-led mentorship laboratories are structured. Most of his time is spent writing grant proposals and reviewing papers with minimal time in the wet lab. Dr. Summers and I usually have a meeting every few days, when I update him about the project and we plan the next steps. He makes recommendations, and the rest is up to me. I decide what to do with the tasks he assigns me to complete. This independence is one of my favorite aspects of the lab. Despite Dr. Summers's busy schedule, he has an open door policy for his students to have a meeting or any general conversation. This balance of independence and supervision allows me to direct my own project while still receiving the needed guidance. The Summers lab is also heavily involved with the Maryland Institute for Bioengineering. This funding complements the independence and has given me the ability to pursue multiple avenues for my project. Research aside, Dr. Summers is enjoyable to be around. His age is definitely misleading when it comes to physical activity. The lab outings consist of weekly two-hour mountain biking rides, periodic hikes, and the yearly lab ski trip to Maine.

Another major novel aspect of this laboratory's structure is the heavy presence of undergraduate and high school students. Some of these students are UMBC undergrads, others are UM club members, and then the summer's other students arrive from institutions across the nation. This summer, a total of forty undergraduate and three high school students were gaining laboratory experience here. Despite the large lab space, there are times when I can hardly walk through the wet lab and must weave through a sea of undergraduates all gathered around one gel. At first glance, the lab may seem simply too crowded and unorganized, but it is actually well-structured. The high school and undergraduate students are divided among the graduate students and post-doctoral researchers. My group consists of a total of six students, ranging from recent high school graduates to a PhD student. Together we are working to characterize and solve the solution structure of the 5’-untranslated region of the HIV-1 RNA genome. I am very fortunate to have a highly efficient and reliable team. Most of the wet lab experiments can be completed without my supervision, allowing me to focus on other aspects of my research. Allowing undergraduates to work in the laboratory has many benefits for both sides: they obtain valuable research experience and the graduate students gain the extra help. Personally, I feel the greatest satisfaction is the unique mentoring experience. For most of the undergraduates that join the lab, it is their first research experience. I have a key role in shaping their first “hands on” experience in science. I have made a considerable effort to ensure that my students are not only conducting experiments but, more importantly, that they understand the questions that we are trying to solve. Students are encouraged to think toward an MD or PhD, but a majority of them are aiming for MD/PhD programs. As the only MD/PhD student on the campus, I have a unique position, helping and advising the students from my experience. The lab is focused on basic science structural work, so to help bring the gap to clinical applications, I require my students to learn about related diseases and antiretroviral target classes. My group’s enthusiasm has gone above and beyond my initial expectations by knowing the related CD4+ count for each disease and drug mechanisms and side effects.

The combination of the well-structured lab, motivated undergrad help, self-directed projects, and compelling mentorship has created an amazing environment for me to do my PhD work. With the help of my competent and amusing under-grad team, I can leave for a conference without my project losing a single day’s worth of lab work. With Dr. Summers’s guidance, I have a large role in the direction of my project. Despite being on a separate campus from my classmates and program, the great atmosphere has made it easy to call this lab and campus home.
CONGRATS!

DOCTORAL DISSERTATIONS

**Mark Kvarta**  
*Neuroscience*  
“Synaptic Blues: Corticosteroids and AMPA Receptor Function in Depression and Antidepressant Action”  
Mentor: Scott Thompson

**Kyle Wilson**  
*Molecular Microbiology & Immunology*  
“NK1.1+B220+ Cell Depletion Enhances the Rejection of Established Melanoma by TAA-Specific CD4+ T Cells”  
Mentor: Paul Antony

**Adam Fisch**  
*Molecular Medicine*  
“The Pharmacogenomics of Clopidogrel and Aspirin”  
Mentor: Alan Shuldiner

**Grace Maldarelli**  
*Molecular Microbiology & Immunology*  
“Function of PilJ in the Clostridium difficile type IV pilus” from  
Mentor: Michael Donnenberg

CONFERENCES

**Alex Tsai** received a Trainee Poster Award for his presentation of “Identification and characterization of novel immunosensitizing therapeutics for melanoma” at American Association of Immunologists (AAI) Annual Meeting in New Orleans, LA from May 8-12.

**Haiwen Chen** received a Best Talk Award for her presentation of “Distinct Organization of Evoked and Spontaneous Vesicle Fusion Sites” and **Tuo Peter Li** presented “Postsynaptic crowding can impede the escape of membrane proteins” at the Gordon Research Seminar and Conference Excitatory Synapses and Brain Function at Salve Regina University in Newport, RI from June 6-12.

**Sarah Boudova, Kristi Chakrabarti and Christy Perry** attended the National Student MD/PhD Conference in Keystone, CO from July 17-19.

PERSONALS

**Nicolas Dorsey** had a baby!  
William Remington Dorsey, May 13, 2015

**Natalie Hasselgrave** had a second baby!  
Evyn Mae Cecile, June 16, 2015

**Jeffrey Kleinberger, GS III & Laura Gomez-Martin** married on May 16, 2015 in Pittsburgh, PA.

**Tuo Peter Li, GS V & Bingqing Ye** married on May 22, 2015 in Changde, China.