This winter has marked the launch of a series of career workshops organized by CMB’s new career committee (CMB and PIBs students Albert Chen, Corey Cunningham, Chetna Gopinath, Sara Wong and Macy Zhang, joined by CMB faculty advisor Aaron Goldstrohm). The committee has taken an innovative approach to identifying and researching possible career paths, then inviting panelists both from the University and from the outside, including CMB alumni, to take part in interactive discussions of their career choices and experiences. The committee has collaborated with faculty and the retreat committee to integrate this approach into our weekly seminars and the retreat. Thus far, workshops have focused on careers in academic science, biotech, pharma and tech transfer, teaching at liberal arts colleges, and medical and science writing. Upcoming is a workshop at CMB 850 on active career exploration and a panel at the spring retreat, organized by the retreat committee (CMB students Jennifer Chase, Nicole Gabreski, Nadia Sebastian and Corinne Weisheit and CMB faculty Stephanie Bielas and Sonny Wong) that will feature participants who will discuss non-profit research foundations, research opportunities in government laboratories and combining teaching and research at small colleges.

Career planning is of growing interest in biomedical sciences. This reflects both a positive development, the recognition of diverse career paths open to individuals with advanced scientific training, and one that is perhaps less positive, concerns about public support for research and the availability of positions in academia and industry. Several relevant points of view are represented in articles in this newsletter. As Director of CMB, I can say that the goal of our and similar programs remains training students to become insightful, independent and original researchers. The kind of critical thinking skills one develops in a Ph.D. program like ours can be applied in many ways, but these skills are particularly well-suited to a research career. I encourage all of our students to consider their career options carefully, and to keep in mind that a career in research, whether in an academic or industrial context, can be both attainable and satisfying.

I would like to close by thanking Cathy Mitchell, our irreplaceable CMB Administrator, for everything she has done for this program. She has been the glue that holds us together, and especially so in the transition from Jessica’s leadership. I owe her a tremendous personal thanks for the help she has given me over the past two years. We all wish her and her husband a fun and rewarding retirement. Finally, I would like to welcome to CMB James Musgrave, III, hired as our Assistant Administrator, but who also provides support to the Immunology and Cancer Biology programs. Jim has training both in science and academic administration, and we are already benefiting from his energy and expertise.

See you at the retreat!
Increasing NIH Funding Won’t Improve Research Climate

by Dr. Margit Burmeister

The 2013 government shutdown and sequester has many academics advocating for NIH funding increases in the future. However, Dr. Margit Burmeister is not one of those academics. Last semester, Burmeister made waves when she emailed her fellow CMB faculty and students her reasoning for not supporting an increase in NIH funding. Below, she expands on her controversial position.

Every few months, especially since the recent sequestration and government shutdown, I get calls from professional science organizations to lobby our members of congress and senators for more funding for the NIH. Is increasing NIH funding the best way to improve science in the U.S.? I don’t think so.

When I was hired at the University of Michigan in 1991, I immediately wrote an NIH grant, and in 1992 was turned down though the grant was in the 14.4th percentile with largely positive comments.

Sound familiar? So, what has changed since 1991? Why are we back to single digit NIH funding lines and cries for more money?

What actually happened to NIH funding?

Between 1998 and 2004, the NIH budget more than doubled nominally. Even if you adjust for inflation and consider the last year of cuts, we still have nearly 50 percent more funding. So, where did this money go, and why are we not better off?

Universities went into a building boom. The University of Michigan expanded research space dramatically with buildings like LSI, BSRB, NCRC. The same happened at universities all over the country. Lush NIH funding freed up money, but instead of spending it on students or research, it funded a building boom.

“...The current funding squeeze signals a needed change in the academic environment...”

Universities went on a hiring spree. The newly expanded research facilities needed to be filled and from 1990 to 2005, the number of faculty in U.S. medical schools doubled. Many were hired as soft money positions, without a long-term commitment.

The biomedical workforce aged. Mandatory retirement was lifted in 1994, resulting in both longer careers and immigration of faculty from foreign countries with mandatory retirement. In 1980, less than 1 percent of principal investigators (PIs) were over age 65, but now account for nearly 7 percent of the total. In parallel, in 1980, close to 18 percent of all PIs were age 36 and under. That number has fallen to about 3 percent in recent years.

Universities pushed more of the cost of faculty and research to the NIH. When I was hired in 1991, my offer letter stated that within 3 years, I would have to bring in 18 percent of my salary from grants. Now, basic scientists have to bring in 50 percent of their salary from grants, and often more is demanded. It’s not uncommon to be asked to bring in 80 percent or more of your salary from grants. At the same time, other government support, such as state funding, decreased, and less clinical revenue is available to fund research.

What about the future?

Many postdocs are now waiting in the wings for faculty positions, and more money from NIH will only repeat history. More faculty positions would be filled, and the funding limit will remain at an extremely low level. Maybe that is a good thing, as more people will find employment in this industry, but it is not sustainable. The 90 percent or more failure rate for grants is also not good for science morale.

As a grant reviewer for many other countries, I am not aware of any other country charging faculty salary to grants, except for time-limited junior positions. Rather, faculty are hired by universities primarily as professors, and their salary is funded by the universities, which often, in turn, are funded by their governments.

In 2010, Francis Collins and Bruce Alberts stated that the NIH should reduce faculty pay by 50 percent. This would be a good compromise for our funding problem (several CMB faculty emailed me saying they wished even more!), but it needs to be done slowly, and stepwise. The University of Michigan Medical School has taken the first step by paying departments 50 percent of instructional track faculty salary.

The current funding squeeze signals a needed change in the academic environment and should be seen as an incentive for the NIH to cap the highest salaries, limit indirect costs to 50 percent, and reduce the amount of faculty salary allowable on grants.

Dr. Margit Burmeister
Research Professor, MBNI; Professor, Dept. of Psychiatry; Professor, Dept. of Human Genetics
Co-director, Bioinformatics Program
Fourth year Ph.D. candidate, Esha Mathew, is a convert to biological research. Mathew holds both Master’s and Bachelor’s degrees in engineering but grew to love the bench after a stint at Children’s Hospital in Boston. Now she spends her time studying hedgehog signaling in pancreatic cancer with Dr. Pasca di Magliano.

**What motivated you to pursue the Science and Technology Public Policy (STPP) certificate program?**

I actually had taken a few of the required classes before officially applying for the certificate. It’s a remarkably flexible program in that I can take classes prior to applying for it, and if I decide not to complete it, that seems to be allowed as well. I’ve always had an interest in policy, particularly the growing intersection of science and technology with public policy.

**What has been your favorite class of STPP?**

I would recommend them all, but Introduction to Science and Technology Policy Analysis (PubPol 650) is incredibly interesting. I’ve never had to think about many of the topics we’ve discussed, such as who should pay for research and why, whether more and better science is necessary for policy making, or even thinking about who judges the value of research programs. I wouldn’t say that my overarching opinions on these topics have changed, but I’ve never critically discussed them, especially not with people from non-science backgrounds. Hearing their perspective on these issues has been eye opening. I really feel all CMB students would benefit from a truncated version of this class.

**What has been the most exciting experiment you have done while in Marina’s lab?**

The chick chorioallantoic membrane assay was pretty cool to learn. Basically, underneath the eggshell is a thin membrane, which we can lower, while being careful not to puncture it. That done, the eggshell can be cut open, and tumor cells (with or without fibroblasts, for my particular experiments) can be dropped on top of that lowered membrane. It’s a really neat assay, since we can track both tumor growth and vascular changes over time, without confounding factors such as immune cells. It also makes quite a striking image (see the bioart section).

**What is your favorite part of graduate school at Michigan?**

Michigan is an incredibly vibrant campus, and there are always cool shows, games, and lectures to go to. Also, there’s a huge population of students who are really passionate about their particular area of study. I really like chatting with my friends who are in completely different fields about the work they do.

**What has been your favorite class of STPP?**

I really feel all CMB students would benefit from a truncated version of this class.

“Arts and sciences are branches of the same tree. All these aspirations are directed toward ennobling man’s life, lifting it from the sphere of mere physical existence and leading the individual towards freedom.”

—Albert Einstein
Tell us about your time before you came to the University of Michigan.

I did both my PhD (Neurobiology) and postdoc at UCSD in Joe Gleeson’s lab. I don’t generally recommend staying in the same lab for a postdoc, but it was a unique situation that worked out for me. During graduate school I got married and had my first child. It was going to be difficult to move my whole family to a new location. I was able to switch my focus in the same lab and still get a wide variety of experiences. My graduate work was centered around a mouse model, but during my postdoc I was able to pursue molecular genetics and the pathogenesis of human disease. My current research is the genetic basis of brain malformations and intellectual disability.

You took some time “off” before graduate school. Tell us more about that.

Haha, yeah. I was interested in new experiences. I was still not sure what I wanted to do at that point. I loved science, but I also loved English Literature. My undergraduate degrees are in both subjects. I took some time to teach Biology and English at an all girl boarding school in Norway. My path to graduate school wasn’t a clear one, but I love science and was never afraid of hard work. I decided I liked the nitty gritty of experiments and followed that path. I’m still glad I explored English Literature and realized my other talents.

How did you get interested in your topic of research?

I always really liked neurobiology. After I came back from Norway, I worked on neurodevelopment in the spinal cord in zebrafish and *Xenopus laevis*. I also took classes, did tons of rotations in labs that were in other fields. I liked a lot of things and took the time to explore them. I found out I really enjoyed the combination of human genetics and neurodevelopment. The puzzle of neuroanatomy and function is really interesting to me. I thought it was fun and so I tried it.

What kind of training goals do you like to set for graduate students?

I want my students to have a firm foundation in the field, which is important when conveying ideas. I also want them to have rewarding experiences and I try to foster creativity. It’s important to me that they be able to interpret results, set goals, write well,

It’s short-sighted to train every PhD candidate with the goal of keeping them in academics. We need highly educated people in all areas.

mistakes. It’s essential to effective troubleshooting. There are technical experts in my lab to help with techniques when it’s needed, so the burden isn’t so heavy on a student. It’s important to have a good lab dynamic and my lab members are all great with each other. I do love interpreting results and planning experiments with my students though.

Has being a woman in science presented any unique opportunities or challenges?

You can’t deny the biology of pregnancy and birth. It all comes with complications, especially if you want to be very attentive to your family. I compensated by surviving on very little sleep. Being a woman in science usually means you have to meet the needs of a lot of different people at the same time. Even if you are at a university that is accepting of you having a family, this is a career that consumes you. To do the job well, it takes a lot of time. So does being a mother.

Do you have any advice for students who want to pursue a similar career path?

You have to love it. If you don’t really feel it in your soul, you won’t survive the tediousness and rejection. You also need thick skin, confidence, and good ideas worth investing in. There are too many other fun careers out there to beat yourself up over this one. Happiness is success.
Breaking-up is Hard to Do: CMB is Here to Help

by Brooke Horton

A bad lab environment can derail your career, mental health, and graduate education. Despite being a serious issue that a significant number of students face during grad school, no program at the University of Michigan currently has a standard procedure for changing mentors. CMB will be the first program to adopt a policy recognizing that changing thesis advisors is acceptable and will have formal procedure for doing so.

I decided to leave my thesis lab in my third year of training. It isn’t a decision for the faint of heart. All my work was gone, rotations weren’t an option, my funding was pulled, and I felt hopeless. Graduate school had been a part of my career plan since sophomore year of high school, but now I was seriously considering quitting. I felt alone in my failure, but I soon found out I was not alone. Many other CMB students have struggled with similar feelings and challenges as they managed the process of leaving their thesis lab.

Thankfully, the CMB administration will take a significant step this year to ensure that students receive career counseling and support while in the process of changing labs. A formal procedure for this situation has been adopted and will appear in the CMB handbook.

This policy is the result of both student activism and a genuine concern for students from the CMB administration. In a survey of students who changed thesis labs during their training with CMB, a number of issues came up consistently. These results were presented to the CMB Program Committee for response.

The impact of changing thesis mentors

Currently, CMB looks at each lab change on a case-by-case basis and does not have a systemic procedure to assist students. A multiplicity of CMB students were interviewed about their experiences while changing labs under this unguided system, their career outlook, and suggestions for improving the process.

Here’s what they agreed on.

There was a lack of communication about data transfer and authorship with their former mentor. This issue is a very practical one that was consistently over-looked. Mentors and students often have different ideas about how much work constitutes authorship and assumptions can’t be made by either side. Conversely, intellectual property is a clear cut issue and expectations for data transfer should be communicated, but no one was having that conversation. It was agreed that having these conversations as a part of a formal process would be helpful to both the mentor and the student.

A lack of community due to misconceptions about why they left their lab. They felt alone and judged. These individuals left their labs because of a lack of funds, concerns about scientific integrity, personality clashes, and sexual harassment. However, they felt that the CMB community attributed their decision to leave their lab to an inability to keep intellectual pace, a lack of dedication, or because they’re difficult to work with. Some interviewees suggested having peer mentors would be beneficial and others thought formal recognition of the normalcy of switching labs by CMB would be enough.

CMB addressed these issues and added further provisions

CMB responded by officially taking the stance that “occasionally circumstances may lead a student to contemplate leaving his/her thesis lab” and established a no-fault policy for changing mentors. CMB is now actively creating a positive environment and providing relevant resources for students changing thesis labs.

Provisions of the new policy include: formal rotations, assignment of a faculty advisor with no conflict of interest, a formal assessment of career goals, a mediated discussion of data transfer and authorship, an opportunity for peer mentoring, and encouragement to obtain letters of recommendation from relevant faculty to give potential new mentors. The policy is closed with the acknowledgement of emotional stress and a litany of mental health and confidential reporting resources.

This year CMB will become the first graduate program at the University of Michigan to have a policy and procedure directly addressing a change in thesis mentors. In doing so we will join universities like John’s Hopkins and Stanford in supporting students in their careers, not just their thesis work.
Ah spring! The birds are chirping, Game of Thrones has returned, the undergrads will soon be leaving, and walking out of lab at night is a little more bearable now that it’s consistently stayed above freezing for more than five days. Spring also means the CMB Retreat is right around the corner!

This year, the Retreat Committee has planned an exceptional lineup of events focusing on the hot-topic issues of science policy, the funding decline, and career development for young scientists. In addition to the standard oral presentations and poster session, the weekend-long retreat will feature a variety of workshops and discussions to both inform and inspire trainees and faculty alike.

Keynote to address problems in biomedical research field

This year’s keynote speaker is sure to stir up lively conversation and opinions. Henry Bourne, MD, started his career as a newspaper reporter, and went on to train as a physician and then a cell biologist. During his successful research career, Dr. Bourne studied trimeric G proteins and their receptors, as well as the cell signaling pathways of polarity and chemotaxis in human leukocytes. Bourne is now an Emeritus Professor at University of California, San Francisco and avid science communicator. His passion for communicating the struggles of today’s research climate and his suggestions for reform make him a perfect complement to the retreat theme.

Bourne closed his lab in 2008 and now the 5th annual CMB Retreat will be held May 16-18 at the Kellogg Biological Station on Gull Lake. This year, the Retreat Committee has planned an exceptional lineup of events focusing on the hot-topic issues of science policy, the funding decline, and career development for young scientists. In addition to the standard oral presentations and poster session, the weekend-long retreat will feature a variety of workshops and discussions to both inform and inspire trainees and faculty alike.

Looking for something interactive?

The Retreat Committee has planned a few events to get retreat-goers more engaged throughout the weekend. Of note is a debate on science policy and funding led by Dr. Bourne. This conversation will be a unique and interactive opportunity for students and faculty alike to debate the current state of affairs in biomedical research, and what can be done to reform for the future. Additionally, an alumni career workshop will be an excellent networking resource for trainees of all levels to interact with and learn from former CMB students.

Spring is here, so get outside, enjoy the weather and the return of Oberon, but don’t forget to mark your calendars for this year’s CMB Retreat!
30% of Biomedical PhDs do not pursue postdoctoral training.

Those who do end up in these jobs:

- 23% Tenure-track
- 20% Industry
- 18% Government
- 18% Not research-related
- 13% Not research-unrelated
- 2% Unemployed

Intense research training from a PhD often isn’t used at all after graduation.

51% Not in research at all
67% In a research career

“From this I conclude that biomedical PhD training is a quite inefficient way to spend scarce resources, but also see no reason why that implies an obligation for PIs and research institutions to train students for non-research careers. Instead, my observations suggest that many applicants don’t understand what it takes to do biomedical research, and students who don’t like what they find in research labs are not furnished escape routes to more congenial pursuits. (Could the dearth of escape routes relate to their PIs’ need to keep those students working in the lab? I wonder.)”

-Henry Bourne, MD

After graduating from the University of Michigan, I cofounded Ebuba Corp., a Seattle-area biotechnology company, with Jeff Chamberlain. I worked with the company as its founding CSO for one year, developing its scientific and business strategy. The experience was a tremendously educational and personally valuable adventure.

I went on to do a post-doctoral fellowship with Mike McCune at the Gladstone Institute of Virology and Immunology, based at the University of California, San Francisco. My experience there transformed me from the virologist I had been when I left Michigan, into the human immunologist that I am today. My initial studies with Mike focused on regulation of immune responses in the setting of chronic viral infections. Just as important as my research, my postdoctoral fellowship taught me how to develop and fund my ideas in partnership with colleagues, that is, to do “team science”. This work and the funding that resulted from it allowed me to garner a position as Assistant Professor at UCSF.

I was recruited to the University of California, Davis in April 2013. Now, I am building a research group that is interested in the impact of immune system development on responses to vaccines and chronic infections. My team is now comprised of five scientists. Building this group and learning to work together with them has been the most rewarding and entertaining work of my career so far.

dhartigan@ucdavis.edu
CMB’s Senior Administrator, Cathy Mitchell, is retiring this July and will be dearly missed. Cathy has been a part of the heart and soul of our program since 2008. She joined CMB as the sole administrator during a period of rapid growth and has helped shape the program we know and love today.

As former CMB director, Jessica Schwartz puts it, “Cathy Mitchell became the ‘person who makes things work’ at CMB as soon as she entered our doors. She has been invaluable to students, faculty, colleagues and to CMB leadership. We will all miss her efficiency, her patience, her friendship and her wonderful smile”

Cathy helped develop and implement the annual retreat and our weekly lunch seminars, instituted an overhaul of the preliminary examination, and revamped the website and handbook. Additionally, she has been instrumental in the successful NIH grant applications for the CMB training grant, which funds a significant number of CMB trainees.

Cathy’s kindness, attentiveness, organization, and positivity have endeared her to CMB faculty, students, and staff. We can’t thank her enough for the positive impact she has had on both the program and its students.

CMB wishes Cathy a well-deserved and happy retirement. We will miss you!

And now for something different... We want your opinion

This issue of the newsletter is the fourth edition under a completely new format. While we are proud of the direction we are taking, we know there’s always room for improvement. After filling in your comments, please tear off this portion of the newsletter and leave it by the sign in sheet in the back of the room.

1. What is your favorite part of the newsletter?

2. What would you like to see more of in next year’s newsletter?

3. What is your least favorite part of the newsletter?

4. Would you prefer a new online version of the newsletter that was emailed to you? (with links to interesting articles/sources.)

5. Any ideas for new features in the newsletter?

6. Would you like to join the Newsletter committee, and in what aspects are you interested in participating? Please leave contact info.

Have an opinion on a science or program issue? Write an article! Feel like putting your editing skills to the test? Become an editor! Can’t wait to show off your awesome new data? Submit it to our bioart section! The CMB Newsletter staff is always looking for more people to write, edit, and design! Contact: Brooke Horton, bnhorton@umich.edu

CMB Newsletter Committee:
Brooke Horton, Scott Scholz, Christina Vallianatos, Corinne Weisheit, and Sara Wong

Supporting faculty:
Bob Fuller and Anuj Kumar.