The Restriction Digest

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Clear Vision: A Conversation with Jeremy Nathans

Jeremy Rotty

A glance at Jeremy Nathans' publication record reveals that the GSA Teacher of the Year has been asking and answering many of the critical questions in sensory biology. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences, as well as a Howard Hughes Investigator. Dr. Nathans co-holds a number of patents and has published over a hundred primary research articles, ranging from the cloning of rhodopsin and the human color pigments to the discovery of the basis for inherited variations in human color vision to fundamental contributions in understanding the cause and biology of retinitis pigmentosa.

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What's Inside?

The 2010 Keystone Symposia on RNA Silencing: Mechanisms, Biology, and Applications

Wan-Hee Yoon

I attended the Keystone Symposia on RNA silencing conference held in Keystone, Colorado this past January. Phillip D. Zamore of the University of Massachusetts Medical School and Beverly L. Davidson of the University of Iowa organized this meeting and around 500 researchers from all over the world came to Keystone for the meeting. Since I am working on microRNA (miRNA) in *Drosophila*, my goal for the conference was to learn how to study small RNAs in other model organisms such as *C. elegans*, zebrafish, and mice. I also wanted to see the current issues and the future directions of small RNA research. The program was designed for highlighting the similarities and differences between different small RNA pathways, to learn their molecular mechanisms, to understand the roles of small RNAs in development and disease, and to explore new methodology for manipulating these small RNAs for therapeutic applications. I learned of several major findings, highlighted below.

One major focus of the field is to understand the action of small RNA machineries. The key players of both miRNA and siRNA processing are Dicer and Argonaut (Ago). Jennifer A. Doudna at the University of California, Berkeley, and Dinshaw J. Patel at the Sloan-Kettering Institute showed the molecular

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Reflections on The Biophysical Society Meeting

Sarah Park

Conferences can be overwhelming. Massive crowds moving in ebbs and waves and spurts. Multiple exhibits, posters, and talks going on in parallel, serially, and out of phase. An unfamiliar convention center and neighborhood of the city, containing all this activity and energy. Knowing this character of conferences from prior attendance, I wondered how I would make the most out of my experience in San Francisco.

Previously, I naively jumped into the whirlpool of scientific trove and activities without a plan. I followed senior graduate students in lab to posters and presentations they had selected, believing I would get a sample of the relevant topics in the field of calcium signals and channels. I also selected talks and posters that had catchy titles without regard to any relevance to my field of research. This approach (or lack thereof) left me with very little depth but much breadth. Even then, the net had been cast so broad that having no cohesive centre in my scientific exposure left me somewhat befuddled, highly overwhelmed, and very little registered into long-term memory.

I determined I would improve on my past experiences and lessons. I attended the 2010 Biophysical Society Meeting in San Francisco, CA with purpose and a plan so as to get the most out of the experience. For purpose, I had two: 1)

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Information from Financial Aid

Congratulations to the Class of 2010. The financial aid office wishes you much success in your future endeavors.

Reminder about applying for financial aid:

The financial aid office will begin awarding aid to students that are applying for the upcoming 2010-2011 academic year in July. To apply for aid, you must complete a FAFSA (Free Application for Federal Student Aid) at www.fafsa.ed.gov . Students going on LOA for the upcoming academic year should notify the financial aid office as soon as possible.

For students receiving departmental funding, no federal financial aid will posted until all departmental aid has been posted to your account.

Repayment Options for Graduating Students:

As a recent graduate it can be overwhelming navigating the terms and conditions of your student loans. Our office would like to make the transition into repayment easier for our students. Please continue to use our office as a resource as the Financial Aid Staff will always be happy to assist you.

There is also information about the various repayment options on the Financial Aid Website under the *Debt Management*. We encourage all students to visit the website at www.hopkinsmedicine.org/financialaid, which will provide tools, such as loan repayment calculators, information of the new income based repayment option and the standard repayment plans.

Additional financial literacy and debt management websites:

Mint.com – Program to help manage your money. Provides automatic updates of spending patterns and analyzes money management behavior.

The Financial Literacy and Education Commission (FLEC) announced on April 27, the launch of its redesigned financial education website, www.MyMoney.gov The new site has enhanced interactive features and utilities to provide more resources to Americans seeking information that can assist in their personal financial decisions.

AAMC First for Medical Education (www.aamc.org/first) - Topics include credit cards, credit reports and budgeting tips. Interactive APR calculations and budget calculator.

Keystone Symposia, continued from page 1

structure of Ago and mechanism of RNA processing by using X-ray crystallography and cryo-EM. In addition to these lectures, many researchers presented posters about the mechanisms of small RNA actions, which seem very competitive.

However, I am mostly interested in the studies of small RNAs *in vivo*. The most fascinating talk was about miR-8/miR-200, a story reported by Narry Kim of Seoul University, South Korea. She was originally a big player in the miRNA mechanism field. However, she expanded her interest into model organisms. In this meeting, she showed that *Drosophila* miR-8, and its human homologue miR-200, regulates body size through the Akt pathway and identified USH as a target of miR-8 (and FOG2 as the homologous target of miR-200). When I discussed this story with her, she empathized the importance of miRNA study *in vivo*. She also acknowledged genetic interaction tests between miRNAs and their targets. Since dozens of targets have been validated *in vitro*, it is hard to know which targets are critical *in vivo*. By using *in vivo* RNAi screening, she and her colleague were able to identify USH as a target of miR-8 in the fly fat body.

Since miRNAs have been identified in *C. elegans*, many groups have been working on small RNAs in this system. By taking advantage of genetic approaches, Victor Ambros of the University of Massachusetts, a pioneer within the miRNA field, identified NHL-2 as a mediator of miRNA biogenesis by genetic screens. NLH-2 is a cofactor for the miRNA-induced silencing complex (miRISC), and enhances post-translational suppression of miRNA targets.

In *Drosophila*, Richard W. Carthew and his colleagues at Northwestern University developed interesting mutagenesis screens for identifying new genes involved in miRNA biogenesis. They used a miRNA reporter in which, under tubulin promoter, GFP combined with a miRNA target 3'UTR is expressed. They did EMS mutagenesis and were screening new genes by looking at GFP-expressing fly eyes.

The biggest difficulty of genetic study of miRNAs in higher organisms is generating knock-out animals. For example, of 171 *Drosophila* miRNAs, only 10 miRNA knock-out flies are available. However, in 2007, Phillip A. Sharp and a colleague at MIT developed the 'miRNA sponge' as a potential tool for loss-of-function study *in vivo*. They first generated a miRNA sponge construct consisting of the EGFP coding sequence combined with a 3'UTR in which many copies of miRNA binding sites are serially arrayed. Overexpression of a miRNA sponge de-repressed a miRNA reporter in mammalian cell lines. David Van Vactor and his colleagues at Harvard medical school showed that the miR-8 sponge phenocopied the neuronal phenotype of miR-8 knock-out *in vivo*. The advantage of this system is that, by taking advantage of GAL4/UAS system, they could regulate miRNA sponge expression temporally and specially. Now

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Nathans Interview, continued from page 1

Standing side by side with his excellence in research is Jeremy's continuing devotion to teaching scientists and clinicians. For his excellence in teaching Dr. Nathans has received various awards over the years from graduate and medical students alike. Having previously won the GSA Teacher of the Year award in 2003, this year's award makes him a two-time honoree.

Jeremy greets me with his characteristic warmth and good humor when I swing by for the interview. When talking with him, one always feels that he is about to bring up a witty anecdote or a wise perspective on research, science, or life in general. Our conversation ranges from books on CD (he highly recommends them, especially to commuters) to his deep respect for the incredible psychological toughness of crystallographers to the rare gift that is the scientific mindset. Jeremy's good humor and thirst for knowledge drift through every topic that comes to mind over the course of our conversation. It is exactly this conversational tone that distinguishes him as a teacher. In fact, his "Great Experiments in Biology" course is a popular and well-attended class and is, as I and many of my peers can attest, well worth auditing or taking for credit mainly because it blends equal parts history, storytelling, and science.

"Teaching is certainly something you can learn to do," he says, "I don't think I started out being that good a teacher. I've given enough lectures to know that the first time you give a lecture, it's not the best. It takes a few times to smooth out the rough spots and to figure out in your head what you want to emphasize."

It's clear that his teaching philosophy is reflected in his lectures: "The best lecturers are storytellers. Really I think it is telling a story. The story can hang around a person or people, historical events, techniques…there are so many hooks to hang a story on. And people are naturally drawn to a narrative. You don't think in terms of lists. What resonates with students, and people in general, is a story."

Even though there may be lists that are worth knowing, such as indicators of a heart attack that let doctors respond as it is happening, Jeremy says that "what resonates with me 25 years later is a patient I saw in the emergency room: This is Mr. Jones, he has chest pains…this is what he looked like, this is what we did next. I think it's true in science too. You can learn a lot from the stories in science. I think the most informative way to think about science, if you're a scientist, is not to just think about the answer. Think about the process, especially the excitement of the chase."

As he teaches, one cannot mistake this excitement as he recalls, for example, the process by which ubiquitin was discovered and characterized. If one thing describes Jeremy professionally, it is arguably his fundamental love of science. "I love doing science. I love thinking about it, talking about it, reading about it." Even as a PI, Jeremy never finds himself far from the lab bench.

Where does he trace this love of science back to? "I guess I have to mention one influence: My father. Although I have to say that while he was drawing restriction maps in the living room in the evenings when I was a kid, I was out playing basketball. I guess the thing I was struck by was that he looked like he was having fun. That certainly stuck with me as a kid. But I guess I got interested in science in high school, mostly due to some good teachers I had."

Does he still look at science as being fun, being an adventure? "Yes. Absolutely. I think having fun is an integral part of doing creative science. I think if you find yourself thinking about science when your mind is wandering, if you have that predilection then you're in the right business."

As an undergraduate at MIT, Jeremy double majored in life sciences and chemistry. From there, he completed an M.D./Ph.D at Stanford and did a postdoc at Genentech before being hired by Hopkins. The linear progression from undergraduate to professor is the dream of many a graduate student. Did he have a clear idea of what he wanted to accomplish professionally, or did college sort of open his eyes to new possibilities?

"I think I was pretty undifferentiated," he says, "I went to MIT and I was certainly inclined toward math and science. It's hard to remember thirty years later, but I think I went to graduate school pretty open-minded. I was pretty sure I was going to do research but there was always the possibility of practicing medicine. During the course of it I got the sense that you couldn't do everything.

"To do something well, you've got to focus on it," Jeremy articulates a piece of advice that all graduate students would be wise to bear in mind, "I realized I was pretty good at lab work and really liked lab work. Although the clinic was great and it was a great privilege for me to be in the hospital, the chance to see patients, I figured I might as well do the thing I'm good at. I didn't do an internship or residency. I went straight into a postdoc."

Throughout our lively conversation, Jeremy remains energetic, insightful, and humorous. For example, when asked about what brought him to Hopkins he laughs and says: "They made me an offer!"

Additionally, he found a group at Hopkins composed of young PIs who all grew together through the years to compose the present core of the Department of Molecular Biology and Genetics: "I interviewed around and at that time, the mid-80's, the Molecular Biology and Genetics Department was expanding. There was plenty of lab space and they were hiring a bunch of people like Jef

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OPENING RECEPTION FOR MEDICAL AND BIOLOGICAL ILLUSTRATION EXHIBIT!
-WINE, CHEESE AND MUSIC PROVIDED-

Artwork by the graduating class of the Department of Art as Applied to Medicine is now available for viewing until June 12th.

The work featured includes surgical, anatomical, editorial, biological, molecular illustrations and animations and 3D art created by Shizuka Aoki, Neil McMillan, Beatriz Martin-Villalba, Stephanie Sadler, Joseph Samson and Elizabeth Weissbrod.

The Master of Arts degree in Medical and Biological Illustration results from two years of course work in artistic technique, anatomy, physiology, histology, pathology, biology and surgical concepts.

The Department of Art as Applied to Medicine was the first program of its kind in the world. It was founded in 1911 by Henry Walters and directed by Max Brödel, illustrator to Hopkins physicians and surgeons since 1894. The department archives contain over 1000 original works by Brödel, his colleagues and early students. Since then, Hopkins has remained at the forefront in training medical illustrators to advance medical education and continue its tradition of excellence into the 21st century.

www.hopkinsmedicine.org/medart/

For more information, please contact Elizabeth Weissbrod – eweissb1@jhmi.edu – 410-955-3213

Keystone Symposia, continued from page 2

they have finished the construction of all 152 *Drosophila* miRNA sponges, and they will have transgenic flies soon.

Some researchers approached their work with the goal of understanding the *in vivo* role of miRNAs as buffers or fine-tuners in gene regulatory circuits because many of the miRNA mutant organisms did not show dramatic phenotypes. Besides, some miRNAs had been shown previously to play a role in setting thresholds for gene expression and activity. Phillip A. Sharp presented the relationship between miRNAs and threshold from an engineering point of view. By using miRNA reporter assays *in vitro*, he showed that the number and strength of miRNA binding sites determined threshold. As they increased these miRNA binding sites, the system showed ultra-sensitivity.

In addition to the talk about animal miRNAs, many researchers presented studies of plant miRNA. The big differences between animal miRNAs and plant miRNAs is that plant miRNAs are mobile through xylem and phloem and miRNA biogenesis in plants is much more complicated than that of animals. One of miRNA's role in plants is stabilization of environmental stress. Plants may have more AGO systems because they cannot move. Therefore, they need more stress-solving tools.

Other researchers are looking for novel small RNAs by using high-throughput technologies like deep sequencing. People in this field are very competitive and the pace of new discoveries is fast. I felt that it was like a gold rush.

I met many enthusiastic researchers in the poster session. We shared useful information and had many productive discussions, and made new friends there. During the conference I was also able to enjoy hiking and saw the amazing beauty of Keystone Mountain.

Before attending this conference, I had tested the role of miRNAs in *Drosophila* only by genetic methods. I had not had the chance to study other model organisms or learn about new methods to test miRNAs *in vivo* previously. Thanks to GSA travel awards, I was able to attend the RNA silencing Keystone conference. The learning experience at the Symposium was directly helpful for my research project. Moreover, I was exposed to many other fields of small RNAs such as *in vitro* mechanisms and small RNA mining, and had the opportunity to communicate and network with other researchers.

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Boeke, Randy Reed, that just seemed like a great group of young scientists. It seemed like a good fit for me."

It's clear that his time in science has forged a distinct philosophy toward mentoring that characterizes his relationship with the people through the years who have done research alongside him at Hopkins. "I think everyone has a different style. There's no one right style. It's a lot like parenting, actually. I think each student or postdoc or technician you're interacting with is different. It's not a one mold fits all."

Jeremy's time in science has also shown him that timing is everything and that the PI is not infallible. "I think you have to really understand what that person needs at the moment, how much or how little attention they need. People need freedom. You can't breathe down their necks. I try to make myself available to people. I try to keep an eye on things but I don't want to be a micromanager. In any case, let's be honest: The PI doesn't always know what's right. Sometimes the student knows better. I think the main things are communicating, thinking about a problem from all different angles, interpreting data critically…those are common to most advisors."

Having accomplished so much in science, I wondered if Jeremy had any 'scientific regrets'. Was there ever an abandoned problem he wished he'd stayed? Is there a diverging road he wished he'd gone down?

"Science is littered with these 'if only' stories. There have been some things that in retrospect it seems we were awfully slow in figuring out. Everything is obvious in retrospect. There were certain areas we considered working in and didn't either because we felt we didn't have anything unique to contribute or we didn't have the technical ability to do the experiment the right way."

From there, Jeremy enters into a historical reminiscence concerning the history of the visual pigment field and, more specifically, the concerted effort to solve the crystal structure of rhodopsin that went on for the better part of twenty years. So many people were trying rhodopsin that Jeremy estimates hundreds of years worth of cumulative time went into the work.

Over the course of this mini science history lecture Jeremy concedes that while he was interested in solving the structure in the end he says, "A lot of crystallographers, especially those who had experience in crystallizing membrane proteins, were trying rhodopsin. In the end we never tried to. There were so many good people working on that area."

The structure was eventually solved by a Japanese scientist by the name of Okada. "It was a breakthrough," Jeremy says, clearly appreciating a beautiful piece of science, "But do I regret it? Not really."

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Seek information specifically associated with calcium signaling and channels to get up-to-speed on "current events" that may possibly help me troubleshoot glitches I have encountered in my project, and 2) explore a few fields of research outside of my area of study to test where my interests lie for future direction. As for a plan, when I scoured the abstracts, I targeted talks and posters that fell in the following categories: electrophysiology, molecular engineering, pharmacology, and optics, with priority given to those that fell into multiple categories at once. And each day of the conference saw me with a prioritized list to which I systematically adhered.

The plan worked relatively well. Two talks in particular caught my attention. One was a presentation titled, "Photopharmacology: Controlling native voltage-gated ion channels with light," work done in Dirk Trauner and Richard H. Kramer's labs. The group designed photochromic ligands/blockers for ion channels and used light to block/unblock calcium, potassium, and/or sodium channels. They studied a variety of chromophores, engineered by binding different chemical groups to one of the benzene rings, allowing for tuning in various properties, such as channel selectivity, membrane permeation potency, change sensitivity, thermostability, and the wavelength at which the chromophore activates and deactivates the channel(s). In particular, I was curious to know more about QAQ, a membrane impermeable analogue that photoregulates Nav (NaV1.1-1.4, 1.6, 1.7) and Cav (N- & L-type) channels. The chromophore could be applied to channels via patch pipettes or by non-selective cation channels, such as TRPVI (P2X7R). The latter method was tested in HEK cells, hippocampal neurons, and sensory neurons. With the progress of optogenetics, the ability to engineer the chromophores to affect channel function seemed a welcome addition to the field.

The second presentation that caught my attention was titled, "T-driven activation of thermoTRPs: a distinct pathway involved," work done in Jie Zheng's lab. The elements that caught my attention were the composure and clarity exhibited by the presenting student and the curious properties of the polymodal TRPV1 channel. The presenter demonstrated that TRPV1 uses different activation pathways in response to voltage, ligand, and temperature. Voltage activation plateaus at +160 mV whereas temperature activates beyond +160 mV. Voltage and ligand first activates TRPV1 after which heat further activates the channel. Functional studies were paired with structural studies. By performing FRET with fluorescein as donor and rhodamine as acceptor, it was shown that the outer pore was important for temperature activation. With temperature activation, the outer pore turret moved closer. However, the movement was absent with voltage or ligand activation. I found this presentation succinct and found the work elegant. I also realized that as much as I would like to blow away the field of science with a novel and life-changing discovery, it is just as valuable and worthwhile to per-

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Like everyone who does research, Jeremy has gone through his share of peaks and valleys, times where the data is flowing and times when nothing seems to be working. As a young graduate student, Jeremy set forth to transform Drosophila in the days before P elements.

"We did thousands and thousands of embryos and it was a complete bust. Clearly this was not a thesis project that was going anywhere, so I had to look around for something else. And so then I got onto the issue of pigments. But the first couple years of that were also dry. We were trying to clone the rhodopsin gene. Things that are trivial now were difficult then. It took a long time to isolate the message of what turned out to be the most abundant protein in the retina."

He pauses, considering the question of how to get out of those valleys, "Was there any secret to it? Not really. I think it was just hard work and perseverance and some hard thinking. It's sort of like playing cards. You gotta know when to hold 'em and when to fold 'em." During his teacher of the year lecture he emphasized the need for mental toughness, wide surveying of the literature, writing down ideas, keeping a neat and thorough lab notebook, and thinking about how every experiment one does might fit into the story you're trying to craft.

Moving forward from graduate school, we all wonder what the next step will be in our careers. Should we all do postdocs? "It's easy to follow the most beaten path, which is to do a postdoc. It's a big, wide world out there. There are many things that one can do in addition to lab work that are important to society and use the skills we have been trained at."

Many of us in science take the basic mental skills we've acquired for granted. Jeremy elaborates further to illustrate the broad applications available to the scientifically rigorous mind, "We know things like what a control experiment is or statistical significance of data. There are lots of things that we think are second nature but as you look out into the world you'll see that people cannot think in a logical, rational, objective manner about the data…the skill set that we have acquired, especially with respect to thinking about data, actually turns out to be incredibly valuable. Probably because it is less universal than we would suppose."

Laughing he adds, "And it's psychologically great to see your options as so wide-open!"

Speaking of postdocs, I wondered what took Jeremy to Genentech for his postdoc instead of, say, to a top-notch academic institution. "That was a time when there weren't very many biotech companies. I was really impressed with the quality of work coming out of Genentech. They had a strong tradition of publishing like an academic institution. It was also just a world I was curious about."

"And also I got advice from my academic mentors which really made me want to do it. Each one of them told me not to do it!" He laughs heartily and continues, "Every single faculty member told me, 'Oh no, you don't want to go into industry. That's not where the action is.' And I just thought they were wrong. Based on what Genentech was doing, that *was* where the action was. And also my wife had just started a postdoc and Berkeley, so I had to stay in the Bay Area for awhile."

Moving back to Baltimore after his postdoc gave Jeremy the chance to move closer to family. "I actually live six blocks away from my childhood home," he says, "It's great. You see a lot of family that way." When the subject turns to leading a balanced life, Jeremy responds by saying, "I like to read: biography, history, pretty much everything. Spending time with my kids, especially when they were younger, my family was my major hobby. That's the ultimate thing."

Framed reproductions of his kids' artwork outnumber anything else on the walls of his office. He proudly points out several of them along the way, perfectly illustrating his point on balance. Framed photos of his family dominate the space along one wall of his office. During our conversation, he recalls often coming home exhausted as a young PI and reading to his kids, many times falling asleep before they did! Jeremy says that spending time with his kids was his main form of relaxation for over a decade.

"I doubt there are very many people who on their deathbed wish they had spent more time at the office," he says, articulating a truth as fundamental as the search for meaning inherent in the scientific endeavor. It is, perhaps, the most ringing of truths in a conversation full of them. As he said during his teacher of the year lecture: "Read lots of books, paint, dance, go to the gym, volunteer in the community. Develop friendships."

So what brought him back to academia? "I like the freedom to change direction, to do your own thing, not be product oriented. I also liked teaching. There are things that companies don't have. Also, there's a youthful aspect to academia that appeals to me."

Molding young minds? "Or being molded by them!" he laughs, "Letting that youthful excitement rub off on me."

Jeremy also considers academia more prone to ask profoundly shocking questions, "Also, the encouragement of ideas that are a little wackier in academia, which is part of the fun. Look at RNAi. If you'd gone up to someone in 1980 and told them [about the process of RNAi], the response would have been: 'Maybe, but that's pretty wacky.'"

After all of his insights into the scientific endeavor and his advice to young scientists, I ask him whether he has plans to write an autobiography. "I haven't thought of it that way.

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I do keep a subset of my letters and email, just as a longitudinal section of what I was thinking over time. I also save my ideas. I always write them down. It's a scientific diary, but it would not make very interesting reading."

Jeremy allows that maybe somewhere down the line he could be open to the possibility but cautions, "One thing that's a little intimidating if you're going to do something like that is that so many scientists have already done that so well, so the bar has already been set very, very high."

As our conversation draws to a close, I ask Jeremy whether he has any parting words of advice to the graduating class of 2010. "Be supportive of each other. Because if you're at the peak of your time, someone else is at their valley and you can help them. It is like a family here. That's an incredibly important part of what Hopkins is all about."

His final words of encouragement touch deeply on perhaps the fundamentals of doing science and in being fulfilled by the work. "I would also say enjoy it, in the best sense of the word. It's a great privilege, thanks to the taxpayer deciding that a bunch of twenty-somethings running around in lab is worth their money."

He laughs at this and says in closing: "It's a great privilege and we're very lucky."

Perhaps that is the most important lesson that this year's GSA Teacher of the Year will impart to us.

Our Next *Restriction Digest* Deadline is August 2nd!

If you would like to have your work published in *The Restriction Digest,* or to become a part of the editorial team, please contact an editor:

Elizabeth Eyler (ehuang11@jhmi.edu)
Christina Fuentes (cfuentes@jhmi.edu)
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We welcome all submissions including, but not limited to, articles, interviews, restaurant reviews, cartoons, pictures, advertisements for clubs and organizations, fiction, and non-fiction related to graduate student life.

Please visit us on the web at: **http://www.hopkins-medicine.org/gsa/newsletter/index.shtml**

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severe and bring to light the smaller intricacies of biological life that make the whole fascinating and awe-inspiring.

Looking back, I consider my trip to the 2010 Biophysical Society Meeting to have been productive. As in the past, I saw the vastness of the field of science. This time though, I was able to appreciate specific work that generated excitement and stimulated my imagination. Additionally, I felt I had achieved a small, personal victory with my purposes and plan for this conference.

JHSAP
Johns Hopkins
Student Assistance Program
Serving Graduate and Professional Students

Maintaining a Healthy Relationship with Your Spouse or Dating Partner

Studies show that healthy relationships make us happier, improve our well being, and can offer health benefits. Conversely, unhealthy relationships can damage our self esteem and cause stress and anxiety. But how do you know if your relationship is healthy? Healthy relationships include balance, trust, respect, support and good communication. Consider the following as you assess the health of your relationship.

Balance

- Does each of you maintain and respect healthy boundaries?
- Does each of you feel free to express your opinion?
- Does your relationship allow for change and growth?
- Is time spent with friends and family encouraged and respected?
- Does your relationship get in the way of school, work, or other commitments?
- Are your friends and family happy about your relationship?

Trust

- Are you honest with each other?
- Are you able to be yourself when you are together?

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- Does you or your partner say one thing but mean another?
- Can you depend on each other?

Respect
- Do you treat each other with respect and kindness?
- Is either of you overly negative or critical?
- Has either of you ever acted in a threatening manner?
- Do either of you have a problem controlling anger?
- Do you argue on a regular basis?
- Do either of you have a problem with alcohol or drugs?

Support
- Are you gaining something positive from your relationship?
- Do you feel cared for and valued?
- Does spending time together make you happy?
- Do you feel positive about your relationship?

Communication
- Is there equal and open communication in the relationship?
- Do you ask for each other's opinions?
- Do you listen to each other and try to see things from the other's point of view?
- Do you share helpful information with each other?
- Does each of you share a genuine interest in what the other has to say?

Conflict

Conflict in a relationship is normal. But how you handle conflict can make or break a healthy relationship. The goal of a conflict should be compromise. If you handle conflict the right way, you can diffuse the anger and come to common ground, a win-win situation. However, if you argue unfairly, you will not reach a compromise and neither one of you will be happy. Here are some common pitfalls to avoid when dealing with conflict in a relationship, as well as tips for positive communication during disagreements.

Common pitfalls
- Refusal to listen to the other's point of view.
- Using disrespectful language or name calling.
- Assuming you know the other person's motives or thoughts.
- Refusal to compromise.
- Bringing up past events to fuel the argument.
- Refusal to apologize.
- Arguing when you are too angry.
- Planning what you are going to say next while the other is talking.

Tips for positive communication
- Be open to hearing the other person's point of view, even if you disagree.
- Show your partner you are listening by restating what you heard them say.
- Avoid blame and judgment. .
- Allow your partner to explain and don't interrupt.
- Discuss the issue without bringing up things that happened in the past.
- Admit that you may be wrong – saying you are sorry can go a long way toward solving conflict.
- If you are angry, give yourself time to calm down before talking.
- Really listen to the other and respond to their points.
- Attack the problem, not each other.
- Be willing to give and take.

Seek assistance

The Johns Hopkins Student Assistance Program (JHSAP) is committed to assisting students in managing the challenges they face during their academic careers. JHSAP provides support to students in dealing with personal, academic, and relationship problems.

Getting help is free, easy, convenient, and confidential. Our goal is to get to know you, understand the challenges you are facing, and to discuss how to move forward in a healthy way. To this end, the JHSAP offers a variety of services including:

- Assessment of your current concerns.
- Brief, supportive counseling.
- Referral to appropriate and accessible community services and resources.
- Consultation that supports academic and/or professional development.
- Immediate support and management for crisis situations.
- Dean, Faculty, and Staff consultations.
- Risk assessment for students.
- Training, education, and outreach.

For more information contact the Johns Hopkins Student Assistance Program at 443-287-7000 or visit our website at www.jhsap.org

Congratulations to the Graduates of 2010!

The Graduate Student Association of the Johns Hopkins University School of Medicine congratulates you on your accomplishments, and wishes you continued success in the laboratory and life.

Master of Arts

Shizuka Naomi Aoki, of Ontario, Canada; Medical and Biological Illustration • **Tiffany Delight Helling**, of Berkeley, CA; Human Genetics and Molecular Biology • **Molly Hyde**, of Waterville, ME; Biochemistry, Cellular and Molecular Biology Training Program • **Janette Lebron**, of Towson, MD; Cellular and Molecular Medicine • **Beatriz Martin Villalba,** of Madrid, Spain; Medical and Biological Illustration • **Audrey Maryam Moshfeghian**, of San Antonio, TX; Human Genetics and Molecular Biology

Master of Science

Robert James Borotkanics, of Kensington, MD; Health Sciences Informatics • **Naima Lexi Carter-Monroe**, of Gwynn Oak, MD; Health Sciences Informatics • **Laurent Laor**, of New York, NY; Health Sciences Informatics • **Paula Jeanne Soper**, of Baltimore, MD; Health Sciences Informatics

Doctor of Philosophy

Soumyadipta Acharya, of Akron, OH; Biomedical Engineering • **Jobert Guerrero Barin**, of Glendale, CA; Molecular Biology and Genetics-Program in Immunology • **Clara Margaret-Louise Bien**, of Ann Arbor, MI; Biochemistry, Cellular and Molecular Biology Training Program • **Tullia Carmela Bruno**, of Erie, PA; Molecular Biology and Genetics-Program in Immunology • **Pei-Lung Chen**, of Taipei City, Taiwan; Human Genetics and Molecular Biology • **Donavan Tai Suan Cheng**, of Toronto, Ontario, Canada; Biomedical Engineering • **Zhikai Chi**, of Beijing, China; Neuroscience • **Jessica Downey Church**, of North Kingston, RI; Cellular and Molecular Medicine • **Carey Elizabeth Connelly**, of Yardley, PA; Biochemistry, Cellular and Molecular Biology Training Program • **John Thomas Cunningham**, of Shepherdsville, KY; Biochemistry, Cellular and Molecular Biology Training Program • **Erika Lynn Darrah**, of Pottstown, PA; Molecular Biology and Genetics-Program in Immunology • **Greg Michael Delgoffe**, of Menominee, MI; Molecular Biology and Genetics-Program in Immunology • **Elizabeth Jane Denning**, of Baltimore, MD; Program in Molecular Biophysics • **Christopher Jon DiMattina**, of Endicott, NY; Neuroscience • **Wei D. Duan-Porter**, of State College, PA; Biochemistry, Cellular and Molecular Biology Training Program • **Kamau Mudada Fahie**, of Worcester, MA; Biochemistry, Cellular and Molecular Biology Training Program • **Jonathan Kroemer Fallon**, of Beverly, MA; Human Genetics and Molecular Biology • **Charles Ira Fisher**, of San Diego, CA; Biomedical Engineering • **Katherine Elizabeth Frato**, of Baltimore, MD; Program in Molecular Biophysics • **John Gallagher**, of Los Altos, CA; Program in Molecular Biophysics • **Anastasia Gentilcore**, of Brooklyn, NY; Program in Molecular Biophysics • **Derese Getnet**, of Upper Darby, PA; Molecular Biology and Genetics-Program in Immunology • **Courtney Rory Goodwin**, of West Palm Beach, FL; Neuroscience • **Melissa Grafe**, of Wernersville, PA; History of Medicine Ph.D. Program • **Kathleen Elizabeth Greenberg**, of Columbus, OH; Cellular and Molecular Medicine • **Tamia Alisha Harris**, of Atlanta, GA; Cellular and Molecular Medicine • **Yasmin Lucy Hashambhoy**, of Toronto Ontario, Canada; Biomedical Engineering • **Sarah Elizabeth Hemminger**, of Carmel, IN; Biomedical Engineering • **Kaoru Hida**, of Los Angeles, CA; Biomedical Engineering • **Xin Huang**, of Beijing, China; Pharmacology and Molecular Sciences • **Maimon Eid Hubbi,** of Newark, NJ; Cellular and Molecular Medicine • **Youngtae Jeong**, of Pasadena, MD; Pathobiology • **Lesley Ann Kane**, of Mississauga ON, Canada; Biological Chemistry • **Bingnan Kang**, of Guangzhou, China; Pharmacology and Molecular Sciences • **Andrew Yong Chae Kim**, of Seattle, WA; Biochemistry, Cellular and Molecular Biology

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Training Program • **Deok-Ho Kim**, of Seoul, Korea; Biomedical Engineering • **Yu Shin Kim**, of KangWon, South Korea; Neuroscience • **Sarah Kolitz**, of Boston, MA; Program in Molecular Biophysics • **Christine Marie Ladd-Acosta**, of Shrewsbury, MA; Cellular and Molecular Medicine • **Melissa Anne Landek-Salgado**, of Bridgeview, IL; Pathobiology • **Carolyn Lauzon**, of Wilbraham, MA; Program in Molecular Biophysics • **Rebecca Jane Leary**, of Norwalk, CT; Cellular and Molecular Medicine • **Chang-Hun Lee**, of Seoul, Korea; Biological Chemistry • **Hanwei Li**, of Cupertino, CA; Biomedical Engineering • **Xiong Li**, of Beijing, China; Biomedical Engineering • **Yu Li**, of Clarksville, MD; Molecular Biology and Genetics-Program in Immunology • **Yun Liu**, of Shanghai, China; Biochemistry, Cellular and Molecular Biology Training Program • **Yihua Loo**, of Singapore; Biomedical Engineering • **Nicolette Alexandrea Louissaint**, of Brooklyn, NY; Pharmacology and Molecular Sciences • **Corrin Ellisia McBride**, of Baltimore, MD; Biochemistry, Cellular and Molecular Biology Training Program • **David Mark McGaughey**, of University Park, MD; Human Genetics and Molecular Biology • **Julie Schafer McGurk**, of Flemington, NJ; Neuroscience • **Michael Adam Meledeo**, of Yukon, OH; Biomedical Engineering • **Christopher Richard Merritt**, of Fairfield, OH; Biochemistry, Cellular and Molecular Biology Training Program • **Matthew Miskimon**, of Perry Hall, MD; Neuroscience • **Maria del Rocio Montes de Oca**, of Mexico City, Mexico; Biochemistry, Cellular and Molecular Biology Training Program • **Andrea Mountney**, of Harleysville, PA; Pharmacology and Molecular Sciences • **Sabina Angela Muend**, of Dunlap, IL; Cellular and Molecular Physiology • **Philip John O'Herron**, of Vienna, VA; Neuroscience • **Saurabh Paliwal**, of Baltimore, MD; Biomedical Engineering • **Yu-Cheng Pei**, of Taipei, Taiwan; Neuroscience • **Lukas Wyatt Pfannenstiel**, of Hutchinson, KS; Cellular and Molecular Medicine • **Christopher Michael Puleo**, of Utica, NY; Biomedical Engineering • **Yan Qi,** of Hangzhou, P.R. China; Biomedical Engineering • **Srivatsan Raghavan**, of Pittsburgh, PA; Biomedical Engineering • **Nicole Ada Rapicavoli**, of Bolinas, CA; Biochemistry, Cellular and Molecular Biology Training Program • **Shruthi Ravimohan**, of Baltimore, MD; Human Genetics and Molecular Biology • **Zachery Roger Reichert**, of Crystal Lake, IL; Pharmacology and Molecular Sciences • **Qiuting Ren**, of Liaocheng, China; Biological Chemistry • **Elisha Delaney Oglesby Roberson**, of Dawson Springs, KY; Human Genetics and Molecular Biology • **Kaoru Sakabe**, of Rockville, MD; Biochemistry, Cellular and Molecular Biology Training Program • **Christopher Holden Pierce Salguero**, of Syracuse, NY; History of Medicine Ph.D. Program • **Juan Ignacio Sbodio**, of Santa Fe, Argentina; Biochemistry, Cellular and Molecular Biology Training Program • **Tilman Hans Jorg Schneider-Poetsch**, of Erftstadt, Germany; Biochemistry, Cellular and Molecular Biology Training Program • **Jeffrey John Shaw**, of Madison, WI; Biochemistry, Cellular and Molecular Biology Training Program • **Dong Shen**, of Shreveport, LA; Human Genetics and Molecular Biology • **Joshua Sims**, of Baltimore, MD; Program in Molecular Biophysics • **Patricia Sara Arauz Soucy**, of Louisville, KY; Biomedical Engineering • **Tomeka Lynette Suber**, of Wilmington, NC; Cellular and Molecular Medicine • **Stephanie Kenfack Tankou**, of Baltimore, MD; Cellular and Molecular Medicine • **Brock Michael Tice**, of Mandeville, LA; Biomedical Engineering • **Joshua Tzvi Cardin Vogelstein**, of Baltimore, MD; Neuroscience • **Karl Jonas Wahlin**, of Baltimore, MD; Neuroscience • **Kimberly Martha Walter**, of Baltimore, MD; Pathobiology • **David Hong-En Wang**, of Baltimore, MD; Cellular and Molecular Medicine • **Xiaoyue Wang**, of Beijing, China; Biological Chemistry • **Jennifer Rose Wehner**, of Byron, IL; Pathobiology • **Jeffrey Lawrence Werbin**, of New York, NY; Program in Molecular Biophysics • **Kenneth Whitaker Witwer**, of Elkridge, MD; Biochemistry, Cellular and Molecular Biology Training Program • **Jing Xu**, of Zhenjiang, China; Pharmacology and Molecular Sciences • **Tingting Yang**, of China; Biomedical Engineering • **Jeffrey Min-In Yau**, of High Bridge, NJ; Neuroscience • **Xin Ye**, of Chegdu, China; Biochemistry, Cellular and Molecular Biology Training Program • **Ying Ye**, of Beijing, China; Pathobiology • **Zhaohui Ye**, of Xiamen, China; Molecular Biology and Genetics-Program in Immunology • **Hongyan Yin**, of Rong Cheng, China; Biological Chemistry • **Jihye Yun**, of Seoul, South Korea; Cellular and Molecular Medicine • **Shawn Patrick Zack**, of Plano, TX; Functional Anatomy and Evolution • **Jun Zhong**, of Nanjing, China; Biological Chemistry • **Jian Zhu**, of Wuxi, People's Republic of China; Pharmacology and Molecular Sciences