Our Newly elected GIN Committee

New officers in italics...

GIN Co-Presidents: Kate O’Toole and Sara Freeman

Secretary: Rachel Stewart

Treasurer: Amy Anderson

Webmaster: Santiago Archilla and Nikki Sawyer

Frontiers in Neuroscience: Jeanne McKeon and Debra Cooper

Treasurer in Training: Lisa Matragrano

DSAC: Jacob Shreckengost

Central Sulcus Editors: Amy Mahan and David Ehrlich

GSC: Kalynda Gonzales, Lisa Matragrano, Chris Makinson

Assistant to the Editors: Lucy Guillory

Contents:

2008-2009 GIN officials 1

Off the Beaten Path: Nonacademic Careers 2

Interview with Dr. Robert Lui 3

Radiation didn’t give me super powers 4

Philosopher’s Corner 5

Things you didn’t know you could do with a PhD 5

The Printables 8

Famous Graduate Students 9

Events in Atlanta 9

Emory Calendar
• August 28: First Day of Classes
• September 6-7: Neuroscience Retreat

2008 Thesis Defenders

1/17/2008 Tommy Guillot (Andrew Miller)
2/25/2008 James Lee (Lian Li)
3/11/2008 Sara Dodson (Alan Levey)
3/21/2008 Adam Orr (Xiao-Jiang Li)
4/15/2008 Gillian Hue (David Rye)

2008 Incoming students

Catherine Barrett (Penn State)
Andrew Brooks (Mercer Univ)
Monica Chau (UC Davis)
Ming-Fai Fong (MIT)
Lanikea King (Univ of Hawaii)
Laura Mariani (Brandeis Univ)
Abraham Mathai (Univ of Pune, India)
Callie McGrath (Boston College)
Karen Murray (Lafayette College)
Christina Nemeth (Hamilton College)
Yvonne Ogbonnwan (Georgia State)
Kathryn Shepard (Ithaca College)
Off The Beaten Path: Nonacademic Careers of Neuroscience Graduates

Amy Mahan, Editor

In the past, graduates of the Emory Neuroscience program have been very successful at obtaining academic post-docs and then professorships at many prestigious universities. However, many of us are uncertain if we want to follow the traditional career path. Below are the profiles of three very successful alumni who have pursued other career paths. They highlight some of the many opportunities that are available to Emory graduates with a PhD in Neuroscience.

Brenden Gingrich, Ph.D., 1999
Former Advisor: Tom Insel
Patent Attorney, Partner
Knobbe Martens Olson & Bear LLP

I completed my Ph.D. at Emory in August 1999. My advisor was Dr. Thomas Insel, who is now Director of the National Institute of Mental Health. My graduate work in his lab focused on the neurobiological basis of social attachments. We used prairie voles as an animal model of attachment, since they are one of the few rodents that form pair bonds after mating.

I became interested in patent law as a possible career path when one of my former professors at Emory left to join a law firm in Atlanta. He turned to talk to us about the possibility of law as an alternative career at about the time I was beginning to consider where to do my post-doctoral work. After looking into it more, and talking with a fellow graduate student who left the Ph.D. program early to attend law school, I decided law was a better fit for me.

After completing my Ph.D., I went to law school at the University of Virginia School of Law. I thoroughly enjoyed my time at UVA. I found that my graduate training had prepared me well for law school. While I didn’t have the background in history or policy that some of my classmates had, I found that the ability to think critically and reason well that graduate school had taught me more than made up for it.

In September of 2003, after finishing law school and a one-year clerkship for a federal judge, I started at Knobbe, Martens, Olson & Bear, LLP, a southern California-based intellectual property law firm. I was made partner at the firm in January of this year. My practice focuses on obtaining patents for the biotechnology and medical device industries. The majority of my time is spent trying to convince the Patent Office that my client’s inventions are patentable. Almost every patent application is rejected by the Patent Office the first time it is examined, usually based on the argument that someone else has already invented the same thing, or that the invention is an obvious extension of what is already known. In response, I prepare written arguments that are based on both the science of the invention, as well as patent laws. I enjoy the work because it is not focused on a single aspect of science like my graduate work – I currently represent clients with technology in the fields of antisense therapy, molecular biology and genetics, pharmaceuticals, intravascular ultrasound, blood purification, microfluid processing, and surgical fasteners. If you are considering a career in patent law, I invite you to take a look out our firm’s website at www.kmob.com.

Gillian Hue, PhD, 2008
Former Advisor: David Rye
Postdoctoral Fellow: Science Education and Ethics, Emory University

I defended my dissertation on a Tuesday afternoon. Wednesday morning I reported for duty at my post doc position in the Program in Science and Society here at Emory. I guess I didn’t feel like I needed a day off because this is a job they probably could have convinced me to do for free.

I ended up in the graduate program in Neuroscience because, for as long as I can remember, I’ve been curious about why (and how) we do the things we do; as cellular organisms, as individuals, as a society. As a grad student researcher, I worked in the laboratory of David Rye, who fostered and rewarded curiosity and allowed me the freedom to become involved in several educational opportunities. From a perspective of interdisciplinary research and teaching, I became increasingly interested in the interactions between science and society, how science is understood and perceived by Joe Everybody, and particularly how science is taught.

During my post doctoral fellowship I will be working on several projects that are related to Science Education and Ethics. In addition, a portion of my funding comes from the
PI Personals: Dr. Robert Liu
Sara Freeman, Field Reporter

When did you start at Emory?
Formally, I started in January 2005, but traveled back and forth between Atlanta and San Francisco for the first few months. I was setting up the lab and writing animal protocols. I moved with my family to Atlanta at the end of May of 2005, a month after my son Alex was born. Active research in the lab began in June after that.

Tell us about what your lab studies.
The simple answer would be mammalian auditory processing of communication sounds, but what I think my lab is mainly known for is studying neural coding, and the computational analysis of neurobiological data.

And where did you work before Emory?
I was a Sloan-Swartz postdoctoral fellow for the UCSF Sloan-Swartz Center for Theoretical Neurobiology, and I had three very different mentors: a theoretical neuroscientist who studies vision named Ken Miller; Mike Merzenich, who is a pioneer in the field of cortical plasticity; and, the mentor who gave me the most advice, Christopher Schreiner, who studies the representation of complex sounds in the central auditory system.

What do you miss the most about San Francisco?
Good Chinese food.

You received both your bachelor’s and doctorate degrees from Stanford in physics, but now you’re working in neuroscience—what inspired the change? How did you become interested in the work you’re doing now?
As a graduate student, everyone reaches the point when they think about what they want to do with their lives. I was inspired by the physics work I was doing, but I always thought of my physics degree as an enabling tool to apply quantitative methods to other questions. When I was thinking of what kind of career I would want, some friends in graduate school who were studying neuroscience pointed me toward some sensory systems papers using theoretical approaches. It got me interested in how information theory, which is used in some of the physics I was studying, could be applied to sensory neural coding. What is it that neurons are telling you about the sensory world? What are the fundamental limits of perception? The topic provided a natural bridge from my physics training to the work we do now using quantitative methods to address biological questions.

What first sparked your interest in science when you were younger?
Hmm... LEGO’s maybe. Building stuff and seeing how things fit together. LEGO’s were probably my favorite toy as a child, and I liked modeling objects with them.

What kinds of things do you like to do outside of the lab?
Play with my son Alex, who’s now 3 years old. Find tasty restaurants in Atlanta. I used to play a lot of volleyball in graduate school, but not so much these days.

Summer vacation is around the corner. If you could travel anywhere in the world, where would you go?
Well, we are going to California, but if I could go anywhere, I’d say New Zealand. Also Alaska to see the glaciers before they’re gone! I’ve been there once, but my wife Stephanie hasn’t, and I think my son would appreciate it.

If you could be something besides a neuroscientist, what would you be?
A nature photographer.

Do you have any advice for the rising second year class as they finish rotations and start thinking about choosing a thesis advisor?
Follow your heart. You have to choose an area of research you feel really excited about that will motivate you to come into lab and be creative and not get too discouraged. The more excited you are, the more encouraged you’ll be. If you’re looking at graduate school as a source of training, take it seriously. Find a lab that uses techniques that you want to learn. Emory provides a variety of techniques from molecular to behavioral and computational. Don’t be limited though, in how you think about your project by only the techniques you have immediately available in the lab. Learn how to think outside the box.
Some of the most interesting questions in neuropharmacology concern drugs of abuse, how they act, why people take them, and why people find it hard to stop taking them. With some exceptions, drugs of abuse are illegal, or “controlled”, substances. So how does one go about obtaining these chemicals for laboratory research? Are they grown in that greenhouse on the roof of the parking deck? Are they synthesized in a trailer behind the DUC? Are they purchased on a street corner downtown? The U.S. government has a system of drug classification known as the “Schedule of Controlled Substances”, which consists of 5 levels. Inclusion in the schedule and level assignment is based loosely on severity of effects, medicinal value, and addictive properties, although most aspects of this ranking system are commonly debated. Some of these drugs are often prescribed clinically (for example, Valium) while others are used recreationally in the vast majority of cases (for example, cocaine).

To purchase controlled substances for laboratory research, a DEA license is required. This license must be faxed along with a special form to the distributor when ordering drugs for your lab. Most controlled substances can be obtained from drug companies such as Sigma. The DEA performs on-site inspections, usually every year or two, during which security procedures and usage records are assessed. The DEA also comes to Emory once or twice a year to collect and dispose of any unused controlled substances that have expired.

Controlled drugs must be stored in a locked drawer, cabinet, or safe when not in use. After weighing out drug to be used in an experiment, this amount must be logged along with the lot number on the drug vial, the date, and the specific experiment that the drug is to be used for. A separate log must be kept for each controlled substance used in the lab. All experiments where controlled substances are administered to animals must be approved by the Emory University Institutional Animal Care and Use Committee.

To maintain personal safety, follow all instructions listed on the vial and keep Material Safety Data Sheets for each substance on file in the lab. Wear appropriate personal protective equipment when handling controlled substances. This equipment is often listed on the drug vial. When administering the drug to animals, if an accident occurs such as a needle stick during injection, file a report with the Emory Environmental Health and Safety Office and follow their recommendations for treatment and monitoring of the injury.

**Human Studies,**

Amy Anderson

Human subjects are often useful in neuroscience research so that scientists can explore areas of interest that are uniquely human, such as cognition, psychological issues, complex interpersonal relationships and specific complex disease states. In such cases, an animal model may not exist or may not give us enough information, making human research necessary. Research in humans may also be the last step in a long line of translational research, which often begins in animals and ends with clinical drug trials in human subjects. In addition, human subjects can also be used in fMRI studies, observational studies, historical interviews, cognition and memory tests, longitudinal development studies (infant and child research), etc. Although using human subjects is crucial to the progress of medicine, science and sociology, certain rules must be followed to protect human participants.

**THE GOLDEN RULE: Minimal Risk and Maximal Benefit**

Each study must justify the use of human subjects by balancing the risk to the subjects and the benefits to society as a whole. Studies must always strive to minimize the risk to each participant. This can be done in the following ways:

1. **Getting Consent:** Ensure that the participant is a volunteer and is not coerced into participating in any way. Also, the subject must understand that she or he has to the right to leave at any time.
2. **Ensuring Privacy:** Any information gathered on human subjects must be kept confidential and measures must be taken to make sure information is properly stored and de-identified.
3. **Health Dangers:** Any health dangers must be minimized. If any dangers exist, the participant must be informed of them before they consent to participate.
4. **Emotional Damage:** Researchers must ensure that participation in the study does not cause emotional damage such as fear of certain stimuli, guilt over actions performed during the study, or negative memories associated with the study. These feelings can normally be combated by thoroughly explaining the study to the subject and giving them full disclosure about the study after their participation.

(Continued on page 6)
Philosopher’s Corner: Am I awake yet?
Meera Modi, Pursuer of Wisdom

Buzz. Buzz. Buzz. Groggily open your eyes. Stumble out of bed. Brush your teeth. Get dressed. Step out of your front door. Only to realize you forgot to put on your pants. And there you are standing in your undies on your front step with a bus stop full of giggling grade-schoolers across the street. BUZZ. BUZZ. BUZZ. You wake up, fully clothed in your own bed. It was only a dream. Most people are unable to differentiate a dream world from the physical world while dreaming. It is striking that often the only way to determine that a given set of experiences are in fact a dream is to wake up. Following this logic, one wonders if one was never to wake up, would you ever know that the preceding experiences were only a dream? This dilemma has led philosophers throughout time to postulate that given our perception of the world is the same in dreams and in reality at the moment we perceive them, we may always be dreaming.

Philosophers from Plato to Aristotle to the Eastern philosopher Zhuangzi and Rene Descartes all have in some formed proposed the “Dream Hypothesis”: that there is uncertainty in trusting our senses to distinguish between the dream state and the awake state and consequently we can never be certain of which state we exist. Descartes believed that this doubt came from two observations. One, that everything he sensed while awake he believed he could also sense while dreaming. And since he knew that his dream senses were not activated by external stimuli, there was no way to be certain that his wakeful were aroused any differently. And two, if he could not truly account for his origin, there is no way to determine in which realm he actually existed.

In lieu philosophers of modern psychologists have tried to directly investigate the differences between the cognitive dream state and the cognitive awake state. A systematic assessment of the cognitive, metacognitive and emotional qualities of recent waking and dreaming episodes concluded that qualitatively the two experiences are very similar. Dreams contain the same higher-order cognition as awake experiences, such as attentional processes, internal commentary and public self-consciousness. However the two states differed in recollections of choice, event-related self-reflection and affect.

(Continued on page 6)

Things you didn’t know you could do with a doctorate
Erin Hect, Field Reporter

We’ve all heard Yoland say that getting a Ph.D. teaches you about more than just science. But just in case the whole academia thing falls through, here are some notable things that famous doctorates have done. Not all are recommended.

Be a rock star. Greg Graffin, lead singer of Bad Religion, got a Ph.D. in Zoology from Cornell University. His dissertation title: "Monism, Atheism and the Naturalist Worldview: Perspectives from Evolutionary Biology." And Dexter Holland, lead singer of The Offspring, almost got a Ph.D. in Molecular Biology from the University of Southern California, but dropped out to be a rock star. On the other hand, Brian May, guitarist and songwriter of Queen, went from being a rock star to a Ph.D. in Astrophysics – he finished his from Imperial College London after the band broke up.

… or a sports star. Socrates, the famous Brazilian football (soccer) player, has a Ph.D. in Philosophy and an M.D. from the Faculdade de Medicina de Ribeirão Preto, which he earned while being a professional athlete. And Jenny Mascaro, a current Anthropology Ph.D. student in Jim Rilling’s lab, played professional soccer for the San Diego Spirit before getting into fMRI.

… or a porn star. Annie Sprinkle, who has appeared in over 200 films, has a Ph.D. in Human Sexuality from the Institute for Advanced Study of Human Sexuality in San Francisco. Oh, the things you can learn with Google.

Lead a country. Woodrow Wilson is the only U.S. president to have earned a doctorate; he got his Ph.D. in History and Political Science from Johns Hopkins University. Condoleezza Rice, the U.S. Secretary of State, has a Ph.D. in Political Science from the University of Colorado. And Che Guevara, the Latin American revolutionary leader, had an M.D. from the University of Buenos Aires.

… or blow it up. Ted Kaczynski had an PhD in mathematics from the University of Michigan. He had an NSF fellowship, and his dissertation on geometric function theory, which won an award of distinction, is available through Google Scholar. He quit a professorship at UC Berkeley to retreat to the woods and become the Unabomber.

Prove you’re more than a pretty face. Mayim Bialik, star of the 90’s TV show Blossom, is currently doing her Ph.D. in Neuroscience at UCLA. Her dissertation is on Prader-Willi syndrome. And if you don’t have a pretty face, there’s always radio: Tom Magliozzi of Car Talk on NPR has a Ph.D. in Chemical Engineering from Boston University. Bringing down the Ph.D. coolness factor, our own Santiago Archila appeared in the Hulk Hogan movie Thunder in Paradise, Problem Child 2, and more recently on the David Letterman Show (where he neglected to mention neuroscience).
Radiation didn’t give me super powers: Continued...

(Continued from page 4)

**Autoradiography.**

A specific ligand for a receptor is labeled with a radioactive element, generally $^3$H (tritium) or $^{125}$I. The ligand binds to its receptor and the incorporated radioactive molecule emits ionizing radiation (usually $\beta$ particles). These particles interact with the emulsion of photographic film, resulting in an image reflecting the receptor distribution profile. A similar technique is in situ hybridization, in which mRNA distribution is determined instead of receptor distribution. Complementary radiolabeled oligonucleotides are used as ligands to assess mRNA concentrations and even their locations within the cell. Through this technique, experimenters can gain knowledge of cellular protein synthesis and concentrations of receptors with nonspecific ligands.

List of Safety Concerns:
1. Be Neat: Keep all radioactive material (including all the labware) confined to one specific area that is labeled as a radioactive work zone.
2. Be Aware: On the flip side, be aware of what you are doing in a radioactive work zone. Do not eat in or allow street clothes to come in contact with the radioactive area, as they can easily become contaminated and allow for the transfer of radioactive material outside of the lab. Also, remember that you can’t feel, smell, or taste radiation, so it’s important to keep that desk at which you eat your Hot Pockets free of $^{125}$I hot packets.
3. Be Conscientious: Dispose of all radioactive waste properly and account for all radioactive material, whether it was used in an experiment or transferred to a waste container. Do not share radioactive material between labs, no matter how much you like (or dislike) them, as this allows radioactivity to potentially become lost or unaccounted for.

Philosopher’s Corner: Continued...

(Continued from page 5)

For further reading:
Descartes, Rene “Meditations on First Philosophy (Meditation Six)”


4. Be Skeptical: Despite what you may hear from a certain subpopulation of fourth years, keep in mind that: it is not that cool, Ron Calabrese hasn’t done it and it won’t help you pass quals!
5. Don’t mouth Pipet!!!
“Religion and Science” sub-section of the “Religions and the Human Spirit” Strategic Initiative of Emory University. Some of my projects will facilitate science and society dialogues and public outreach on divisive issues facing our society today, such as stem cell research, evolution and genetic engineering; issues which mark the overlap and interplay between scientific pursuits and religious tradition. Emory is uniquely positioned to explore this interplay given the rich resources and excellence in research and teaching in many of these areas.

This is an extremely unconventional career opportunity and I am thrilled to have found a post doctoral training fellowship which will allow me to integrate my varied interests in a way that will utilize my scientific research background with my teaching and curriculum development experience.

Kelly Allers, PhD, 1997
Senior Principal Scientist, Pfizer Global
Former Advisor: David Rye and Jorge Juncos

From Emory, I moved on to the National Institute of Neurological Disorders and Stroke to take up a post-doctoral position with Judie Walters, investigating the neurophysiology of basal ganglia circuits. In 2000, I changed fields and countries to take up a further post-doctoral position with Trevor Sharp in the Department of Pharmacology of Oxford University in the United Kingdom. In Dr. Sharp’s group, the focus of investigation is on the dorsal raphe serotonergic system and its role in mood disorders. Within this group I carried out electrophysiological studies to investigate interactions between neuronal subtypes within the dorsal raphe.

My current position is as a Senior Principal Scientist within the Genitourinary Therapeutic Area at Pfizer Global Research and Development. In this role I am responsible for running an electrophysiology group that is primarily involved in exploring the pharmacology and circuitry involved in female sexual function and in bladder sensation. In addition, we develop physiological animal models to assess efficacy and pharmacology of novel compounds for treatment of female sexual dysfunction and overactive bladder. In this position I am also responsible for communicating our science externally, making decisions on utility of various animal models, and developing the scientific strategy for our product concepts.

The move from academia to industry was more serendipitous than planned - the position opened as my Oxford post-doc ended and I knew several people who had taken up positions at the Pfizer UK site. Upon interviewing, I realized that the quality of the science in industry, the speed with which things get done, and the focus on treatment of patients were all things that I desired in a permanent position. There are downsides to working in industry - the pressure is high to achieve something useful, your role/group/title/focus of research can change quickly and often; your allocated resources are tied to the share price/productivity of your department/success in clinical trials or FDA approval. Scientists are not able to focus on one important question - you must be able to learn a lot very quickly and do a lot simultaneously: in four years at Pfizer my team has investigated 32 compounds targeting 18 different neurotransmitter receptors and have developed physiological animal models for premature ejaculation, female sexual arousal, and bladder sensation, in addition to doing studies aimed at investigating the role of hypothalamic nuclei on apomorphine induced sexual arousal. A further downside is that only about 1/4 of this work will be publishable due to confidentiality constraints. I would recommend to anyone curious about industry to take up a post-doctoral position with a pharmaceutical company. These tend not to come with benefits or salary of a permanent position - but would certainly provide an overall view of what the atmosphere is like and if you are suited to industrial science. I would also highly recommend expanding the job search to include Europe - where 25-30 days holiday per year are not only standard but you are STRONGLY encouraged to use them. Time off combined with the ability to get anywhere in Europe within a few hours is a great combination.

My supervisors have had a huge influence on who I am today. David Rye taught me more about being a scientist than any other single person I've encountered. He taught me how to focus my questions, how to interpret results accurately, and how to strive towards doing the best science possible. To this day I amuse my team with Dave-isms and stories of my grad school days in Dave's lab. Jorge Juncos is packed full of ideas and enthusiasm and kept me motivated when things were tough. Jorge is always willing to introduce students to more senior scientists as he truly cares about their welfare. From Jorge I learned how to nurture my team and keep them happy. I left Emory with a Ph.D. in Neuroscience but more importantly, I left with the actual skills to be a scientist - and the enthusiasm that can only be generated in a place where people love what they are doing and do it exceptionally well!
The Printables...
Vasiliki Michopolous and Charity Duran, Comic Specialists

ACROSS
3 Used to deliver an injection
5 Ridiculously expensive string necessary for stitches
6 Flushing this is a must if repeated access to the vascular system
9 Holds a skull in place and provides coordinates
12 This type of microscopy takes the prettiest pictures
15 Creates a current to separate based on size
17 Use one of these plug into a cell
19 Don't do this by mouth
20 A way to quantify ribonucleic acids
21 Use me if you have strong desire to cut and lose feeling in your fingers

DOWN
1 A 4 tesla one of these is pretty impressive
2 Keeps your cells warm happy
4 Spins spins spins
7 Uses hot stuff to look for stuff
8 Pretty, elegant. tracings?
10 A way to quantify deoxyribonucleic acids
11 Necessary to measure something like 1-125
13 A spotted miniature potato crisp
14 An old movie or a way to quantify protein levels
16 Keepers of significant things that cannot be recovered
18 Spoiled milk memory test
19 Please. copy. reality.

..and that’s why I love patching HEK cells. They don’t bite, they don’t fling poo at you—basically they don’t do or feel anything so it doesn’t matter what I do to them.

Man Frank…I don’t know what they put in the media but I feel horrible.

At least you aren’t glowing green.

The End
Charity
Co-Editors:
Amy Mahan
Alex Poplawsky

...never lacks brains.

Famous Graduate Students

Last fall two of our neuroscience graduate students, Adam Orr and Anna Goldshmidt were married on the beach in the Outer Banks of North Carolina (Duck, NC more specifically) on 10/4/07. This photo was taken by their photographer, Chris Bickford, right after the ceremony. It was one of his favorites so he sent it in to be included in the bridal magazine and they just happened to select if for the cover!

Events in Atlanta

SCREEN ON THE GREEN (CENTENIAL PARK, 6PM, FREE!!)

- May 29—Jaws
- June 5—Big Mamma’s House
- June 12—Chicago
- June 19—E.T. the Extra-Terrestrial
- June 26—Footloose

CORNDOGORAMA 2008: THE YEAR OF THE MUSTARD KING

June 26-29 Celebration of independent arts, music and deep-fried tube steak. Four-day lineup features everyone from Zoroaster, James Hall, Noot d’ Noot, Dan Deacon, Janelle Monae, Proton, Snowden and the Georgia Satellites spread out over four indoor and outdoor stages. $50 four-day pass, $20 daily. Lenny’s. 486 Decatur St

CREATIVE LOAFING BEERFEST 2008

Beer’lympics, Woodruff Park,
Saturday June 12 2pm-7pm

The Emory Neuroscience Graduate Program leads to the Ph.D. degree and is designed to provide a broad background in modern neuroscience, as well as specialized training in a wide range of specific research areas and techniques. The particular areas of strength in our program are further described on our website. The broad range of research interests coupled with a collaborative atmosphere make the Emory Neuroscience Program well suited to provide a strong, dynamic and exciting environment in which to pursue graduate studies.

For more information please check out:
www.emory.edu/NEUROSCIENCE

or

Contact Sonia Hayden at shayden@emory.edu or (404) 727-3707.

For comments on this newsletter please contact Amy Mahan at amahan@emory.edu.