The Restriction Digest

G.S.A. Newsletter

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GSA Notes

By Krishna Juluri
GSA President

As the year rapidly comes to a close, I would like to recap our most recent events and update you on the events that will close out the year. In April we had our Pioneers in Science lecture by Dr. James Rothman, who gave one of the best Pioneers lectures to date, on topics related to vesicle fusion. In the last week of April, we celebrated National Graduate Student Appreciation week by hosting a number of exciting events throughout the week, cosponsored by the Johns Hopkins Medical and Surgical Association. This included a movie night with movie theater-style popcorn and candy and the movie, "The Italian Job." Look for the return of this popular event in the near future. In addition, we had a pizza lunch and ice cream social, as well as beer tasting at the Kiss Café, featuring a live jazz band and free French Canadian beer provided by Unibroue. In early May we had our most ambitious event yet, a whitewater rafting trip to the Lower Youghegeny River. About 90 graduate students and their guests braved the class III/IV rapids in Pennsylvania. Based on the overwhelming demand for this large outdoor event, we plan to have something of this nature again in the upcoming year.

We will be closing out the year with a few fun filled events. First up will be the 8th Annual GSA Poster Session and Happy Hour on Thursday, May 27th in the PCTB Greenhouse. Come out and see a sampling of the great research

Continued on page 5

Commencement Speech

By Emily Overholser, PhD

Four score and seven years ago, my fellow graduates and I entered graduate school at Johns Hopkins University (at least it seems that way). Unbeknownst to us as lowly unsuspecting first year students, great peril and difficulty lay ahead.

I often wonder if non-scientists who've never done a PhD in the basic sciences ever fully grasp the reality of obtaining the degree of Doctor of Philosophy from a high-powered institution such as Johns Hopkins. Do they think that graduate school is like what we see scientists doing on TV, drawing brilliant conclusions from boiling colored liquids, splicing genes together to create Super Sharks that go on to terrorize the world, or solving crimes by performing Southern Blots in one hour with the help of a "blazing-hot probe." Or perhaps as graduate students, they think we sleep in every morning until 11:30am, saunter into lab by 1pm to drink free lab coffee, sleep through lab meeting from 2-3, and then leave lab to go home and start a new batch of homemade beer.

I will tell you the sad reality- a typical day is spent hustling between your desk, lab bench, and tissue culture room, performing three experiments at once, all of which are on three different time schedules but somehow always manage to overlap. Since no one has perfected human cloning yet, one experiment inevitably gets neglected: incubations run over, tubes

Continued on page 3

It's good to be King: An interview with teacher-of-the-year King-Wai Yau

By CMM correspondent Daniel Gorelick

Each year, graduate students in the School of Medicine vote for their favorite teacher. This year's winner is a short, wiry Hong Kong native in the Department of Neuroscience whose name reads like royalty: King-Wai Yau.

King-Wai (or King, for short) originally enrolled in medical school in Hong Kong, but was turned off by dissecting a human cadaver. He left in March, 1968, and eventually went to Princeton, where he graduated with a bachelor's degree in physics.

King was then accepted into Harvard's biophysics graduate program. On a pre-matriculation visit, however, he noticed the burgeoning Neurobiology Department, the first of its kind in the US. Harvard had recently recruited the acclaimed physiologist Steven Kuffler (formerly

Continued on page 2

UPCOMING GSA EVENTS

Thursday, May 27, 2004
GSA Poster Session
PCTB Greenhouse Cafe

Wednesday, June 2, 2004
End of the Year Cookout
3-6 pm
PCTB Courtyard

Friday, June 4, 2004
Teacher of the Year Lecture:
Dr. King Wai Yau
3-4 pm
West Lecture Hall

Teacher of the Year, Continued from page 1

at Hopkins) to set up this new department. Kuffler brought his post-docs, two of whom (David Hubel and Torsten Wiesel) eventually won the Nobel Prize. It was an exciting locale for neurobiology, and King wanted to be a part of it. But in order to work with somebody in that department, he had to leave the Biophysics Program. So he gave up his biophysics scholarship and joined John Nicholls' lab in the Department of Neurobiology. Nicholls was one of only a handful of students of Sir Bernard Katz, who won the Nobel Prize in 1970 for discovering the mechanism of synaptic release. Two years after King entered Harvard, Nicholls moved to Stanford. King described it as "the best of both worlds. I worked at Stanford and got a Harvard degree."

King's first two publications were solo-author papers in the Journal of Physiology. Today this seems miraculous, but 30 years ago this was common practice among electrophysiologists. King admitted that if he were in a biochemistry department, this probably would not have happened. "In certain schools of electrophysiology, this was the way. Labs contained few post-docs and even fewer students. And PIs rarely put their names on students' publications, unless they worked side-by-side. It was just the way of the culture. In those days people had one-track minds and PIs performed their own experiments. Those days are gone. I don't do that in my lab. Science is totally different now than it used to be. It's more competitive now. In those days, it was almost like a hobby (even though we worked equally hard as we do today)."

Or as David Hubel put it, "One then had little of the feeling of frenetic competition that is found in graduate students today; it was possible to take more long-shots without becoming panic stricken if things didn't work out brilliantly in the first few months."

After graduating, King thought about returning to Harvard to work on the visual system with Hubel and Wiesel. Nicholls suggested working for the best scientist, regardless of the subject. King chose Denis Baylor, one of Nicholls' former post-docs, who happened to run the lab next door.

So King spent the next few years with Baylor and they became best friends. Perhaps another sign of a passing age: how many post-docs are best friends with their mentors? He got a faculty position at the University of Texas Medical Branch at Galveston ("I wanted to avoid the limelight"), but delayed taking the job, on the advice of Baylor, in order to work for the grandfather of all electrophysiologists: Sir Alan Lloyd Hodgkin (Nobel Prize 1963).

When King joined the Hodgkin lab, there were 4 other post-docs working on two projects—and no students. King recalls that the first year he was there, Hodgkin wasn't even doing science—he was the Master of Trinity College, Cambridge (appointed by Queen Elizabeth on the advice of the Prime Minister). "Two post-docs worked together on one project, using one electrophysiology set-up, and the other two worked together on a second project using another set-up. I joined one of the projects, and spoke to Hodgkin maybe 4 or 5 times that year."

After a year, King and his family decided to move on, when Hodgkin suddenly approached King and asked if they could work together. King's family left England while King remained and for one year, 6 days a week, worked side by side with Hodgkin. King spent 4 hours every morning making solutions. In the afternoon he and Hodgkin would make electrophysiological recordings. Then they would often go to Hodgkin's house for dinner, where his wife was waiting for them. Sometimes they would work until 9 or 10 at night. For Hodgkin, devotion to science was all or nothing. It was an experience that influenced King's way of doing science. "I couldn't pick up his IQ, but I tried to pick up some of his good habits. It's already good enough to benefit me for a lifetime."

Between Kuffler, Nicholls, Baylor, and Hodgkin, King comes from a very strong scientific dynasty. He is obviously proud of imbuing members of his lab with those values that his mentors cherished. But times have changed, and King can neither afford to spend all of his time on one project, nor can he invite the 13 members of his lab over for dinner every night. Like Hodgkin and Baylor, King likes to function behind the curtain. He gives few talks, attends few meetings, and serves on no editorial boards. He is admittedly not an ambassador for science. "I'm not sure I'm good at it."

After a post-doc with Hodgkin, King joined the faculty of the University of Texas Medical Branch at Galveston in 1981. Within four years he rose to full professor. In his five years on the faculty there, he never gave a lecture or mentored a student. "They never asked me to give a lecture, and I never volunteered."

He moved to Hopkins in 1986, but didn't give his first lecture until 1988. In 1991, with great reluctance, he finally agreed to mentor a student. That was Ravinder Dhallan, MD-PhD, now CEO of Ravgen in Columbia, MD. "Ravinder approached me, and I told him I wasn't taking a student. But he was very persistent, he came to me several times, and I took him. He was outstanding. Now I'm up to my 9th student, and every one has been outstanding. Students are the best thing that has happened to me. I've found great joy in working with students. It's like a great discovery."

Why did it take so long for King to discover students? Part of it is the culture he trained in, where eminent scientists like Baylor and Hodgkin had less than half a dozen students throughout their careers. Part is due to personality. "I'm kind of an awkward person in public," King describes. "I do better in one-on-one situations. I'm better now but I was a late starter. It took me a long time."

These days King teaches the first-year neuroscience students electrophysiology. Every year he lectures on action potentials and how ion-channel activity is measured, and modestly refrains from mentioning the close association he had with the pioneers in these fields. The self-effacing King is still amazed that he won this award. "There could be two reasons why I won," he speculated, "a mistake in the counting, or the students are putting me on a pedestal to shame me into improving."

Pictures of the late Hodgkin and Kuffler hang prominently in King's cluttered office. No doubt they are proud of their King.

The most unusual aspect of King is his name. King is an English version of a Cantonese word that means scenery. It's pronounced gayng (using a soft ng sound and a rising tone of inflection). In mandarin this word is jing (with a falling then rising tone of inflection). Wai (pronounced like *way*) means glory. When he moved to the US, he decided to keep his Chinese name and not adopt an American alias. "Wai is difficult to pronounce: way, why, wow, nobody can say it properly. So I just use King. I have 2 brothers named King-Fai and King-Chiu. King-Fai is in Canada, and everybody calls him King. I hate the connotation, but it's too late."

Surprisingly, nobody has given him much trouble over his name, usually because it's mispronounced or spelled incorrectly. "I have about twenty names: Kang, Kin, Kong…"

I told King that if he were in our lab, we would definitely make fun of his name.

"Don't worry," he replied, "it's still funny."

Commencement Speech, Continued from page 1

get switched, and when the drum-roll pounds and its time to look at your results, you find that your results are the exact opposite from the last time you did the experiment. The worst part is when you actually do settle down and do an experiment correctly in excruciating detail, expecting to get that perfect blot or exposure for publication, the cruel science gods laugh at you, work their voodoo magic, and somehow change the laws of nature to dash your hopes to bits once again. Fortunately for us, the "pain and torture" seems to come to an end about three years into this experience we call graduate school, you reach a pinnacle of creativity, hard work, and just plain desperation, and a miracle occurs. Finally, one experiment actually works.

From then on, you're a scientist! You see a small pin prick of light at the end of the tunnel that is your dissertation, and your boss begins to say things like, "Good job," or "Maybe its time you start writing this up." You get rotation students to do the boring cloning that you've been putting off and not wanting to do. You get published. YOUR NAME IN LIGHTS!! Ok, so maybe your paper ended up in a journal called "Gut". But there's always more work to be done, more questions to ask, more experiments to plan and do. Ultimately, your boss and thesis committee say the magic words: You're finished! Your parents are thrilled because after 4 years of college and 6 years of grad school, you can finally get a REAL, high paying job, with lots of benefits and retirement savings!!! But how do you break it to your parents that you're officially addicted to science and will be moving on from graduate school to bring in a whopping $36000 a year in a post-doctoral position?

In the end, when it comes down to it, despite all the hardships of graduate school you come to love the thrill of finishing experiments that solidly prove your hypothesis, the creative freedom you have to design and plan your own experiments, and waking up at 3am with an epiphany as to how to proceed with your project. I wish to congratulate all of the graduates in this years' class. I think that, after going through the learning process that is graduate school together, we have become not only friends but colleagues. I wish all of you the best of luck in all of your future endeavors wherever they may take you.

SAP CORNER

Effectively Managing Your Anger: It's the Thought that Counts!

Deborah Hillard, Psy.D.
Student Assistance Program

Many of us confront frustrating situations on a daily basis. For example, you might be driving on the highway and someone cuts you off or maybe your neighbor keeps blocking your driveway with his garbage can. Whatever it is that makes you angry, it is important to keep in mind that anger is a common emotion that occurs daily.
Anger is an appropriate response when used constructively, that is, when our needs are asserted in a non-aggressive manner. There are several common myths about anger including:

Anger is bad	Anger is dangerous
Nice people don't get angry	Anger is uncontrollable
Angry people are hurtful	Anger is unladylike

Nothing is wrong with occasional, moderate anger but chronic, sustained anger can negatively impact your physical and mental health, your relationships with family and friends, and your career. For example, chronically angry people are more likely to have cardiovascular disease, feel isolated from others, and have more school and work-related problems.

Learning how to manage anger more effectively begins with an honest self-assessment. First, it is important to identify triggers. Ask yourself, "What types of situations usually make me angry?" Begin to notice when you are getting angry and look for common themes. Next, remember that you can't change anyone but yourself. Take responsibility for your anger because in reality your response is completely under your control. Try to remove yourself from the mindset that you can change someone else's behavior. I am willing to bet you have already tried this tactic with little success. Finally, remember that making a positive change comes with hard work and practice. There aren't any shortcuts.

Instead of blaming others for your anger, let me challenge you to think about anger differently. Instead of believing that a certain situation caused you to become angry try to think of anger as the result of what you are telling yourself about the situation. So, it is your interpretation of the situation rather than the situation itself that causes you to feel angry, upset, depressed, frustrated, and/or annoyed. The interpretation of the event or the thoughts you experience during a specific situation set off a chain of events and eventually you experience an emotion. Let's look at this process in more detail using a common anger-producing situation: Locking your keys in the car.

1. EVENT: **Something happens - this can be an actual event, a memory, or a visual cue, eg. keys are locked in the car.**

2. THOUGHT**: Once an event happens, a thought emerges and a situation is interpreted. Pay attention to your "self-talk." When feeling vulnerable, it is not uncommon for our thought process to be skewed, non-rational and thus, we are more apt to make gross generalization based on biased information. Here you might say to yourself, "Now I am going to be late for school and I'm going to miss an important lecture...now I am never going to pass the final exam!"**

3. CHEMICAL: **The brain responds to this thought by signaling the body to produce a chemical such as adrenaline or cortisol. For instance, increased levels of cortisol lead to increased feelings of anxiety.**

4. EMOTION: **The released chemical creates a physiological sensation, which the individual interprets as a particular feeling, including anger.**

5. BEHAVIOR: **The person then chooses a behavior among the variety of behaviors available. Many factors determine what behavioral choices a person makes, including past experience and imitation. This might include yelling, crying, hitting something or conversely, more passive aggressive types of behavior such as silence.**

6. REACTION: **The behavior a person chooses affects the other people who are present, who react in turn. The reaction brings forth another event, and the circle continues.**

By adopting more positive ways of viewing a situation and searching for solutions to problems, angry feelings should decline. Some common "thought" traps include thinking about the worst-case scenario, blaming others, overgeneralizing, and seeing things on polar extremes. Be sure to seek appropriate assistance should you find that you are having trouble managing your anger, especially in instances of physical anger. For more information about this topic, please feel free to contact the Student Assistance Program (SAP) at (410) 955-1220 or visit our website at www.jhu.edu/sap.

Restaurant Review
By Jaime Cheah

City Café, 1001 Cathedral St., Baltimore
(Corner of Cathedral and Eager)
410-539-4252
Hours: Monday-Thursday: 7:30 a.m-11 p.m.
Friday: 7:30 a.m.-midnight
Saturday: 9 a.m.-midnight
Sunday: 9 a.m.-11 p.m

When I think about weekend brunch, several requirements come to mind: excellent food, great atmosphere and good company. It was the latter that brought me to the former – two years ago, friends introduced me to a trendy eatery, City Café, located in the heart of Mount Vernon, at the corner of Cathedral and Eager. Its two level dining room, ceiling glass windows and black and white checkered floors hint at a little piece of Manhattan here in Baltimore.

Started in 1994 by Gino Cardinale and Bruce Brodie, in a space that used to be a car dealership, City Café offers breakfast, lunch and dinner at inexpensive fares ($8 - $17 for entrees). The entrance on Eager Street leads you into the main two-tiered dining room. The Cathedral Street entrance leads you to a full-service counter and a case of home-made desserts. Though all of their meal offerings are great and their desserts delectable (I have sworn off ever making carrot cake again because theirs is so good), it is their weekend brunch that makes me a City Café regular.

One recent Saturday, armed with a recently converted City Café regular and a newcomer, I went to City Café with a mad craving for pancakes. Since it was a beautiful day outside, we chose to sit in the bright sunshine and enjoy our morning cups of strong coffee. City Café has a standard weekend brunch menu, with specials changing every week. As an added perk, they offer both mimosas (orange juice and champagne) and Bloody Mary's as starting drinks. How can you not love a place like that?

My favorites on the menu, besides their banana pancakes, are their Belgian Waffles and Breakfast Burrito. Since there were three of us, we ordered one of each. And what is breakfast without hash browns?? The banana pancakes were delicious – crispy on the edges and soft in the middle, where the bananas were mixed in pieces into the pancake, served with butter and maple syrup – good enough to make my Canadian friend proud – on the side. My newcomer friend had the Belgian waffle, which was also excellent with the correct texture and consistency, topped with a *ménage a trois* of fruit – strawberries, blueberries and bananas. Both sweet servings, though deceivingly small in appearance, were quite filling, leaving us with just enough room to fill with the yummy, crispy, hot hash browns. For my other brunch buddy with the largest appetite, the large-sized Breakfast Burrito did justice in fulfilling his stomach's needs. A *mélange* of scrambled eggs and pepperjack cheese, wrapped in a tortilla, served with salsa and guacamole on the side, fulfilled his taste needs.

Besides the normal brunch menu, some of the specials they offer are also quite good. When diverging from my favorites, I tend to order their Baltimore Benedict – City Café's take on the traditional Eggs Benedict. Replacing the black forest ham over poached eggs is large lumps of backfin crab meat. If you're not in the mood for breakfast items, they also offer lunch items, such as burgers, salads and sandwiches.

What I love most about City Café is their great atmosphere. Having brunch there is like watching a scene from *Sex and the City* – good friends sitting around a table, with music surrounding us, sharing food and drinks, laughing and gossiping about life. Whether you taking someone on a first time date, meeting friends for drinks or gathering with your family, City Café is an ideal place to relax and have fun.

Brunch for three including coffee, OJ and tip: $45

GSA notes, Continued from page 1

done by your fellow students and enjoy free food and beer. On Wednesday, June 2nd, we will celebrate the end of the year with an old fashioned cookout. Join us in the PCTB Restriction Courtyard from 3-6PM, as we grill up hamburgers, hot dogs, chicken, veggie burgers and other great food. On Friday June 4th, join us in honoring Dr. King-Wai Yau who you chose as the recipient of the 2004 GSA Teacher of the Year Award. King will give a lecture on "what he has learned over the years as a scientist." The lecture will be followed by a Happy Hour in his honor in the student lounge.

I would also like to introduce our new GSA officers for the next year. Andrew Watkins and I will be continuing our current positions as co-VP and president, respectively. We would like to welcome Lefei Sun as co-VP, Elizabeth Reichl as treasurer, and Kristina Krasnov as secretary. We have a number of exciting changes and plans for the upcoming year, including more outdoor activities, large combined events with the medical students, and Homewood graduate students, community service events, and a variety of others. I encourage everyone, especially the first and second years, to participate in our upcoming events and meetings.

Faculty Profile: Stuart Ray, M.D.

Associate Professor, Department of Medicine,
Division of Infectious Disease
By Daphne Monie

Stuart Ray is brilliant. He seems to know something about everything and everything about some things. He has been known to rattle off interesting but seemingly random facts on a wide array of topics. He is well respected in his chosen field, the study and treatment of RNA viruses, specifically Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV). However, it is his expertise in bioinformatics, the application of computer science to biology, which leaves people in awe. Stuart's intelligence and his height, which is well over six feet, make him more than a little intimidating. Don't be fooled, however, Stuart is also one of the nicest people you are likely to meet.

So how does someone get to be so smart and so talented in his or her chosen occupation? Stuart's story starts with his discovery of his passion for computers. Stuart's public high school in Nashville, Tennessee had an IBM 3070 on which he did his first programming using punch cards. As personal computers became available, he managed to convince his parents to purchase one for him. "It was a tough sell," he laughs. Stuart's father worked as a Presbyterian minister at Vanderbilt University and his mother, who had stayed at home, was just starting a career in real estate sales, so money was tight. Stuart's persistence paid off, however, and he became the proud owner of a 4 megahertz AT&T 6300 personal computer

Despite his love of computers, Stuart received only one semester of formal training in computer science at the California Institute of Technology where he began his undergraduate training. He instead focused his studies on physics. After two years of pulling regular all-nighters on physics and mathematics problem sets, however, Stuart began to feel that his learning curve and social life had reached a plateau. Stuart's interests had also begun to shift from physics to the biological sciences. So, he transferred to Vanderbilt University for his final two years where he majored in molecular biology. Vanderbilt also gave him the opportunity to grow outside of his main academic interests and provided a more well-rounded and enriching experience.

It was also as an undergraduate at Vanderbilt that he became interested in research. Stuart had worked in a laboratory as a high school student where he says he "washed glassware and learned how to pipet." As an undergraduate at Vanderbilt, he found himself washing glassware again in the lab of Douglas Cavener. This time, he had the added responsibility of the care of the laboratory's fruit flies. It was not long, however, until Cavener discovered Stuart's talent for writing software. Cavener enlisted Stuart on a project to write a program that taught undergraduate students methods for analyzing genetic sequences. This was Stuart's first exposure to bioinformatics.

Stuart's exploration into the wonderful world of phylogeny, the study of genetic relationships, did not stop there. While in Cavener's laboratory, he also wrote a program he dubbed Interbas that led to his first and most cited scientific publication. This program was designed to compare sequences surrounding sites in genes where protein translation is started and stopped. By looking at more than 2,500 genes, Interbas was able to identify similarities among many different organisms. These consistent patterns suggested common mechanisms for the initiation and termination of translation in many different organisms.

Stuart remembers his experience in Cavener's lab fondly. "He was a great mentor and a wonderful person. He had a family with kids. It made me realize that science is something real people did." Stuart also realized, however, that he was not passionate about what genes were turned on at what times in a fruit fly. He loved to teach and desired more interaction with people than working in a laboratory provided. As graduation approached, Stuart was set on becoming a high school science teacher. It wasn't until a good friend of his applied to medical school that he began to consider that as a possibility. He realized that as a physician he could continue to study biology while helping and interacting with people. In retrospect, it is shocking to discover that Stuart was rejected by five medical schools and wait-listed at Vanderbilt. He laughingly admits that it is probably a family friend's suggestion that the admissions committee take another look at his application that led to his eventual acceptance. Weeks before matriculation, Stuart finally received the invitation to join the Vanderbilt University School of Medicine Class of 1990.

During medical school at Vanderbilt, Stuart gave research another chance. He joined the laboratory of Carl Hellerqvist that studied carbohydrate structure using mass spectrometry. The lab members were always complaining about squinting at the complicated array of peaks in the analysis of piles of mass spectrometer read-outs. Once again, Stuart's hidden talent was called upon as he offered to write the lab a program to help analyze the peaks. It took years to complete, but the program was a success resulting in a publication and a patent application. Millipore Corporation purchased the patent for $20,000, $2,000 of which filtered down to Stuart. This is the only money he has ever received for any of the software he has developed. Stuart feels that it is this experience that helped him secure the residency program of his choice. "Having my name on a patent application gave me something to talk about at interviews."

Through his research experiences, Stuart discovered that he is fascinated by the concept of entropy. Entropy, the tendency for things to become random and disorganized, is a powerful force in nature. Stuart relates a story of famed oceanographer Jacques Cousteau who was enlisted to help search the bottom of the ocean for shipwrecks. "He just looked for straight lines. There are no straight lines in nature." There is, however, natural order buried in the sea of entropy. "When you find order in nature," Stuart's tone is now serious, "you know it's an important process. I love finding patterns in nature."

Finding these patterns is not as easy as spotting a straight line on the ocean floor. The human mind is not capable of processing the information necessary to detect patterns in the complexity of life. That's why scientists have taken to using computers to sift

through large amounts of data in search of these patterns. Stuart's passion for finding patterns in nature is a good match with his love of computers. Most biologists do not have experience in computer programming, so it is not surprising that Stuart's computer skills have been called upon repeatedly in his laboratory experiences. His computer expertise was never the thing that got him into labs, but it served him well. "I've always tried to do basic bench science, but keep getting drawn into the computer stuff," he says. In his experience, he was drawn towards his strengths in ways he couldn't have predicted. He advises students, "Have something in your toolbox. If you follow your passions, you will be very good at something."

Stuart chose to do his residency at the Johns Hopkins School of Medicine in Baltimore, Maryland for its intense training experience. "People were excited at Hopkins," he says. "Sure, they throw you in the deep end, but they also provide the support to make sure no one drowns. Hopkins has a great reputation for getting an education, but a bad reputation for getting sleep. I like to work hard, and I don't need that much sleep." Stuart and his wife, Sharon, were reluctant to move to Baltimore, but they looked at the city's low cost of living as an advantage for starting a family. "We swore we would only do three years in Baltimore," Stuart recalls, "but we love it now."

After his three-year residency in internal medicine, Stuart stayed at Hopkins for a fellowship in infectious disease. During his fellowship, he sought research that was focused on the needs of the patients he treated. "I wanted to do research that had a short distance from the bench to the bedside." He joined the laboratory of Robert Bollinger to study HIV and was soon involved in the analysis of a huge number of HIV sequences from patients in India. One particular HIV sequence they found looked interesting because it seemed to be a combination of different types of HIV sequences. No software existed to analyze this recombinant sequence, so Stuart wrote his own. He has since made the resulting program, SimPlot, available for free online. SimPlot is probably Stuart's most widely utilized program. It has been used in 160 publications and has over 500 registered users. "Software development is not a funded project, but it is one of the most rewarding. People I've never met before come up to me at meetings to thank me for providing SimPlot free of charge." Many of the scientists that thank him are from poorly funded labs around the world that have no extra money to spend on software.

As Stuart was finishing his fellowship, he began to think about starting up his own laboratory. He loved the field of HIV including the areas being researched and the tools and hypotheses being applied. However, he felt the HIV community was very competitive and closed. "One of my colleagues pointed out that funding for HIV was not expanding, while the number of people studying HIV was," he remembers. Still, he strongly considered sticking with the challenging field of HIV until David Thomas convinced him to study Hepatitis C Virus (HCV) and offered to be his mentor. He was initially skeptical about switching fields, but he came to realize that it made a lot of sense. "There were a lot of people studying the phylogeny of HIV, but not many studying HCV." He also cites personal reasons for the switch to HCV. "I need to feel like I'm studying a disease that's relevant to those around me." In his time in the clinic, Stuart came to realize that HCV infection was a much larger problem in Baltimore than HIV, and fewer people were studying it. It is estimated that 50,000 people in the Baltimore area are infected with HCV out of a total of 170 million people infected worldwide.

After a lot of reading on HCV research, Stuart wrote his first R01 grant application to the National Institutes of Health. The grant was funded, but it still took a long time set up his own laboratory. Since he had stayed at one place, Stuart did not receive any start-up money or lab space at Hopkins. Over the next two years, he had five different offices, some of them shared, and he depended on Thomas for lab space. Stuart was finally given his own office and a 3,000 square foot laboratory that he shares with 5 other faculty members. He credits his three main mentors at Hopkins, Robert Bollinger, David Thomas, and Robert Siliciano, for helping him through the rough transition.

Appointed associate professor in the Department of Medicine in the Division of Infectious Disease in 2003, Stuart now divides his time among the many duties of a clinical researcher. He treats patients in the Hepatitis C clinic and the inpatient AIDS ward. He satisfies his love of teaching as instructor in the immunology classes for medical and graduate students, as a teaching attending physician for the internal medicine wards, and as a regular lecturer to house staff and postdoctoral fellows. He also enjoys training researchers and currently has three graduate students, one postdoctoral fellow, and one technician working in his laboratory.

Most of his time, however, is spent on research. Stuart tries to take a broad view for his research goals. He hopes to be able to understand what comprises an effective immune response against HCV and to determine how to measure these responses in hopes of someday developing a vaccine. He continues to use his computer skills and his love of searching for biological patterns to accomplish these goals. Despite his recently starting his own laboratory, Stuart already has 40 publications to his name, partly due to scientists seeking him out for collaboration. Word of his expertise in bioinformatics has traveled quickly throughout the scientific community, and Stuart's amiable personality makes him approachable by people who are uncomfortable in this field. Stuart is very giving of his time and is an exceptional teacher without ever being condescending to his students or his collaborators.

Stuart sees his biggest challenge as the decision of what direction to take his research. He is constantly struggling with whether to formalize his software development and focus on bioinformatics or to stick with basic research that uses bioinformatics as a tool. Stuart also suffers from a severe case of cultural guilt. He is aware of how fortunate he is to live in a country where he can devote his time to his work without having to worry about health care and other basic necessities. Once his two children, Jocelyn and James, are older, he considers traveling abroad to study and treat diseases in less fortunate countries. For now, though, he is content in Baltimore following in the footsteps of his mentors, inspiring his students, and pursuing his passions.

The Eighth Annual Graduate Student Association Poster Session and Happy Hour

Thursday, May 27, 2004, PCTB Greenhouse Cafe

First and Second Year Submissions

Tamara Flys	"Analysis of PTAP Duplications in the *Gag* p6 Region of Subtype C HIV-1"
Yefei Han	"Latent HIV-1 Genomes Reside in Actively Transcribed Genes in Resting CD4+ T cells *in vivo*"
Eric Lutz	"Induction of Mesothelin-specific CD8+ T-cell Responses in Vaccinated Pancreatic Cancer Patients Provides Evidence of *in vivo* Cross-Priming"
Jason Shepard	"Arc modulates AMPA receptor trafficking via its interaction with endocytic machinery"
Deepali Tukaye	"The yeast endosomal $Na^+(K^+)/H^+$ exchanger, NHX1, plays an important role in cellular pH regulation"

Third and Fourth Year Submissions

Li Cheng	"Multiple Zinc Finger Protein OAZ Regulates Olfactory Receptor Neuron Development"
Curtis Chong	"Two Approaches to Anti-Angiogenic Drug Discovery"
Bruce Huang	"Development of a Tumor Metastatic Model and Microarray Analysis to Determine Candidate Genes Responsible for Metastatic Change"
Faisal Karmali	"Vertical Skew as a Function of Gravity: A Possible Consequence of Otolith Asymmetry"
Michael Nicholson	"Translation of a Novel Simian Immunodeficiency Virus $Pr55^{Gag}$ Isoform is Mediated by an Internal Ribosome Entry Site

Fifth Year and Above Submissions

Steven Chase	"The Processing of Sound Location Cues by Classes of Units in the Inferior Colliculus"
Cory Dunn	"A Genome-wide Screen for Genes Required for Viability of Cells Lacking Mitochondrial DNA Identifies a New Member of the YME1 Complex"
Su Gao	"Fasting and Leptin Exert Counter Regulatory Influences on Hypothalamic Neuropeptide Expression"
Mayra Garcia	"*In vitro* Supression of HIC-1 Replication by Measles Virus"
Xiao Liu	"An *in vivo* versus *in vitro* Comparison of Genome-wide DNA Binding of a Yeast Transcription Factor"
Wenqin Luo	"An Outer Segment Localization Signal at the Carboxy-Terminus of Photoreceptor-Specific Retinol Dehydrogenase"
Guojun Ma	"Aph-1a is Required for Presenilin-Dependent γ-secretase Complex Assembly and Enzymatic Activity in Mammals"
Tianyi Mao	"Characterization of the Drosophila Mical Protein in Axon Guidance"
Yan Zhou	"Kinectic Study of HIV-1 in the Pre-Integration State"

Thanks to those who contributed to the Restriction Digest this past year, in particular, members of the GSA, Deborah Hillard of the SAP, Wendy Sanders of the PDO, Dan Gorelick-Feldman, Rebekkah Zihn, and everyone else. It was a great success!

We wish you all a fantastic summer!

Hopkins at Artscape 2004

Check out fellow graduate student Michael Housley (BCMB) at his booth of fine art photography.

July 16-18 in the Mt. Royal Avenue Cultural Corridor

TRAVEL ESSAY:

A Very Grad Student Vacation
Feilim Mac Gabhann, Biomedical Engineering

Well, I could tell you about the conference in Santa Fe. But instead let me tell you about trinitite, Los Alamos and Contact. Given four days in January to explore New Mexico, did I make it to the Carlsbad Caverns? Did I go skiing in Taos? No, as a certified geek, I went on the trail of the early Atomic Bombs and the Very Large Array – that's right, all the satellite dishes. Like I said, a geek.

First of all, I hadn't been to the southwest before, so the joy of 75mph speed limits on ruler-straight roads is something that I wasn't expecting since I'm more used to Beltway Pinball. Cruise control has its place after all. Leaving Albuquerque it became clear that it was impossible to tell from the map if the places marked on the map as towns had 10,000 residents or (more frequently) one house and a mailbox. So we were glad we had a full tank of gas. Suggested state motto: New Mexico – Pack Your Own Lunch.

The White Sands Missile Range is where the first Atomic Bomb – Trinity – was exploded, in 1945. The site itself is only open to the public one day a year, and this was not it – but nonetheless, on the northern boundary of the NASA-could-have-faked-the-Mars-Rover-photos-here scrubland was The Rock Shop, which, as advertised, had consignment lots of rock for sale on huge tables outside. Inside was the real treasure, where they sold small amounts of trinitite – the dark green glass formed from the sand below the explosion site (the bomb was on a tower above the desert). Of course, the chintzy-tchotchke alarms are going off in my head, but no, the sales guy assures us that this is the real deal, and shows us the obligatory picture of the toothless, hairless guy who headed over the hills at night to pilfer the cracked glass, which he was displaying in his cupped outstretched hands while smiling (I think) for the camera. No mention of whether he looked like this before going in. So, now, I'm thinking – it is clearly dangerous stuff, stolen from the American people, and it cost many billions to build the weapon which turned the sand into glass and one loony to turn the glass into a souvenir – so ok, SOLD. Yes, that's right, the contraband is in the apartment, slowly frying me.

Later, at the Los Alamos Museum of All Things Atomic and Dangerous and Mushroom Clouds and Stuff (what, you think I remember the actual name?), one exhibit – ostensibly for kids, so you know no graduate student can walk past it – has a geiger counter. Suddenly remembering the alleged trinitite out in the car, the dilemma hits – to test or not to test? Agh. We were now several billion miles from the used rock salesman, and really, it didn't come with a warranty. So I did what any self-respecting scientist would do; the hypothesis is always true until contradicted, right? So hah, it's still radioactive rock to me. As a side note, the Los Alamos labs are located at the end of an outrageously breathtaking road. I nearly careened off the side in a Jetta - how they steer the explosive whatsits down the mountain I don't know.

Anyhow, despite not having seen the movie, every physics textbook I've ever had – as an engineer, that's a lot – has had pictures of the Very Large Array that features in the Jodie Foster-is-so-a-scientist movie, Contact. The main building features an even-handed description of why the film is total bunk, from the fact that she listens in headphones to interstellar broadcasts (it's a radio antenna but it takes visual images, rather than intercepting ET's cellphone), to the insertion of some wild dramatic scenery into the ludicrously flat area. I mean flat – these satellite dishes move and can be stupidly far apart. But having stripped the film of its scientific credibility (and which of us doesn't enjoy doing that?) they mention that the money they got in location fees paid for – wait for it – not new antennas, not new research facilities, not more computing power – can you guess? – new t-shirts, mugs and key chains. That's right, the movie paid for the gift shop. Almost makes me sick, disgusted with the blatant misuse of public property, but then we buy a nice ceramic tile with a radio antenna on it, and all is right with the world.

New Mexico: Selling Souvenirs to Geeks for 59 Years.

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Next Submission Deadline: August 15, 2004

Congratulations to the Class of 2004!

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On behalf of the
School of Medicine Development & Alumni Relations Office
and the
Johns Hopkins Medical & Surgical Association,

We wish the 2004 graduates the best of luck!

Don't forget to keep your contact information current with us to ensure that you receive your free subscription of *Hopkins Medicine* magazine as well as updates on important news and information on future Biennial Meetings and Reunion Weekends. The next one will be June 2-4, 2005 and you are all invited! If there is any way that our office can be a resource for you now or in the future, do not hesitate to contact us at 410-516-0776, 888-JHM-1336 (toll free), JHMalumni@jhmi.edu or One Charles Center, 100 North Charles Street, Suite 200, Baltimore, MD 21201.