

## MICROSCOOP

**FALL 2008** 





# FIRST ANNUAL "CAREERS IN MICROBIOLOGY & IMMUNOLOGY" CAREER FAIR BY BRIAN PETERS

Page 1:

Career Fair

Spotlight on Faculty

IN THIS ISSUE:

Page 2:

**Community Impact** 

Page 3:

**Grants and Awards** 

Page 4:

**New Faculty and Staff** 

**Publications** 

Page 5:

Meetings and Posters

Good News!

Page 6&7:

Remembering

Matt Graham

Page 8&9:

**New Student Profiles** 

Page 12:

Science in the

**Public Interest** 



Dr. Tom Obrig

What do you want to be when you grow up? That's exactly what two current Microbiology and Immunology students, Ranj Prabhakara and Kelsy Smith, thought to themselves as their graduation dates quickly approach. Although they were not completely opposed to the idea of transitioning from graduate student to the traditional post doc position, they had little information on other careers in the field of Microbiology. Thus, with the help of Department Chair Dr. Kaper, administrative assistant Mona Kiriakos, and several GPILS faculty and graduate students, the First Annual "Careers in Microbiology and Immunology" Career Fair was born.

The career fair was held Friday September 26 in the MSTF auditorium and was open to all GPILS students who pre-registered. The presentations were arranged into an early morning session followed by a coffee break, a mid morning session followed by lunch, and an afternoon session. Approximately 80 students from various GPILS programs attended the career fair throughout the day. The overall goal of the career fair was to showcase "alternative" careers in Microbiology and featured a total of 17 representatives

from government institutions, the private sector, undergraduate academia, scientific writing, and patent law. Presenters discussed careers as diverse as agricultural research to FDA field operations to meeting with clients to talk science. Each speaker was dynamic and provided keen insight into their jobs that couldn't have been obtained by simply doing online research or reading a pamphlet. All speakers seemed to truly enjoy their careers and were more than willing to take questions

"Fair" continues on page 3.

#### SPOTLIGHT ON FACULTY: DR. TOM OBRIG BY SMITA CHANDRAN

One could say that Dr. Tom Obrig traveled the scientific world before deciding which place he would choose to call home. He earned his Bachelors degree in Forestry from West Virginia University followed by a PhD in Plant Pathogenesis from University of Illinois, Urbana-Champaign. He then continued his scientific pursuit as a post-doc, studying mechanisms of protein synthesis at

the University of Texas, Austin, where he realized that this was an area of science that he would like to devote more time. He followed it with a Fellowship at the University of Pennsylvania where he studied gene regulation. His later appointment as Asst. Prof. at the Albany Medical College and his early work with Shiga toxin allowed him a familiarity with eukaryotic

systems and the human health aspect of science that led to him moving to the University of Virginia. There, he was able to exploit their nephrology expertise to further his understanding of Shiga toxin and its role in nephrotoxicity.

Currently, the projects in his lab are aimed at studying how Shiga toxin inhibits protein synthesis and employing a recently established murine

#### Page 2

#### **COMMUNITY IMPACT**

In this issue, the Microscoop would like to highlight the community contributions of one of our own students, Khandra Sears. Here, she describes her work at a local high school...

The ENGAGE Scholars Program

For some time now, I have been interested in becoming more involved in the community I've lived in for two years. It is truly one of the city's secrets. Union Square is an historic neighborhood filled with people from all walks of life which in Baltimore means everyone from drug dealers, their clients, artists and your average yuppie. I try to attend Union Square association meetings regularly, I practice yoga with a fellow yogi who lives down the street from me and I support neighborhood restaurants but I've also wanted to contribute something in a scholastic fashion. I recently heard about the EN-GAGE Scholars program through the UMB Outreach Council and thought it might be an initiative I would like to be involved in.

For those of you unfamiliar with the UMB Outreach Council, it was formed this year at the behest of Dr. Ramsay and is composed of about 35 students, faculty, staff and representatives from three local community schools. Vivien T. Thomas Medical Arts Academy is one of the schools participating in this partnership and it is located just outside the Union Square area on 100 N. Calhoun Street. The mission of this high school is (1) To provide ongoing one-on-one support and encouragement to students toward passing their High School Assessment; (2) To develop and maintain close relationships with students; and (3) To develop an incentive system for students that will address the challenges that they currently face. This high school has a unique focus on health professions, mathematics and the sciences.

Its ENGAGE Scholars program has been implemented specifically to assist students struggling in testing areas for the High School Assessment particularly in the subjects of Algebra, Government, Biology and English. The hope is that we tutors develop relationships with the students that will contribute to a positive learning environment. For the past several Saturdays, I and three other volunteers, have been going to the school and tutoring students from 10 a.m. to noon.

So far, it has been a challenging experience that has made me more aware not only of the difficulties faced in the Baltimore City public school system but also of the extra time and concern put in by very dedicated teachers. On the one hand, it has been refreshing to see some students coming every week with a sincere interest in learning more and stretching their capabilities. On the other hand, some of these same students seem grossly unprepared for the SATs, High School Assessment and, it would seem, life post-high school in general. Having an interest in tutoring is not enough for this; we volunteers have to be able to communicate on the students' level, be constant

sources of encouragement and translate complex concepts in simple language. This has reaffirmed my belief that a solid, basic education is the most powerful tool you can ever give someone because without the basics (and I mean basic basics) so many doors are closed to people. The few students that I have interacted with at this high school are bright kids who need the benefit of someone telling them they have what it takes to do the tasks before them. fact that they attend this school suggests that they already have a sense of what they want to do in life and for that alone they should be commended.

This has also been a very humbling experience because I realize that not matter how much I've learned over the vears, I've probably forgotten more. It has been a task to not only refresh my own knowledge but to devise effective teaching strategies. I plan to continue tutoring at the Vivien T. Thomas Medical Arts Academy not only because I think being consistent is important for these students but also because I feel it would be ungrateful of me to not pass on what has been given to me. These students need examples of what they can be and interacting with students from UMB just shows them one avenue they can take in life. And honestly, despite the surprises and frustrations I've encountered (and vented about to some of you) there is something comforting and joyful in seeing that light bulb turn on in a student's eyes.



If you would like to find opportunities to volunteer in our neighborhoods, please check out the link below and find a listing of community outreach http://medschool.umaryland.edu/community.asp

To learn more about this school go to

http:// vtma.baltimorecityschools.org/ History.html.

To find out more about the UMB Outreach Council and other ways to get involved in the communities around our campus visit

http://www.umaryland.edu/ usga/documents%2007-08/ UMB%20Outreach% 20Council

#### "CAREER FAIR" CONTINUED

and provide contact information for students interested in their specific fields. The coffee break and lunch provided excellent opportunities for students to talk one-on-one with presenters; many successful contacts were made during these times.

Overall the career fair was a huge hit with both the presenters and the students. It provided an excellent opportunity for the speakers to highlight their specific institution and to recruit graduating students; it was also great for the students to learn about new and exciting potential career choices. A big thank you to all career fair speakers: David Block (Gliknik), Robert Freund (NIH), Tod Merkel (FDA), Richard Sawyer (NIAID), Simon Elliott (Foley & Lardner), Jeff (Microbe, ASM), Fox David Donovan (USDA), Ananda Gupta (NCI),

Drew Schoeffield (Lovola), Todd Bozicevich (FDA), Sonia Hunt (FBI), John (USDA). Hammond Melinda Merrill (Novartis), Judy Kim (SKGF), Michele (AAI), Hogan Carrie Wolinetz (FASEB), and Sally Horner (AACC).

Special thanks to Kelsy, Ranj, Mona, and Dr. Kaper for all of their hard work, planning, and help to make our career decisions a little bit easier.



Students and Post-Docs sign in to the career fair.





recruit graduating students as well as post-doctoral fellows.

# The speakers were able to highlight their specific institution and

Quan won the 2008 Ollie Eylar Award for his 1st author papers, abstracts, and awards and for voluntering on campus. Congratulations Quan!

#### GRANTS AND AWARDS

#### **Grants and Awards**

Dr. Mark Shirtliff Lab

Eukaryotic Cell Outstanding Young Investigator Award (2008) awarded to Brian Peters at the 9<sup>th</sup> ASM Conference on Candida and Candidiasis.

"Vaccine development for recurrent musculoskeletal infections" Department of Defense. - W81XWH-07-1-0210. PI - ME Shirtliff. \$350,000. Sept 1, 2008 -Aug 31, 2010.

"Identification of determinants essential for biofilm formation and virulence in methicillin-resistant Staphylococcus aureus (MRSA) using a global genetic approach" PI - ME Shirtliff and KS McIver. University of Maryland, College Park . \$75,000

Dr. Hervé Tettelin Lab

Associate Professor, Insti-

tute for Genome Sciences. Department of Microbiology and Immunology, received a two years \$326,800 grant from the Platform for Appropriate Technology in Health (PATH) for his work entitled "Characterization of antigens through bioinformatics and comparative genomics - Enhancement and dissemination of the public Strepneumo Sybil package." The proposed project will enable development and dissemination of the Strepneumo Sybil Comparative Genomics Package to enhance the ability of users from both develdeveloping oped and countries to mine Streptococcus pneumoniae genomic data in the context of vaccine research.

Dr. Stefanie Vogel Lab

Ouan Nu won this year's Ollie Eylar award. This award is given to a Molecular Microbiology & Immunology student each year who has 1st author papers, abstracts, awards, presented their work at national meetings and who also volunteers on campus. He was also the recipient of a travel award to Edinburgh, Scotland, and a Young Investigator Award both from the International Endotoxin & Innate Immunity Society in August. Congratulations Quan!

#### **GPILS Awards**

Dr. Donna Farber Lab

John Teijaro from the Program in Microbiology and Immunology was given the Elaine Miye Otani Memorial Award. The Otani Award was

#### **NEW FACULTY AND STAFF**

As always, the MM&I department is a dynamic environment, with many new faces and some that we will miss. We wish the best for our recent graduates, Charlotte Andreasen who graduated in May and is doing a post-doc at Yale, and Maura Strauman who graduated in

August and just recently began a post-doc position at U Penn. We also welcome many new people into the MM&I family. May was a busy month in which Mona Kiriakos, an administrative assistant, Karoline Peterson, an epidemiological assistant, and Brijesh Patel, a labora-

tory technician, all joined the department. The department also welcomed a new office assistant, Caren Kamel in September. Dr. Moudgil welcomes two new postdoctoral fellows, Hua Yu, who joined us in June, and Steva Komeh-Nkrumah.



Charlotte Anreasen is currently doing a post-doc at Yale.

#### **PUBLICATIONS**

◆Ammerman NC, Rahman MS, Azad AF. (2008) Characterization of Sectranslocon-dependent extracytoplasmic proteins of *Rickettsia typhi*. Journal of Bacteriology 190 (18): 6234-42.

◆Andreasen C, and Carbonetti NH (2008) Pertussis toxin inhibits early-chemokine production to delay neutrophil recruitment in response to Bordetella pertussis respiratory tract infection in mice. Infection & Immunity 76 (Nov) [Epub ahead of print Sep 2]

Bek-Thomsen M, **Tettelin** H, Hance I, Nelson KE, Kilian M. (2008) Population diversity and dynamics of *Streptococcus mitis*, *Streptococcus infantis* in the upper respiratory tracts of adults, determined by a nonculture strategy. Infection & Immunity May;76 (5):1889-96.

◆Brady R, Leid JG, Calhoun JH, and Shirtliff ME. (2008) Osteomyelitis and the role of biofilms in

chronic infection. FEMS Immun Med Micro. 52:13-22, 2008.

Calhoun JH, Manning M, and **Shirtliff ME**. (2008) Long bone osteomyelitis. Sem. Plastic Surg.

**Flajnik M.** Evolution of the Immune System, ed. Paul WE, 6<sup>th</sup> edition Fundamental Immunology

Fujii J, Wood K, Matsuda F, Carneiro-Filho BA, Schlegel KH, Yutsudo T, Binnington-Boyd B, Lingwood CA, Obata F, Kim KS, Yoshida S, **Obrig T** (2008) Stx2 causes apoptosis in human brain microvascular endothelial cells Via CHOP. Infect. Immun. 76: 3679-3689.

Fux CA, Stoodley P, Shirtliff ME, and Costerton JW. (2008) Biofilms. Antimicrobial Drug Resistance: Principles and Practice for the Clinic and Bench. ed Mayers DL. Infectious Disease Series. ed Georgiev VS. Humana Press. March.

Kilian M, Poulsen K, Blomqvist T. Håvarstein

LS, Bek-Thomsen M, **Tettelin H**, Sørensen UB. (2008) Evolution of *Streptococcus pneumoniae* and its close commensal relatives. PLoS ONE. Jul 16;3 (7):e2683.

◆Jacobsen SM, Lane MC, Harro JM, Shirtliff ME\*, and Mobley HLT\*. (2008) The high-affinity phosphate transporter Pst is a virulence factor for *Proteus mirabilis* during complicated urinary tract infection. FEMS Immun Med Micro. 52(2): 180-9.

◆Jacobsen SM, Stickler D, Mobley HLT, and Shirtliff ME. (2008) The role of *Escherichia coli* and *Proteus mirabilis* in catheter-related urinary tract infections. Clin Micro Rev. 21(1):26-59.

Jandhyala DM, Ahuwalia A, **Obrig T**, and Thorpe CM. (2008) ZAK: A MAP3 Kinase that transduces Shiga toxin and ricin induced proinflammatory cytokine expression. Cellular Microbiol. 10:1468-1477.

Kim E.Y., H.H. Chi, R.



A large group from our department went to the 108th General Meeting of the American Society for Microbiology, Boston, MA, June 1-5, 2008.



Dr. Mark Shirtliff

#### MEETINGS AND POSTERS

◆Ayala, V and Carbonetti, NH (2008) "Pertussis toxin exacerbates a subsequent influenza virus infection" American Society for Microbiology 2008 Meeting, Boston, MA

◆Bowen S, DNA damage response to VDJ recombination at distinct stages of T lymphocyte development. FASEB, Phoenix, AZ, June 2008.

◆Brady RA, O'May G, Leid JG, Costerton JW, and Shirtliff ME. Protective vaccine against chronic infections due to Staphylococcus aureus biofilms. 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

Cope EK, Shirtliff ME, O'Toole G, and Leid JG. Flagella in Pseudomonas aeruginosa mediates human leukocyte cytokine cross talk, production of lactoferrin, and bacterial biofilm killing. 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

**Flajnik, M**. Molecular Evolution as the Driving Force in Infectious Dis-

ease. Keystone Meeting April 8-13, 2008.

Leid JG, Gmerek A, Neveling L, Kofonow J, Cope E, Sanderson A, Healy D, Hunsaker D, Schwartz E, Shirtliff ME, Cohen N, Palmer J. Biofilms in chronic rhinosinusitis 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

Moudgil KD. Regulation of autoimmune arthritis by heat-shock protein 65induced pro-inflammatory cytokines. 6th International Congress on Autoimmunity, Porto, Portugal, September 10-14, 2008.

♦Nhu QM, Shirey KA, Netzel-Arnett S, Zhao A, Antalis T, Shea-Donahue T, Fasano A, Vogel SN. Cell-type specific PAR₂ activation differentially regulates TLR4 signaling in mucosal epithelial cells and macrophages. 10th Biennial meeting of the International Endotoxin & Innate Immunity Society, Edinburgh, Scotland UK, July 30-August 2, 2008.

O'May GA, **\( \strict{\subset}{Jacobsen S}**, Mobley HLT, and **Shirtliff ME**. The pst operon of *Pro-*

"Meetings" continues on page 10.

#### **GOOD NEWS!**

**Babies!** Marco Goicochea and his wife Lindsay welcomed a son, Gabriel Owen Goico**chea** into their family on August 15, 2008. He weighed 7lbs and 12.2 oz. and was 20 and 7/8 inches long. Gavin William Laird was born to Michelle Laird and husband, Eric, on March 22, 2008 at 7:05AM. He weighed 5lb 12.5 oz and was 17 in. long. He decided to surprise everyone and by coming 5 weeks early!

Cheers! Jessica Molidor, daughter of June Green, married Adam Whittemore on June14, 2008 at an outdoor ceremony at the Stepping Stone Museum in Havre de Grace. June's grandson, Finn, served as the ring bearer. **Kristen Burdette** married Theodore Shatynski on July 12, 2008. Congratulations, Kristen and Ted! **Rajesh Rajaiah**, married Kavitha S on May 2, 2008 in India. Best Wishes!

**Other News Carly Page** and Dr. Martin Flainik ran the Baltimore Half Marathon on October 11, 2008. Although she gave Dr. Flajnik a 13 minute handicap, Carly still beat him and won \$50 from the bet! Carly finished in 1:47:10, Dr. Flajnik fin-2:07:45. ished in Melissa Haves and Elizabeth Urban also participated in the Baltimore Running Festival in

the 5K event. For Elizabeth, this was her first road race, completed in 31:29. Melissa set a personal record for a 5K in 23:56. Congratulations to all! Mike Criscitiello took an Asst. Professor position at Texas A&M Veterinary Biomedical and Medical Sciences. Another former Flajnik Lab member, Helen Dooley, took a permanent position at Wyeth Pharmaceuticals in Aberdeen, Scotland.

The students beat the faculty at volleyball during the annual Department Picnic. The faculty still owe the students a happy hour!



Gavin William Laird



Gabriel Owen Goicochea



Rajesh and Kavitha, married Friday, May 2, 2008.

MICROSCOOP Page 6

#### REMEMBERING MATT GRAHAM

In losing Matt Graham to cancer this month, we lost a member of our family, someone who touched us in so many ways. The Microscoop staff wanted to honor Matt's memory in this issue. The only way to demonstrate how much Matt has touched our lives was to hear from all of those who wanted to share. The following are memories shared by other members of our MM&I family.

Matt applied to join our graduate program but unfortunately was offered a place this year. I had the unpleasant task of informing Matt that he had not been accepted, and I was afraid that he would be upset or even angry. Instead he took the news calmly and then proceeded to say that he had heard that I was looking for a lab technician (which I was) and asked if I would consider him for the job. I offered him the position soon afterwards and he joined my lab in June, overlapping with Charlotte just long enough to pick up some of our standard as-He was able to carry out several experiments and terrorize a bunch of mice in the short time with me, and he

brightened up the lab with his outgoing personality and his sense of humor. We will miss him tremendously—Nick Carbonetti, Director, Program in Molecular Microbiology and Immunology

Hmm, a story about Matt. Which one to choose? A story about his love of good food? How he was in heaven when Helen Dooley introduced him to JJ rolls (sushi) and the roll with cream cheese and salmon (his favorite) at Cross St market? maybe a story about how he was always willing to give someone a ride but sometimes he'd talk too much and would get lost? Or a story about how he was always willing to lend an ear (or a hand)? No, I think I'll tell a story about how he was such a good sport. Khandra, Matt and I recently went to Home Depot to buy a few things and stopped for lunch on the way home. There was a 'Ross' store at the strip mall and we decided to do some shopping. Khandra picked out a shirt for Matt that had a very bold floral design. He kept saying 'no, it's disgusting' but we eventually managed to convince him to try it on. As soon as he put it on, Khandra and I burst out

laughing. Matt, very calmly, took the shirt off and put it back on the rack. His good humor was only one of his many wonderful attributes. Goodbye Matt.—Sharon Tennant, Postdoctoral Fellow Galen lab, Center for Vaccine Development

To me, Matt was a kind-hearted person who would always go the extra mile for those around him. His smile was warm and easy making the people he came into contact with immediately comfortable - which is a rare gift. I will be miss him. - June Green, Coordinator, Program in Molecular Microbiology and Immunology





"His good humor was only one of his many wonderful attributes." Sharon Tennant









"Matt was
always ready
and willing to go
anywhere or do
anything,
whether just for
fun or helping
someone out."
Heather Ezelle



#### REMEMBERING MATT GRAHAM

I played a few softball games with Matt this past spring. I didn't have my own glove, so he lent me his to use. He told me it was the glove he had had since little league. That told me two very important things about Matt. First, that he had a big sentimental heart, to have saved that glove all this time when he clearly couldn't use it anymore. Second, it spoke of his tremendous generosity, that he would let me use an item that held such dear memories. -Melissa Hayes, student, Arenavirus Lab, IHV

My favorite memories of Matt are of him sitting on a barstool in Pickles, just



talking amongst friends at happy hour. I picture him sitting there trying to convince everyone to go camping in Tennessee for a three day music festival, or maybe go down to Ocean City for a weekend, or meet up on Saturday to play golf (even though none of us play). Matt was always ready and willing to go anywhere or do anything, whether just for fun or helping someone out. After Matt was hospitalized, similar stories kept coming up. "I have my diving certification because of Matt." "I was supposed to hang out at Matt's house and ended up in Key West instead." And the very common "Matt helped me move." Happy hour won't be the same, but we'll all have a pint in Matt's honor. Cheers Moose! -Heather Exelle, Research Associate. Greenebaum Cancer Center

I have so many good and "interesting" memories of Matt it was hard to find a good story that was also appropriate to tell. Matt and I both played for Occam's Bats, the joint Micro & Immuno and Biochem departments' softball team, and we rode to games together. Most of my friends know that I

have a terrible sense of direction and can be pretty clueless when it comes to maps. Matt, on the first day we have a game, Google maps the location of the fields, prints the map without the turn by turn directions and hands it to ME to navigate. Needless to say we got a little lost on the way to the game. tried this trick a couple of times with me refusing each time to give directions because I was not about to get us lost and then have him blame me. I think he finally gave up on inspiring me to learn how to read a map. What's even funnier is that he would inevitably get us turned around on way home from games - one time we wound up heading south to DC - because he was so busy talking (we all know how quiet I am J). Oh and he referred to the landmark church on the corner of my street as "that big building" which I always took (mock) offense to right before he'd drive right past my house for the thousandth time. Missing you Matt. Khandra Sears, student, Azad Laboratory

MICROSCOOP Page 8

#### **NEW STUDENT PROFILES**

Nathan Archer hails from Sheboygan, Wisconsin. He earned a BS in Biochemistry from University of Wisconsin, Madison. There, he worked in a lab for two years studying syndecan-1. His research involved working out the signaling pathways of syndecan-1 in breast cancer cells. He is interested in cancer, HIV/AIDS, and vaccine research & development. In his free time, Nate likes fishing and being out on the water. He also enjoys sports such as football, basketball and tennis, as well as trying different foods.

Min-Nung Huang is from Kaohsiung, Taiwan, and earned his M.D. from the National Taiwan University School of Medicine. extensive research experience includes a summer at the Institute of Biochemistry and Molecular biology at the National Taiwan University School of Medicine detecting ER variants in patients with breast cancer; and two vears in the lab Clinical Immunology at National Taiwan University Hospital (NTUH) studying soft tissue sonography on evaluation of cellulitis; the role of nuclear autoantigens, autoantibodies and immunocomplexes in autoimmune hepatitis; mechanisms of relative unresponsiveness of CRP in patients with SLE; and clinical applications of capillaroscopy on differential diagnosis of Raynaud's phenome-

Min-Nung has had non. several jobs, which include an internship at NTUH, an assistant medical staff position in the Taiwanese Medical Mission in Sao Tome and Principe, a residency in Internal Medicine at NTUH, and a fellowship in rheumatology and clinical immunology, also at NTUH. He is current research interests are in autoimmunity and immune tolerance. Outside of rehe enjoys bird search, watching, badminton, tennis, hiking, and playing with his child. His baby boy is nine months old and Min-Nung is trying his best to be a good father, a good husband and a good graduate student all at the same t m **Kimberly Jennings** is from Landover, Marvland, She earned her BS from University of Maryland, Eastern Shore. Kimberly's diverse research experience include working at UMBI/ COMB during the summer of 2006, Ohio State University during the summer of 2007, and NIA/ LMG the summer before starting here at UMB. Her research interests include bacteriology and host- parasite interactions. In her spare time, Kimberly likes bowling and playing Nintendo Wii, but she also likes just hanging out and relaxing.

**Nicolas M. Johnson** (MD/PhD) is a native of Balti-

more Maryland. She received a BS in Biological Sciences at University of Maryland Baltimore County. There, she completed four years of undergraduate research with Dr. Michael F. Summers doing NMR Spectroscopy HIV-1 structural proteins. She also completed a summer internship with Dr. David Ginty in the Department of Neuroscience at Johns Hopkins University School of Medicine. She is interested in the manipulation of the host immune response to treat immunemediated illnesses. In her spare time, Nicolas enjoys mentoring adolescents and teens. She plays tennis, and enjoys other sports such as football, basketball, tennis, track and field. She also enjoys writing/reciting poetry, reading classic literature, attending plays and recitals, and cooking international cuisine.

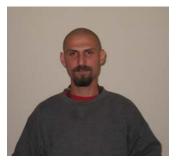
Joshua Lieberman's (MD/ PhD) current place of origin is Baltimore, Maryland. He received a BS in Microbiology from University of Maryland, College Park. During his undergrad, he worked for three years with Dave Mosser and spent one summer working Selma Jeronimo, a natal RN. in Brazil. He also worked for a year post-bac under Carolina Barillas-Mury at the NIAID. When asked about his research



Nathan Archer



Kimberly Jennings



Joshua Lieberman

#### NEW STUDENT PROFILES CONT.

interests, Josh proudly states that he "studies poop". Actually, he's in the Donnenberg lab studying the EPEC bundle-forming pilus, but would prefer to say that he studies poop - "it tends to get more of a reaction out of non-scientists that isn't a blank stare". His other research interests include bacterial pathogenesis, immune evasion, biofilms, and molecular machines. For fun, Josh does Tai Chi, Yoga, Kung Fu and also plays soccer.

Daniel Powell's hometown is San Angelo, Texas. He earned a BS Biology and BA Chemistry from Southern Methodist University in Dallas. There, he worked under Larry Ruben using RNAi to inhibit cell division regulation genes in *T. brucei*. He later worked at Lexicon Genetics (now Lexicon Pharmaceuticals), doing hematol-

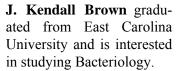
12/9: Achsah Keegan

12/16: Rajesh Rajaiah

ogy screening of genetic knockouts in mice to identify clinically relevant genes/phenotypes. Before coming to UMB, Daniel worked in the lab of J. Victor Garcia at University of Texas Southwestern in Dallas, which used humanized mice to study HIV transmission and prophylactic treatments. There, he published a paper titled. "Antiretroviral Preexposure Prophylaxis Prevents Vaginal Transmission of HIV-1 in Humanized BLT Mice" in PLoS Medi-In his free time, cine. Daniel likes cooking and running.

Harold Steiner III grew up in Freeburg, Illinois, which is near St. Louis. He graduated from Illinois State University with a BS in Chemistry and a minor in Philosophy. During his undergrad, Harold worked as a

student co-op at Sigma-Aldrich in St. Louis, where he worked on rational design of photodynamic therapy drugs. He went on to receive a MS in Biochemistry/Biotechnology from University of Missouri, St. Louis, where he worked on crystallization of metal-binding bacterial transcription factors. He is interested in studying gene therapy and host/pathogen interactions. Harold likes to write and he maintains a blog discussing various things, including the intersection of science and phi-He also has losophy. a large and diverse collection of board and card games.





**Daniel Powell** 



Harold Steiner III

# JOURNAL CLUB SCHEDULES: LUNCH IS PROVIDED AT IMMUNOLOGY AND BACTERIOLOGY JC'S, WINE AND CHEESE IS SERVED AT INV JC.

#### **Immunology** Bacteriology Intitute of Human 12:00 BioPark1 Rm. 309 12:00 HSFII Rm S341 Virology 10/28: David Scott 10/30: Brian Peters 5:00 IHV 3rd Fl. Lightwell 11/4: Prasad Rallabhandi 11/6: Mark Marohn 11/5: Mark Lafferty 11/11: Steve Bowen 11/13: William Hsiao 11/19: Marco Goicochea 11/18: Mark Williams 11/20: Anne-Marie Hansen 12/3: Jean Carr 11/25: Ai-Hong Zhang 12/4: Leon DeMasi 12/2: Kristen Shatynski 12/11: Nick Carbonetti

12/18: James Kaper



J. Kendall Brown

MICROSCOOP Page 10

#### GRANTS AND AWARDS CONT.

established in remembrance of Elaine Miye Otani, a graduate student whose life was tragically cut short when she was only 26. It is given annually to a graduate student in GPILS of outstanding character who demonstrates superior academic performance and who shows outstanding promise as an independent investigator.

Dr. Martin Flajnik Lab

Dr. Flajnik, Professor in Microbiology and Immunology, received the GPILS Teacher of the Year award for excellence in teaching and organizing both the GPILS core course and the Immunology course.

# Graduate Student Presentations

Each summer Microbiology and Immunology students are required to present their research at a departmental minisymposium. John Teijaro won for the best senior student presentation. Teresa Hsi won the best 1<sup>st</sup> year student presentation. Congratulations to John & Teresa!



Dr. Martin Flajnik, GPILS
Teacher of the Year, given for
excellence in teaching and
organizing the GPILS core
course and Immunology

#### MEETINGS AND POSTERS CONT.

teus mirabilis HI4320 and its role in biofilm formation. 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

◆Peters BM, Jabra-Rizk MA, Leid JG, Costerton JW, and Shirtliff ME. Candida albicans and Staphylococcus aureus Mixed Species Biofilms. 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

◆Peters BM, Shirtliff ME, and Jabra-Rizk MA. Characterization of the interaction between *Candida albicans* and *Staphylococcus aureus*. 9th American Society for Microbiology Conference on Candida and candidiasis. Jersey City, NJ, March 24 - 28, 2008.

♦ Prabhakara R, Leid JG, Costerton JW, and Shirtliff ME. Immune response to Staphylococcus aureus biofilm infections. 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

Shirtliff ME - Session Chair "Host-Pathogen Interactions in Biofilm Infections" Session Chair. 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

Shirtliff ME - Presenter. "Sensing and biofilms - biofilm effect on antimicrobial agents and effect of antibacterial agents on biofilm formation." 48th Interscience Conference on Antimicrobial Agents and Chemotherapy/46th Infectious Disease Soci-

ety of America Joint Annual Meeting, Washington, D.C. October 25-28, 2008.

Shirtliff ME -Presenter."Host Immune Response in Chronic Staphylococcus aureus Biofilm Infections" 108th General Meeting of the American Society for Microbiology, Boston, Massachusetts, June 1-5, 2008.

Shirtliff ME - Presenter." Biofilm-Mediated MRSA Infections: Slime by Design" Division of Infectious Diseases, Johns Hopkins University - School of Medicine, Baltimore, Maryland, April 21, 2008.



Ranjani Prabhakara presented at the 108th General Meeting of the American Society for Microbiology, in Boston, MA, June 1-5, 2008.

#### SPOTLIGHT ON FACULTY CONT.

model for Hemolytic Uremic Syndrome (HUS) to further our understanding of the renal and CNS effects of this disease. With the help of the mouse model, he is venturing into 'transitional medicine' where research is directed towards discovering therapeutic agents. He is in collaboration with re-

searchers at Tufts University as well as Eli-Lilly with the goal of achieving a regimen of therapeutics that can successfully target different stages of the disease. (He is looking for some enthusiastic graduate students to study mechanisms of apoptosis and CNS damage in the murine model!).

In his spare time, Dr. Obrig enjoys hiking in the forest (going back to his roots) and traveling. Interestingly, he chose to live in the city and walk to campus so he often enjoys going down to the harbor area and enjoys the sights and sounds of our Charm City. Welcome to our department, Dr. Obrig!

# The Journal of Infectious Diseases

An image from a recent publication from the Obrig lab made the cover of The Journal of Infectious Diseases, November 1, 2008. The image is of spinal cord tissue that has the E. coli Shiga toxin receptor Gb3 expressed on neurons (green), but not on astrocytes (red) or endothelial cells (blue).

#### PUBLICATIONS CONT.

Rajaiah, and **K.D. Moudgil**. (2008) Exogenous tumor necrosis factor-alpha induces suppression of autoimmune arthritis. *Arthritis Res. Ther*.10: R38.

Kim, E.Y., H.H. Chi, M. Bouziane, A. Gaur, and **K.D. Moudgil**. (2008) Regulation of autoimmune arthritis by the proinflammatory cytokine interferon-gamma. *Clin. Immunol*.127: 98.

Kolling GL, Obata F, Gross LK, and **Obrig TG** (2008) Immunohistologic Techniques for Detecting the Glycolipid, Gb3, in the Mouse Kidney and Nervous Systems. Histochem. Cell Biol. 130: 157-164.

Moore CC, Martin EN, Obrig TG, Linden J, Scheld WM (2008) An A2a adenosine receptor agonist, ATL313, reduces inflammation and improves survival in murine septic shock models. BMC Infect. Dis. (in press).

**Moudgil, K.D.** and M. Durai. (2008) Regulation of autoimmune arthritis by self heat-shock proteins. *Trends. Immunol.* 29: 412.

Obata F, Tohyama K, Bonev AD, Kolling G, Keepers TR, Gross LK, Nelson MT, Sato S and **Obrig TG** (2008) Shiga toxin affects the central nervous system through receptor Gb3 localized to neurons. J. Infect. Dis. (in press).

◆Plaut RD and Carbonetti NH (2008) Retrograde trafficking of pertussis toxin in mammalian cells. Cellular Microbiology 10:1130-1139.

Rallabhandi P\*, ◆Nhu QM\*, Toshchakov V, Piao W, Medvedev A, Hollenberg M, Fasano A, Vogel SN. Analysis of PAR2 and TLR4 signal transduction: A novel paradigm for receptor cooperativity. Journal of Biological Chemistry. 283(36):24314-25.

Roche JK, Stone MK,

Gross LK, Lindner M, Seaner R, Pincus SH, and **Obrig TG**. (2008) Postexposure targeting of specific epitopes on ricin abrogates toxin-induced hypoglycemia, hepatic injury and lethality in a mouse model. Lab. Invest. (in press).

Scheper MA, Shirtliff ME, Meiller TF, ◆Peters BM, Jabra-Rizk MA. (2008) Farnesol, a Fungal Quorum-Sensing Molecule, Triggers Apoptosis in Human Oral Squamous Carcinoma Cells. Neoplasia Sept;10(9):954-63.

Volansky R and ◆Peters BM. (2008) S. aureus may have a synergistic relationship with C. albicans: Fungal infection may pave the way for S. aureus. Infectious Disease News. July.

\* Authors contributed equally

♦Student publication Faculty member



Dr. Kamal Moudgil, published in Arthirtis Research & Therapy and the Journal of Clinical Immunology this year.

# SCIENCE IN THE PUBLIC INTEREST: Using Genomics to Study Microbes: Applications in Forensic Analysis by Preeta Dasgupta

Preeta Dasgupta(PD) met with Dr. Jacques Ravel (Dr. JR), Associate Professor at the Institute of Genome Sciences and the Department of Molecular Microbiology and Immunology and Graduate Program in Life Sciences.

**PD:** Recently, you provided important genetic data that the FBI used to implicate Bruce Ivins in the anthrax killings case. Could you describe your role?

**Dr. JR:** While we were at TIGR, our team [including Dr. David Rasko and Dr. Claire Fraser-Liggett] was approached by the FBI, to help them understand where the spores in the letters came from. The spores were identified as Bacillus anthracis strain Ames. A lot of people [globally] had access to Ames. The question became, was there any difference between the genome of the strain found in the letters and the strain most people were using. It became evident that there was actually no difference- it was too voung evolution wise and mutations had not accumulated on the Ames genome. That was a big problem, because the potential suspects were everybody who worked with Ames.

**PD:** Could you tell us about *B. anthracis* Ames?

**Dr. JR:** Ames is a strain that was isolated in 1981 in Sarita, Texas from a dead fourteen-month old female Beefmaster heifer. At that time, USAMRIID, in Fort Detrick was working on anthrax vaccines and they needed a highly virulent strain of *B. anthracis* to challenge their vaccines.

The Ames strain was shipped to USAMRIID in February 1981. That strain, became the workhorse of all the labs that worked on *B. anthracis* around the world.

**PD:** How were you able to narrow down the suspects?

Dr. JR: Because isolates of Ames could not be differentiated by genome sequencing, we started to think in terms of population genetics. If you look at a flask where bacteria are growing, 99.99% of times you have the same genome sequence. But, every time you grow something, there is always a chance for mutations to occur. If mutations occur very early on, then you end up with that variant being dominant in the culture. Often it does not happen early on, but later, you end up with a subpopulation of this genetic variant. Each variant (if you separate them) will have a few polymorphic sites (SNPs, insertion/ deletion).

**PD:** So how did this apply to the *B. anthracis* from the letter attacks?

**Dr. JR:** We decided to find out if there was a population like this in the letters. Now the question was how do we identify the variants? Often a lot of them do not have phenotypes, or if they do, it is not one that can be assayed easily. So we looked for some obvious phenotypes like sporulation deficiency, colony morphology or color, among others. We found some variants showing up on plates. We did the same [experiment] with the original Ames ancestor and did not see any [variants]. So, we were pretty confident that it was something in the spore sample from the letters and not the wild type spores. Then we took the variants and sequenced their genome. We started to detect and identify differences in the genomes that correlated with the phenotypes. Most of them were related to the sporulation pathways. So, we had a nice genotype to phenotype associationa set of genetic markers that we could use to develop assays and screen all the spore preparations the FBI subpoenaed from scientists in the US and around the world. Several morphotypes were identified, but four were used in the screening. We screened thousands of spore preparations



and only one came up with this unique combination of four markers. The spores came from a flask at USAM-RIID referred to as RMR-1029 and was in the custody of Bruce Ivins.

So science was key in taking a pool of suspects from thousand plus people all around the world who worked on Ames, to just a few people who had access to the flask. That was the combination of science and police investigative work that led to Bruce Ivins being suspected. We only participated in the science!

### NEWSLETTER OF THE SCHOOL OF MEDICINE DEPARTMENT OF MICROBIOLOGY & IMMUNOLOGY

Department of Microbiology and Immunology

University of Maryland School of Medicine

Room 326, Howard Hall

660 West Redwood Street

Baltimore, Maryland 21201

Phone: 410-706-7110 Fax: 410-706-2129

http://medschool.umaryland.edu/microbiology

Chairperson – James Kaper, Ph.D.

jkaper@umaryland.edu

Program in Molecular Microbiology and Immunology

Director - Nicholas H. Carbonetti, Ph.D.

ncarbone@umaryland.edu

Coordinator - June Green

jgreen@umaryland.edu

The Micro-Scoop Staff

Smita Chandran schan009@umaryland.edu

Preeta Dasgupta pdasg001@umaryland.edu

Melissa Hayes mhaye003@umaryland.edu

Brian Peters bpete002@umaryland.edu

Kristen Shatynski kburd001@umaryland.edu