The microbiology department is ringing in the new year by adding a new faculty member—Michael Gray, Ph.D.

Gray comes to Birmingham from the University of Michigan, Ann Arbor, where he battled winter snow for five years. Now he has stored his snow shovel (just in case we have another snow-mageddon) and is ready for an unpredictable balmy/freezy Birmingham winter.

While pursuing his bachelor’s degree, Gray focused on research in Food Science at Cornell University, Ithaca, New York. He worked on characterizing the growth and survival of *Vibrio parahaemolyticus* isolates under stress and examined the cytopathogenicity of *Listeria monocytogenes* strains. After graduation in 1999, he moved on to the University of California, Davis, where he received a master’s degree in food science, and then to the University of Wisconsin, Madison, where he received his Ph.D. in 2010.

Gray entered the postdoctoral program at the University of Michigan where he conducted research on bacterial responses to proteotoxic reactive chlorine stress, using biochemical, genetic, transcriptomic, physiological, and biophysical methods.

Now, at UAB, Gray will be pursuing the molecular biology of bacterial stress response, in particular focused on how members of the gut microbiota respond to reactive chlorine species.

“I am interested in how bacteria respond to reactive chlorine species (RCS) and the role that those responses may play in host-microbe interactions,” explains Gray. “This has led to several ongoing lines of research including characterizing RCS-specific gene regulation, exploring the role and regulation of inorganic polyphosphate under severe oxidative stress, and examining oxidative stress responses in symbiotic gut microbes.”

Gray has received many honors including awards from General Mills, the National Dairy Promotion Board, and the Ruth L. Kirschstein National Research Service Award, and he has served as a peer reviewer for the *Journal of Bacteriology, Molecular Microbiology, Journal of Applied Microbiology, Environmental Science & Technology, Antonie van Leeuwenhoek Journal of Microbiology, and PLOS One*. He is a member of the American Society for Microbiology.

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**Save the Date**

**Bertram M. Marx Lecture**

Speaker: Roy Curtiss, III, Ph.D.

March 15, 2016 | Noon
Volker Hall LECTURE ROOM B
November 13-15, 2015, UAB Microbiology Department faculty, postdoctoral fellows, graduate students and special guests gathered in Chattanooga at the Chattanoogan Hotel for our annual research retreat. This year’s retreat—number 24—was once more a wonderful opportunity for members of the department to focus on science and to establish new collaborations away from the distractions of everyday life.

A Different Approach
It has been a long time since the retreat was held in a metropolitan area. According to David Briles, Ph.D., this change in atmosphere worked well. “The excellent meeting facilities and the careful planning of both the micro administrative staff and the staff at the Chattanoogan gave us what we needed to have a very successful meeting,” says Briles. Even the staff at the Chattanoogan thought the meeting went well as they complemented our students saying that they were the best behaved group they had ever had.

Additionally, this was the first retreat to include non-trainee researchers. Lab assistants, technicians and visiting scientists were able to participate in all of the retreat activities. Several non-trainees presented posters with great success. Others like Stacy Hall (Novak lab) took advantage of discussing processes and procedures with researchers from other labs. “It was like breaking a hole in a brick wall,” says Hall. “I was able to connect with people I had never met and discuss some of the more technical aspects of procedures common to a wide variety of lab disciplines. It was really a great experience for me personally and professionally.”

Presenting Research
The retreat began on Friday afternoon with talks by students and postdocs. The talks were varied and interesting and were followed by lively question and answer sessions. A poster session was next on the agenda, with 31 trainees and 4 non-trainee researchers presenting their research, a record number! Participants then went to one of two nearby restaurants, Public House and Meeting Place, for an offsite casual dinner. Student and postdoc presentations continued on Saturday morning. Faculty judges of these presentations uniformly agreed that they had a very difficult assignment due to the overall high quality of both talks and posters. The award winners are listed in the accompanying table.

Free Time
Before breaking for lunch on Saturday, Dr. Lund set up the retreat group photo, no small feat given the number of participants. After a buffet lunch, there was free time to explore the many sites of Chattanooga including the Tennessee Aquarium, rated as the best aquarium in America, and the Riverwalk.
Keynote Speaker: Flavius Martin

A highlight of the retreat was the Saturday evening talk by keynote speaker Dr. Flavius Martin, a former postdoctoral fellow with John Kearney (1993-1998).

After leaving John’s lab, Flavius went into the biotechnology area, starting at Genentech, and is now Vice President and Head of Discovery Research Oncology and Inflammation at Amgen, Inc. in Thousand Oaks, California. Amgen is the world’s largest independent biotech firm, and its two major biologics are currently Neulasta/Neupogen, analogs of granulocyte-colony stimulating factor used to stimulate production of infection-fighting granulocytes in patients undergoing cancer chemotherapy, and Enbrel, a soluble Tumor Necrosis Factor Receptor used to treat rheumatoid arthritis and other autoimmune diseases.

Flavius discussed ongoing efforts to harness the immune system to fight cancer by developing bifunctional antibodies that can target tumor cells and simultaneously recruit immune effectors. He also talked about Amgen’s recent acquisition of deCode Genetics, an Icelandic biotech company that has sequenced the genomes of 1 out of every 100 people in that country and has corresponding clinical data. Given such extensive coverage and the relative genetic homogeneity of the Icelandic population, Amgen hopes to use this approach to identify new target genes for common disease such as Alzheimer’s. Dr. Martin’s talk was witty, informative, and very well received and provoked a lot of questions.

Faculty Talks

The retreat concluded on Sunday morning with three interesting talks by departmental faculty members, Drs. Ming Du, Michael Niederweis and Mark Walter, followed by the awards ceremony with closing remarks by department chair Dr. Fran Lund. The site and the science, along with tremendous help from the microbiology administrative office, made for a great retreat.

View the 24th Annual Microbiology Research Retreat Scrapbook

2015 Microbiology Research Retreat Award Winners

<table>
<thead>
<tr>
<th>Oral Presentations</th>
<th>Poster Presentations</th>
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<tr>
<td><strong>Graduate Students (4 years and up)</strong></td>
<td><strong>Graduate Student</strong></td>
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<tr>
<td>1. Mikhail Pavlenok</td>
<td>1. Xiaojiao Xue</td>
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<tr>
<td>2. Preeyam Patel and Sara Stone (tie)</td>
<td>2. Kathryn Doornbos</td>
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<tr>
<td><strong>New Investigator (0-3 years)</strong></td>
<td><strong>New Investigator</strong></td>
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<tr>
<td>Cameron Crawford</td>
<td>1. Uday Tak and Anakul Shenoy (tie)</td>
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<td><strong>PostDoc</strong></td>
<td>2. Jessica Peel</td>
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<tr>
<td>Norberto Gonzalez-Juarbe</td>
<td><strong>Non-trainee Category</strong></td>
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Federal Funding Important to UAB and Birmingham’s Economy
By Louis Justement, Ph.D.

In 2013, the University of Alabama at Birmingham had an economic impact on the state of Alabama that exceeded $5 billion. UAB is Alabama’s largest employer, and it has generated more than 58 start-up companies, a business incubator, and at least 20 promising drug treatments for intractable diseases.

How much more could UAB do if more federal funds were available for scientific research?

“We are now at a critical time for encouraging our legislators to support continued funding for research agencies at the federal level.”

Federal spending limits have caused a decline in biomedical research across the nation. As we are cutting back on research, many of our global economic competitors are increasing their funding for science and technology. Justement says this has real effects on the future of the United States and threatens the economic vitality of Birmingham.

Justement is active at the national level in efforts to highlight the importance of supporting funding for key research agencies including the National Institutes of Health and the National Science Foundation.

For more information, read Congress must commit to science funding in budget talks

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Department Events

**January 12**
Seminar Series - Dr. Tom Braciale, Department of Pathology, University of Virginia School of Medicine

**January 19**
Seminar Series - Dr. Xiaojiang Chen, Department of Biological Sciences, University of Southern California

**January 26**
Seminar Series - Dr. Lyse Norian, UAB, Department of Nutrition Sciences, Tumor immunology and obesity

**February 2**
Seminar Series - Dr. Tonya Webb, Department of Microbiology and Immunology, University of Maryland School of Medicine

**February 9**
Seminar Series - Dr. Mark Young, Dept of Plant Sciences & Plant Pathology, Montana State University

**February 23**
Seminar Series - Dr. Erica Ollmann Saphire, The Scripps Research Institute

**March 1**
Seminar Series - Dr. Andrea Schietinger, Memorial Sloan Kettering Cancer Center

**March 15**
Marx Lecture - Dr. Roy Curtiss, III
Noon
Volker Hall LECTURE ROOM B

**March 22**
Seminar Series - Dr. Ajay Chawla, Cardiovascular Research Institute, Departments of Physiology and Medicine

**March 29**
Seminar Series - Dr. Hung Ton-That, Department of Microbiology and Molecular Genetics, The University of Texas Health Sciences Center at Houston (Co-sponsored by Pediatric Dentistry)

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We’re on the web:

[http://www.uab.edu/microbiology](http://www.uab.edu/microbiology)
Gail Cassell chaired the UAB Department of Microbiology from 1987 until 1997. In her tenure as chairman, Dr. Cassell enhanced the national and international stature of the Department of Microbiology by significantly improving research, graduate studies, and grant funding for both research and training so that the department ranked first in the nation in grant support from various national agencies.

Although her schedule remained tremendously busy with the tasks of administrator, researcher and teacher, Dr. Cassell focused on trainees and the graduate teaching programs of the department. As an outcome of her interaction with trainees, she established the Annual Microbiology Research Retreat. She wanted the retreat to serve as a learning ground for students and to bring students, postdocs, and faculty together to interact both scientifically and socially. She believed that the retreat was a safe environment in which students could learn and enhance oral and poster presentation skills.

When Dr. Cassell left UAB in 1997, friends, colleagues, and members of the Department of Microbiology established the Gail H. Cassell Scholarship Endowment, a permanent scholarship endowment in honor and appreciation of her leadership.

A portion of the awards given to trainees at the annual research retreat is made possible by the Gail H. Cassell Scholarship Endowment Award. Established in 1998, this award provides recognition to trainees who give outstanding poster and oral presentations during the retreats.

Stone and Akhrymuk Receive Hiramoto Travel Awards

Congratulations to Hiramoto Travel Award recipients: Sara Stone (Lund lab) who will travel to Stockholm, Sweden, this summer; and Ivan Akhrymuk (Frolova lab) who will travel to Austin, Texas, in May to attend the Positive Strand RNA Viruses Keystone Symposia.

The Hiramoto Travel Award honors the memory of Dr. Ray Hiramoto and provides travel assistance for graduate students to attend meetings, workshops and advanced courses offered by scientific societies and other organizations.

All Microbiology graduate students (defined as Ph.D. students with a primary Microbiology faculty member as a dissertation mentor) in good standing are eligible to apply for a Hiramoto Travel Award.

New Ebook Available Online

Roles of Lipids in Virus Assembly, edited by microbiology’s Jamil Saad, Ph.D., and co-edited by Delphine Muriaux, Ph.D., has been released by Frontiers Media SA.

The book is a compilation of articles that focus on key aspects of virus-membrane interactions during assembly and egress, especially those of retroviruses and Ebola virus (EBOV).

Follow us on Twitter — @UABMicrobiology

Our Twitter account is an easy way for faculty, trainees, and staff to keep up with department activities. If you have information to share via Twitter, send it to ero bson@uab.edu.
UAB Microbiology #25, Immunology #27 in 2016 Best Global Universities Ranking

The 2016 edition of the Best Global Universities issued by U.S. News & World Report ranks the University of Alabama at Birmingham 200th in the world and places UAB in the top 75 US universities.

UAB was highly ranked in three subcategories: 25 in microbiology, 27 in immunology and 50 in clinical medicine.

To see the entire list or learn more about specific criteria used in rankings, visit the official U.S. News rankings page.
Orihuela Lab Gets Hairy
Carlos Orihuela, Ph.D., and lab members Norberto Gonzalez-Juarbe, Ph.D. and Anukul Shenoy put away their razors and embraced their hair for the whole month of November. Why? “Well, men’s health is important and should be paid close attention to,” says Orihuela.

These men participated in No-shave November, an annual web-based, non-profit event focusing attention on cancer and raising funds to support cancer prevention, research and education.

The idea is for participants to embrace their hair, which many cancer patients lose, and let it grow wild and free. Then, at the end of the month, they donate the money they saved by not buying hair care products or getting haircuts.

Postdoctoral Scientists Numbers Declining
By Louis Justement, Ph.D.

The quality and quantity of biomedical research may be negatively affected if the number of postdoctoral fellows in the biomedical field continues to decline. According to microbiology professor Louis Justement, Ph.D., co-author of “Biomedical science postdocs: an end to the era of expansion” (Oct. 6, 2015, FASEB Journal online), the number of early-career scientists choosing to become postdocs has declined for three years in a row.

Postdocs along with graduate students comprise a majority of the research workforce in the biomedical sciences. A continued loss of postdocs without an alternative source of talented research personnel will slow our rate of progress. “We need to develop a steady-state model for the biomedical research workforce while maintaining the vitality and excellence of the enterprise,” explains Justement.

*Submit information for the newsletter via email to Ella Robinson at erojbson@uab.edu.
Saini Receives Young Investigator Award

Congratulations to Dr. Vikram Saini who was awarded a Young Investigator Award at the 22nd Annual Meeting of the Society for Redox Biology and Medicine (SFRBM) held in Boston, November 18-21, 2015.

The SFRBM Young Investigator Awards are given for outstanding originality and conceptual novelty of the presentation in both oral or poster symposia. Saini was awarded for his work in identifying a role for host-derived intracellular hydrogen sulfide in tuberculosis disease and pathogenesis.

Public Defenses

Lindsey E Padgett
“NADPH Oxidase-Derived Superoxide: A Potentiator of Autoimmune Responses in Type 1 Diabetes”
October 30, 2015 | 1:00 p.m.
Committee: Hubert M. Tse, Ph.D.—Chair/Mentor
Robin Lorenz, M.D., Ph.D.; David D. Chaplin, M.D., Ph.D.; Kathryn Haskins, Ph.D.; Chad Steele, Ph.D.; Casey Weaver, M.D.

Mikhail Pavlenok
“The MspA nanopore as a sensor for DNA sequencing”
October 30, 2015 | 1:30 PM
Committee: Michael Niederweis—Chair
Kevin L. Kirk, Ph.D.; Peter E. Prevelige, Ph.D.; David A. Schneider, Ph.D.; Charles L. Turnbough, Ph.D.

Tyler Wright
“C-reactive protein, autoimmunity, and inflammation in the central nervous system”
October 23, 2015 | 10:00 AM
Committee: Alexander J. Szalai, Ph.D.—Chair/Mentor
Scott R. Barnum, Ph.D.; Khurram Bashir, M.D.; Peter H. King, M.D.; Hubert M. Tse, Ph.D.

Xiaojiao Xue
“Nonsense Suppression in a CFTR Mouse Model and Analysis of the Amino Acids Inserted at the CFTR Premature Termination Codons in Mammalian Cells”
Friday, October 23, 2015 | 2:00 PM BBRB 170
Committee: David M. Bedwell Ph.D.—Mentor
Zsuzsanna Bebok, Ph.D., Robert Kesterson, Ph.D., Kevin Kirk, Ph.D., Steve Rowe, Ph.D.

Qing Zhao
“Intestinal microbiota and its role in mucosal and systemic immune responses”
Thursday, October 29, 2015 | 200 p.m.
Committee: Charles O. Elson, M.D. – Mentor
Robinna G. Lorenz, M.D.; Dr. Casey T. Weaver, M.D.; John F. Kearney, Ph.D.; John D. Mountz, M.D., Ph.D.


Neubauer J, Ogino M, Green TJ, Ogino T. Signature motifs of GDP polynucleotidyltransferase, a nonsegmented negative strand RNA viral mRNA capping enzyme, domain in the L protein are required for covalent enzyme-pRNA intermediate formation. Nucleic Acids Res. 2015 Nov 23. [Epub ahead of print]
Publications
continued from page 9


Walter MR. Elucidating new drug targets in psoriasis by gene profiling: an opportunity to be seized. Ann Transl Med. 2015. PMID: 25992377


Kearney, John F
Juvenile Diabetes Research Foundation International Analysis of Human and Mouse Antibodies to Beta Cell Antigens Bearing N-Acetyl Glucosamine Post-Translation Modifications and their Potential to Prevent Human Type 1 Diabetes

Lund, Frances E.
United States - Israel Binational Science Foundation The Mechanism Whereby CD38 Deficiency Inhibits Alzheimer's Disease Pathology in a Mouse Model

Niederweis, Michael E.
National Institute of Allergy and Infectious Diseases/NIH/DHHS The Necrosis-Inducing Toxin of Mycobacterium Tuberculosis

Orihuela, Carlos J.
National Institute of Allergy and Infectious Diseases/NIH/DHHS Cardiac Microlesion Formation during Invasive Pneumococcal Disease
**Red Shoe Run 2016**  
Benefitting: Ronald McDonald House  
January 23, 2016 / 7:30-11:00am  
Rosewood Hall at Soho Square  
2850 19th Street South  
Homewood, AL 35209  
10 mile: $45 (late registration fees apply)  
5k: $30 (late registration fees apply)  
1 mile fun run: $20

**Repticon Birmingham**  
February 13 / 10:00 am to 5:00 pm  
February 14 / 10:00 am to 4:00 pm  
Zamora Shrine Temple  
Admission: Adults - $10, Children (5-12) - $5, Under 5 - Free.  
2-day and VIP tickets available.

Repticon Birmingham features two days of reptile fun, with over 100 tables of top-quality reptiles, amphibians, exotic pets and pet products, hourly seminars and presentations, door prizes sponsored by Exo Terra, and more!

**Birmingham Home and Garden Show**  
February 18 - 21, 2016  
Birmingham-Jefferson Convention Complex  
Adults-$11; children 5 and under-free

Four days of lively presentations by local and national home and garden experts. The topics will relate to remodeling, home improvement, gardening, landscaping, DIY, home décor, and more.

**Alabama 4H: Herp Journey**  
March 24, 2015 / 4:00pm  
Springville Road Regional Library  
1224 Old Springville Road  
Birmingham, AL

Join the Alabama 4H Science School for an afternoon of hands-on-fun as they introduce some of Alabama’s most famous reptiles—turtle, snake, gator, and more, oh my!

**Polar Plunge for Special Olympics**  
January 30, 2016 / 8:00 am  
Minimum $50 registration fee  
Oak Mountain State Park

Come out and take a plunge with the Alabama Law Enforcement Torch Run for Special Olympics. There will be a costume contest prior to the plunge. All plungers will receive a T-Shirt. The more money you raise, the cooler the swag you receive! All the money raised supports Special Olympics Alabama, devoted to sports training and competition for children and adults with intellectual disabilities.

**Birmingham Art Crawl**  
February 4, 2016 / 5:00-9:00 pm  
Downtown Loft District,  
2212 2nd Avenue N

Every first Thursday from 5:00–9:00 pm, rain or shine, Birmingham transforms into a walking art gallery full of artists, performers, food and fun! Meet local artists

**UAB Women’s Basketball vs FIU**  
March 3, 2016 @7:00-9:00pm  
Tickets: $5 admission / $3 youth (ages 3-17) Children age two and under are admitted free.  
UAB Students get in free with valid UAB student ID.  
Group Rates available at 205-975-8221  
Tickets may be purchased at the front door of Bartow Arena as early as one hour before tipoff on game day.