

UAB SCHOOL OF MEDICINE

Department of Microbiology

UAB Microbiology vs TB

Tuberculosis (TB) infects more than 1/3 of the world's population. It is among the top three causes of death for women aged 15 to 44, and people with weakened immune systems are at particular risk.

"Although drugs are available to treat infected individuals, multi-drug resistant, extensively drug-resistant and totally drug-resistant strains of TB are becoming a serious public health issue worldwide," explains Dr. Frances Lund, chair of the UAB Department of Microbiology. "New drugs that can be used to treat this devastating infectious disease need to be developed."

With this urgent need in mind, UAB Microbiology Department faculty, students and extended family are fighting TB in innovative ways.

Developing New Strategies

Dr. Michael Niederweis and his lab work on the bacterial pathogen *Mycobacterium tuberculosis* (Mtb), the causative agent of TB. They have identified a new pathway that prevents the TB bacteria from taking up the essential mineral iron from its environment. This leads to iron deficiency in the bacteria and the accumulation of toxic iron binding proteins (siderophores) in the bacteria. Their research shows that blocking the iron recycling pathway in TB delivers a one-two punch to the bacteria by restricting access to an essential mineral and by causing the accumulation of toxic proteins in the bacteria. (Read about this study in the February 14, 2014 issue of [Proceedings of the National Academy of Sciences USA](#).)

Dr. Andries Steyn works with tuberculosis through his joint appointments at the KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH) in Durban, South Africa and the UAB Department of Microbiology. K-RITH is a basic

research institute located in the middle of the TB epidemic, and Steyn was the first investigator to join the staff there. Through his unique position, Steyn is able to send US researchers to South Africa and South African researchers to the US, each receiving valuable training.

Expanding Awareness

The microbiology department's extended family is in the fight also. As faculty and students move to other positions outside of UAB, they take the knowledge they gain and build on it, adding new insight and strength to the battle against TB.

Dr. Gail Cassell, former chair of the UAB Department of Microbiology, worked at Eli Lilly and Company from 1997 until her retirement in 2010. There she established and led the Lilly TB Drug Discovery Initiative. She continues to work promoting collaboration and open scientific sharing among the less developed nations of the world where TB is most prevalent. In the last few years, Cassell has traveled to Russia, China, Kazakhstan and South Africa, communicating the importance of TB research. "TB," Cassell said, "has taken me to the ends of the earth."

Dr. Bill Jacobs, currently a professor of immunology, microbiology and genetics at the Albert Einstein College of Medicine in New York City, received his Ph.D. in molecular cell biology at UAB. The knowledge he gained at UAB has created a firm foundation for his continuing study of Mtb. He has developed genetic approaches to make mutations and transfer genes in *Mycobacterium tuberculosis* that led to the development of novel chemotherapies, vaccines and diagnostic tests to treat

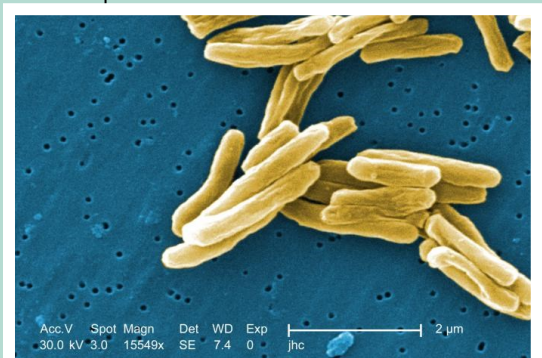
tuberculosis. Jacobs, a prominent researcher in the field, is known as the "TB Terminator." He was elected to the National Academy of Sciences in 2013.

Working Together

UAB researchers who focus on Mtb understand the value of working together and sharing knowledge and techniques with fellow researchers. The first South-eastern Mycobacteria Meeting, held in 2006, was hosted by researchers at UAB. It was the beginning of a platform for communication and collaboration between mycobacteria researchers and clinicians in the Southeast.

Now, eight years later, nearly 100 researchers attended the 5th Southeastern Mycobacteria Meeting, held again at UAB. Attendees included primary investigators, postdoctoral scholars, medical professionals, graduate and undergraduate students interested in basic biology, epidemiology or clinical aspects of mycobacteria and mycobacterial diseases.

As multi-drug resistant, extensively drug-resistant and totally drug-resistant strains of TB are becoming a serious public health issue worldwide, faculty and students in the UAB Department of Microbiology are serving up one-two punches to knock out TB.



Ming Luo Retires After 25 Years

Ming Luo, Ph.D., joined the microbiology faculty in 1987, after receiving his Ph.D. from Purdue University. He became full professor in 1996.

While at UAB, Luo's work on Theiler's virus, revealed how the virus was assembled, and its homology to other picornaviruses. He also worked on the matrix protein (M1), NS2, and neuraminidase of influenza virus, and developed neuraminidase inhibitors that are now marketed as antiviral drugs. He played a key role in developing the structural genomics pipeline for solving structures from *C. elegans* genome. He solved crystal structures of proteins from vesicular stomatitis virus (VSV) and worked on the cryoEM structure of VSV particle.

"We will miss having Ming here at UAB," says Frances Lund, Ph.D., chair of the UAB

Department of Microbiology. "He is an incredible scientist, a great mentor and a wonderful colleague."

Luo's retirement from UAB will allow him to begin a lab at Georgia State University, where he will be closer to many of his collaborators and co-investigators.

"It has been great many years working at UAB. I certainly will miss being here and miss all my colleagues," says Luo.



Congratulations to Colin Reily, a Post-doctoral Fellow in Microbiology, who received an award on a T32 Training grant in Nephrology (Dr. A. Agarwal, PI) to continue his studies concerning production of autoantigen in IgA nephropathy.

New Staff in Novak Lab

Barbora Knoppova, a volunteer and visiting PhD student in Microbiology, focuses on glycoproteins in autoimmune and infectious diseases. Barbora is from Palacky University in Olomouc, Czech Republic.

Karen Hart, a Research Specialist in Nephrology, recently joined Drs. Julian, Novak, and colleagues to work on clinical aspects of IgA nephropathy.

Yoshimi Ueda, a volunteer and visiting scientist in Microbiology, studies several aspects of IgA nephropathy. Yoshi is a nephrologist and researcher at the Jikei University School of Medicine, Tokyo, Japan.

Department Events

(All seminars are in BBRB 170 at noon unless otherwise specified.)

October 7, 2014

Special Seminar - Faculty Recruit Seminar

Presented by: [James Brien, Ph.D.](#)

[Washington University School of Medicine, St. Louis, MO](#)

October 9, 2014 (Special time 4pm BBRB 170)

Special Seminar - Faculty Recruit Seminar

Presented by: [Amelia Pinto, Ph.D.](#)

[Washington University School of Medicine, St. Louis, MO](#)

October 16, 2014

Special Seminar (*Sponsored by UAB Center for AIDS Research*)

Presented by: [William \(Bill\) Jacobs, Ph.D.](#)

Department of Microbiology & Immunology, [Albert Einstein College of Medicine, Yeshiva University](#)

October 17-19, 2014

[Microbiology Research Retreat](#)

Joe Wheeler State Park

October 28, 2014

Microbiology Seminar Series (Co-sponsored by [The Center for Free Radical Biology](#)),

Presented by: [Lars Dietrich, Ph.D.](#), (Hosts: [Fran Lund/Jianhua Zhang](#))

[Department of Biological Sciences, Columbia University](#)

November 4, 2014

Microbiology Seminar Series

Presented by: [Margaret Kielian, Ph.D.](#), (Host: [Ilya Frolov](#))

[Department of Cell Biology, Albert Einstein College of Medicine](#)

November 11, 2014

Microbiology Seminar Series

Presented by: [Tamas Jilling, M.D.](#), (Host: [Beatriz Leon](#))

[Department of Pediatrics, Division of Neonatology, UAB](#)

For a complete list of department events, [click here](#).

Welcome

Brian Anderson – Research Technician (Tse Lab)

Bara Knoppova – Visiting Scientist, Novak Lab

Alicia Mejia – Research Technician (Tse Lab)

Mira Patel – Research Technician (Weinmann Lab)

Anna Stevens – Research Technician (Hu Lab)

Hairong Wei – Postdoc (Hu Lab)

Farewell

Meghan Ange – Laboratory Assistant, (M Luo Lab)

Anne Bet – Graduate Research Assistant
(Microbiology Graduate Program)

Leland Black – Graduate Student (Kabarowski Lab)

Heather Cossaboon, Student Assistant (Zajac Lab)

Robert Cox – Research Assistant (M. Luo Lab)

Justin Daigneault – Financial Officer II (Chair's Office)

Weiqi Lei – Research Assistant (Tse Lab)

Valeria Lulla – Postdoctoral Fellow (Frolov Lab)

Ming Luo – Faculty

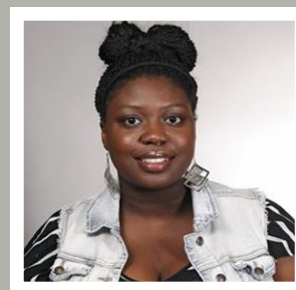
Jenna Pate – Program Coordinator II (Chair's Office)

Katarina Robert – Volunteer, Klug Lab (Swindle)

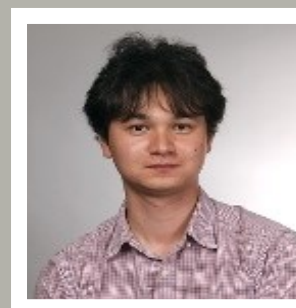
Jennifer Rowland – Research Associate (Niederweis Lab)

Ryan Wells – Postdoctoral Fellow (Steyn Lab)

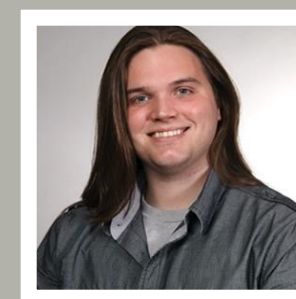
Welcome New Graduate Students!



Danielle Chisolm
Mentor: Dr. Amy Weinmann



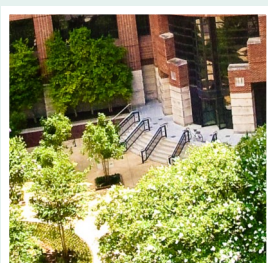
Ken Hough
Mentor: Dr. Amy Weinmann



Joshua Justice
Mentor: Dr. Mengxi Jiang

We're on the web:

<http://www.uab.edu/microbiology>



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Department of Microbiology**

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Useful Links

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[Employee Site](#)

[Microbiology Seminar Series](#)

[BBRB Conference Rooms Schedule](#) **New!**

[Giving Opportunities](#) **New!**

Public Defenses

Anne Bet

"Recognition of Human Immunodeficiency Virus Type I (HIV-1)
Cryptic Epitopes During Infection and Following Vaccination"

Wednesday, July 2, 2014 | 1:30 PM | BMRB 101

Mentor: Paul Goepfert, M.D.

Committee: Zdenek Hel, Ph.D.; Elliott Lefkowitz, Ph.D.;

Casey Morrow, Ph.D., Allan Zajac, Ph.D.

Leland Black

"The Modulation of High Density Lipoprotein Metabolism
in Systemic Lupus Erythematosus"

Friday, July 11, 2014 | 11:00 AM | BBRB 170

Mentor: Janusz H. Kabarowski, Ph.D.

Committee: GM Anantharamaiah, Ph.D.; Geeta Datta, Ph.D.;

Hubert M. Tse, Ph.D.; C. Roger White, Ph.D., Committee Chair

Emily Katherine Stefanov

"Modulation of the Immune Response to *Aspergillus fumigatus* by
Antibodies to Conserved Bacterial Polysaccharides"

Friday, September 12, 2014 | 2:00 PM | BBRB 170

Mentor: John Kearney, Ph.D.

Committee: Robin Lorenz, M.D., Ph.D.; David Chaplin, M.D., Ph.D.;

Hubert Tse, Ph.D.; Chad Steele, Ph.D.

Grant Awards | June 1 - August 31

Briles

PATH VACCINE SOLUTIONS

Eight Project Plan - VAC-010

National Institutes of Allergy and Infectious
Diseases/NIH/DHHS

*PspA Mechanisms of Humoral Immunity,
Functional Assays, and Optimal Vaccine
Constructs*

Mengxi Jiang

UAB Faculty Development Grant Program

*Mechanisms of Polyomavirus-induced Host
DNA Damage*

Klug

UAB IAT Research Acceleration Award

*Gene targeting in human hematopoietic
stem cells using novel cell-free conditions
that support human HSC expansion in vitro*

King

UAB IAT Research Acceleration Award

*The Development of Improved Methods for
Cloning and Expression of Human Antibod-
ies*

Kabarowski

UAB IAT Research Acceleration Award

*Mass Spectrometry Imaging for the study
of Lipid-based Immunomodulatory Mecha-
nisms*

Lund

ADDA

*Treating B cell-derived neoplasms by tar-
geting the ectoenzyme CD38: a regulator of
the NAD metabolic pathway*

Lund

UAB Diabetes Research Center (DRC) and UAB
Comprehensive Diabetes Center (UCDC)

*Controlling oxidative stress in beta cells by
modulating NAD metabolism*

Mestecky/Novak

NIH/NIDDK

*IgA Nephropathy: Interventions with Genera-
tion of Nephritogenic Immune Complexes*

Thompson

ADDA

*Development of an anticancer therapeutic
against ribosomal protein S25*

Tse

UAB IAT Research Acceleration Award

*In Vivo Detection of Immuno-Spin Trapped
Free Radicals*

AAI Travel for Techniques Award

Zajac, Allan

National Institutes of Allergy and Infectious
Diseases/NIH/DHHS

*Regulation of T Cell Activity During Chronic
Infections*

Publications | July 1 - September 30

Ballesteros-Tato A, **León B**, Lee BO, **Lund FE**, Randall TD. Epitope-specific regulation of memory programming by differential duration of antigen presentation to influenza-specific CD8(+) T cells. *Immunity*. 2014 Jul 17;41(1):127-40. doi: 10.1016/j.immuni.2014.06.007. PMID: 25035957

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Kim DY, Atasheva S, McAuley AJ, Plante JA, **Frolova EI**, Beasley DW, **Frolov I**. Enhancement of protein expression by alphavirus replicons by designing self-replicating subgenomic RNAs. *Proc Natl Acad Sci U S A*. 2014 Jul 22;111(29):10708-13. doi: 10.1073/pnas.1408677111. Epub 2014 Jul 7. PMID: 25002490

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Kubagawa H, Kubagawa Y, Jones D, Nasti TH, **Walter MR**, Honjo K. The Old but New IgM Fc Receptor (Fc μ R). *Curr Top Microbiol Immunol*. 2014;382:3-28. doi: 10.1007/978-3-319-07911-0_1. PMID: 25116093

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León B, Ballesteros-Tato A, **Lund FE**. Dendritic Cells and B Cells: Unexpected Partners in Th2 Development. *J Immunol*. 2014 Aug 15;193(4):1531-1537. Review. PMID: 25086176

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Mestecky J, **Novak J**. Differential glycosylation of envelope gp120 is associated with differential recognition of HIV-1 by virus-specific antibodies and cell infection. *AIDS Res Ther*. 2014 Aug. 11:23. PMID: 25120578

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Med Hyg. 2014 Sep;108(9):591-3. doi: 10.1093/trstmh/tru098. Epub 2014 Jul 7. PMID: 25002461

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Around Campus and About Town

UAB Blazer Football

10/04/14	at Western Kentucky *	Bowling Green, Ky.	6:00 p.m. CT
10/11/14	vs. North Texas * 	Legion Field	2:30 p.m. CT
10/18/14	at Middle Tennessee * 	Murfreesboro, Tenn.	2:30 p.m. CT
10/25/14	at Arkansas	Fayetteville, Ark.	TBA
11/01/14	at Florida Atlantic * 	Boca Raton, Fla.	6:00 p.m. CT
11/08/14	vs. Louisiana Tech * 	Legion Field	11:00 a.m. CT
11/22/14	vs. Marshall *	Legion Field	12:00 p.m. CT
11/29/14	at Southern Miss * 	Hattiesburg, Miss.	2:30 p.m. CT

UAB Opera

November 20, 2014 to November 21, 2014
Alys Stephens Center, Sirote Theatre

UAB Opera presents "The Elixir of Love" by Donizetti (sung in English), directed by Kristine Hurst-Wajszczuk. Call 205-975-2787 for ticket information.



An Elf Tale

November 24, 2014
to December 19, 2014
Birmingham Jefferson
Convention Complex



Family Day Performances: Saturday, December 6 and 13, 2014 at 10:00am & 12:00pm Sunday, December 7 and 14, 2014 at 2:00pm School Day Performances: November 24 & 25, 2014 at 9:30am & 11:00am December 1-19, 2014 at 9:30am & 11:00am

Antiques at The Gardens

October 2-5, 2014
Birmingham Botanical Gardens
Admission \$10

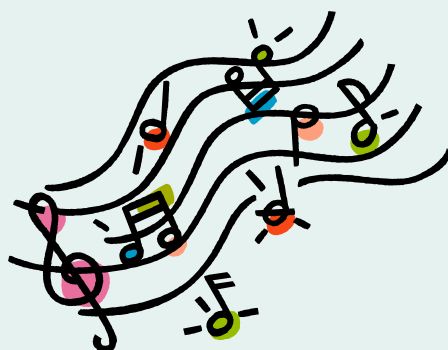
Featuring Tastemakers with curated areas and dozens of national dealers specializing in art, jewelry and modern and vintage decor.



Alabama Butterbean Festival

October 3-4, 2014
Friday 6:00pm til 10:00pm
Saturday 8:00am til 4:00pm
Historic Downtown Pinson

Music, Food, Arts and Crafts,
Rides, Friday Night Fireworks



The 37th Annual Birmingham Boys Choir Christmas Concert

December 02, 2014

The 37th Annual Birmingham Boys Choir Christmas Concert rings in the holiday spirit with carols sung by the beautifully trained voices of the boys ages 8-18. The concert begins at 7:30 pm. Admission is free.

