

The Vulcan Letter

Voice of the MSTP at UAB

June 27, 2015

Message from the Director

by Robin Lorenz, MD, PhD



Last year, my update was written immediately after the NIH/NIGMS site visited Birmingham and the UAB MSTP. Every one of you participated in this review in some way, either by talking with the site visitors, by updating your student bios (multiple times), by publishing excellent research, and by just being a part of this great program. Now, a year later, we finally know that our MSTP T32 grant has been renewed and was even expanded and I want to say THANKS to each of you for all of your efforts. I fully believe that our new incoming students decided to come to the UAB MSTP in a large part because of the involvement of our current students in the program. Please join with me in welcoming our new students and in helping to make them feel a part of the UAB MSTP family.

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Summer Happenings in the 'Ham *Activities Abound Outside the Lab in the Magic City*

by Paige Souder

While 100 degree days on the regular can be rather unforgiving in the South, Birmingham does offer several summery activities to keep things cool.

The premiere event of this summer is Sloss Fest, a indie/pop/alternative music festival at Sloss Furnace downtown July 18-19 that is sure to deliver. Headliners Modest Mouse, Avett Brothers, and Cage the Elephant, among other great artists, are

bringing the music festival scene to Birmingham in style—definitely earning us some street cred. Grab your single day pass or weekend pass today (if you haven't already) and get ready to grab a drink, hear some rad tunes, and even watch a live iron-pouring demonstration.

If music isn't your thing, there are plenty of other avenues for enjoyment. Outdoor enthusiasts can head over to Oak Mountain State Park to mountain bike, trail run, paddle board, kayak, fish, or just hang



Major music headliners are set to invade Birmingham this summer at Sloss Furnace
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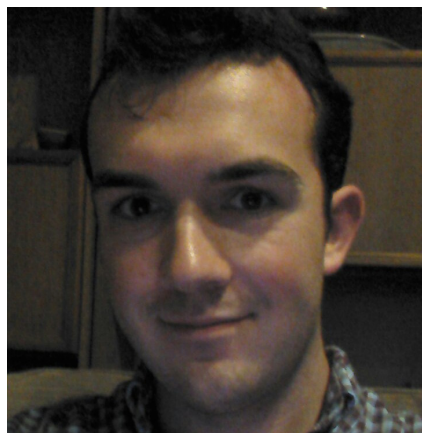
Welcome to the Class of 2023!

Dewey Brook



Dewey Brooke attended Montana State University in Bozeman, Montana, where he received a bachelor's degree in physics in 2012. During his time at Montana State, Dewey performed research focused on the biophysical and biochemical characterization of receptor binding by parvoviruses. After graduating from MSU, Dewey Brooke worked in the Prevelige laboratory here at UAB, where he used mass-spectrometry to study the structure of several HIV proteins. In the past, Dewey served as a member of the Montana State Undergraduate Chemistry Society, and was also active in several STEM outreach groups.

Graham Cochrane



Graham Cochrane graduate from Elon University this past May with a degree in neuroscience. As an un-

dergraduate, Graham performed research at Elon University, Duquesne University, and Brown. His work at these institutions ranged in focus from the genetics of concussion susceptibility, to the prevalence of internal tremor in patients of Parkinson's disease.

Graham's current research interests remain heavily tied to neuroscience, and in particular how genetics underlie certain behavioral changes. As a result, he chose to attend UAB due to the strength of its neuroscience program. Outside of the laboratory, Graham has served as a genetics tutor, a counselor at several youth outreach camps, and as treasurer of his university's neuroscience club.

Emma Dean



Emma Dean completed her undergraduate studies at Emory University in 2011 where she majored in accounting. Since then, Emma has been working under Rich Meyers of Hudson Alpha on aspects of the ENCODE project, as well as on a study examining the genetic underpinnings of intellectual disability. She hopes to continue to use the power of genomics to investigate the etiology and mechanism of disease as an MSTP student at UAB, and is spe-

Compiled by Alexander Bray

cifically interested in the work of Casey Weaver. Outside of the lab, Emma has taken part in a wide array of volunteer work, is a licensed CPA, and speaks fluent Russian.

Asher Krell

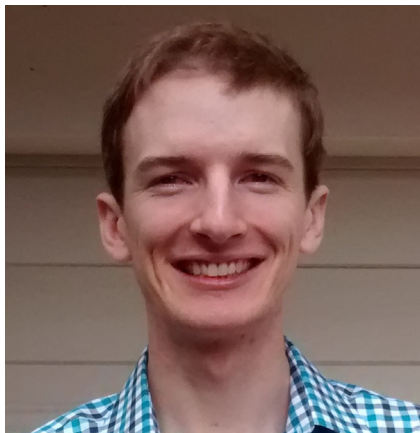


A native of the Forest Park neighborhood in Birmingham, Asher Krell attended Columbia University where he received a bachelor's degree in chemical engineering this past May. As an undergraduate, Asher worked under the chief technology officer of the biotech company Abaxis on the research and development of lateral flow diagnostic devices. Asher also served as an undergraduate research assistant under Eben Rosenthal here at UAB, where he aided in the research of novel antibodies for the imaging of head and neck cancer.

Asher is currently interested in biomedical engineering, and was drawn to UAB due to the strength of its BME program and its research into small scale capillary models through growth of endothelial cells on collagen matrix. Outside the lab, Asher has been an volunteer for several service projects and summer camps.

Incoming MSTP Students, continued

Ryan McMonigle



Ryan McMonigle graduated from University of California-Irvine in 2012 with a bachelor's of science after majoring in chemistry. Following graduation, he stayed on at UCI and served as a lab manager under Dr. Aimee Edinger. As part of the Edinger Lab, Ryan worked on several projects focused on how loss of the TSC2 gene affects cellular metabolism. Ryan's current research interests remain closely tied to cancer metabolism, and he is particularly interested in novel therapeutics based on the targeting of metabolic differences between cancer and "normal" cells. Outside of the lab, Ryan enjoys running, and actually competed as a D1 athlete for UCI in cross country.

Patrick Molina



Originally from Los Angeles, Patrick Molina completed his undergraduate studies at Georgia Southern University, where he majored in chemistry and graduated in 2010. As an undergraduate he performed research on the DNA cleaving activity of photo-activated transition metal porphyrin ring systems (PRS).

After graduation, Patrick was part of several research projects at Emory University, where he studied the pathogenesis of atherosclerosis and diabetic nephrogenic diabetes insipidus. In addition to his own work in the laboratory, Patrick has served as a research mentor for undergraduates, and as a volunteer and translator for the Good Samaritan Medical Clinic. He also enjoys cooking, playing basketball, and spending time with his wife, Lauren.

Hayden Pacl



Haden Pacl majored in psychology at the University of Arkansas, where he graduated this past May. As an undergraduate, Hayden took part in several research projects on the UARK campus. These studies ranged in focus from biochemical analysis of Staphylococcus nuclease proteins, to neuroscience projects focused on understanding what brain regions are involved during

the acquisition of different behaviors. Outside of the lab, Hayden is involved in several volunteer projects at both the University of Arkansas and in Costa Rica. He is also an avid cyclist, and was a member of the Arkansas club cycling team.

Jacelyn Peabody



Jacelyn Peabody attended Carthage College in Kenosha, Wisconsin, where she received a bachelor's degree in neuroscience this past May. During her time as an undergraduate, Jacelyn took part in a diverse array of research projects at Carthage College, the University of Minnesota, and at Johns Hopkins. These projects ranged in focus from the study of the function of the amygdala in PTSD, to the pathogenesis of pulmonary hypertension, to the role of macrophages in cystic fibrosis.

Jacelyn hopes to continue to study cystic fibrosis as an MSTP student, and was actually drawn to UAB for its Gregory Fleming James Cystic Fibrosis Research Center. Jacelyn is also excited to come to UAB because the South is the only area of the United States in which she has not yet lived. Outside of the laboratory Jacelyn served as presi-
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Congratulations to the Class of 2015!

Compiled by Alexander Bray

Abdurrahman Elkhetai



Dr Abdurrahman Elkhetai received his Ph.D. through the Department of Neurobiology. His thesis work, titled “Modulation Of Intrinsic Activity In Sensory Cortex Facilitates Task Performance”, made use of functional Magnetic Resonance Imaging (fMRI) to study how different areas of the brain’s visual cortex are involved in the initiation and maintenance of a task set. Abdurrahman is currently headed to the University of Utah, where he matched in neurology. He chose to specialize in neurology because of his fascination with the brain, and for its obvious relevance to his research interests. Above all, Abdurrahman advises trying to understand as quickly as possible what medical specialty is right for you, because you can’t begin the residency application process until you do. To help facilitate this process, Abdurrahman recommended choosing electives wisely in order to rule in and rule out possible specialties of interest.

Vishnu Cuddapah

Dr Vishnu Caddapah’s dissertation work, titled “Regulation of CIC-3 in Human Malignant Glioma”, ex-

amined the role and regulation of chloride channels in glioma cells. He received his Ph.D. through the Department of Neurobiology and is now enrolling in the child neurology residency program at Children’s Hospital of Philadelphia. Vishnu chose this specialty due to its applicability to his research interests, and chose CHOP for its renowned reputation in the field of pediatrics.



Like Dr. Abdurrahman Elkhetai, Dr. Vishnu Cuddapah recommends trying to discover what medical specialty is right for you as early as possible. He believes knowing is necessary for effective scheduling of your 4th year clerkships and vacation time. The vacation time, Vishnu argues, should line up with when your programs of interest begin to interview candidates. This not only allows you to optimize your interview plans during points of limited clinical work, but also keeps you from interviewing at programs too late in the process, which can be interpreted by programs as a lack of interest on your part. Vishnu also strongly believes in listening to the individuals on UABs campus who are designated as advisors for students interested in certain specialties. He believes their help is crucial for effectively planning for the interview process.

David Gaston



Dr. David Gaston received his Ph.D. through the Cell, Molecular and Development Biology Program for his thesis work entitled “Potential Roles of the Immunostimulatory Signals IL-15 and MICA in Oncolytic HSV-1 Therapy for Malignant Glioma”. David’s dissertation research was focused on optimizing the efficacy of oncolytic therapy for treatment of gliomas. David matched into the Internal Medicine Residency Program at the University of Utah.

Like Vishnu, David advises making use of the advisors on UABs campus when it comes to applying for residency. However, he warns that some advisors are better than others, and that you should never take one person’s word as absolute truth. In addition, he also warned that for many of the competitive residencies, simply having a Ph.D. is not enough, you still need very good medical school grades and board scores. Finally, David also advised to make use of connections established at scientific conferences, and believes the people you meet at these functions may be the difference between you being accepted or rejected from a program of interest.

Departing MSTP Students, continued

Jennifer Hadley



Dr Jennifer Hadley's thesis work, titled "Imaging Biomarkers for Prediction of Treatment Response in Schizophrenia", made use of function Magnetic Resonance Imaging (fMRI) and novel techniques based on graph theory/social network analysis to study how individuals respond to antipsychotic drugs. Following completion of her project, Jennifer received her graduate degree through the Biomedical Engineering Ph.D. Program and matched in the Psychiatry Residency Program at UAB. Jennifer ultimately chose to stay at UAB due to the strength of its psychiatry program, and to stay close to her fiancée, Sean Hicks, who currently works as a lawyer in the Birmingham area. In terms of advice for future residency applicants, Jennifer stresses not returning to medical school from the laboratory in January. She believes this leaves you too little time to decide on your future specialty, and puts you too far behind the other medical students to make a good impression. She thought it would be manageable by doing study questions herself before returning to the wards, but says she found out quickly that this doesn't match the level of education you experience seeing patients first hand.

Stacy Watkins

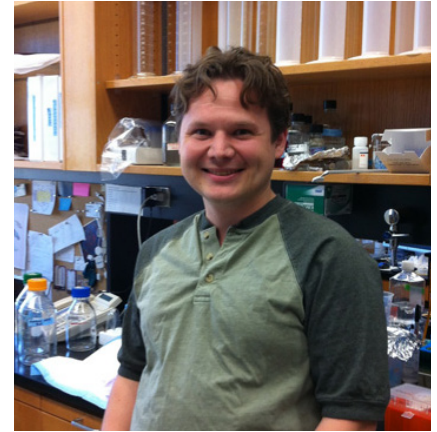


Dr. Stacy Watkins received her Ph.D. through the Department of Neurobiology for her thesis work on the biophysical and biomechanical aspects of glioma cell migration within the confined spaces of the brain. For residency, Stacy matched into internal medicine at UAB. Stacy ultimately chose UAB after experiencing first-hand the high quality of teaching and mentorship here as a medical student. She graduated from UAB feeling that the attendings were truly dedicated to teaching the residents and furthering their careers, and she felt compelled to stay in that environment. Additionally, she hopes to match into a fellowship in the future, and as a result staying at a strong academic institution like UAB was a necessity. Other key factors were the diversity of the patient population, association with a VA institution, and a great comradery between residents.

In terms of advice, Stacy strongly believes in listening to the advisors at UAB. She also strongly believes that it is important to remember that residency application is very different than applying to medical school. Unlike medical schools, residency programs are actively courting you. Stacy says reminding herself of this

throughout the process helped her from becoming too stressed.

Nicholas Reish



Dr Nicholas Reish's thesis work, titled "Rhodopsin Trafficking and Retinal Function", was centered on using the model organism *Xenopus laevis* in order to studying trafficking of the dim light photoreceptor protein rhodopsin. Nicholas received his Ph.D. through the Department of Neurobiology and matched into the Neurology Residency Program at the University of Iowa.

Dr. Reish has a plethora of brutally honest pieces of advice for future residency applicants. First, he strongly advises having a strong backup plans if you are applying for highly competitive residencies like ophthalmology and urology. Fortunately, because these are early matches and therefore interview earlier, you can feasibly apply and interview for residencies in two different medical specialties. Furthermore, he also strongly stressed the importance of "playing the part" during residency interviews. Although in theory how well tailored your suit is and the specific ways you act during conversation shouldn't matter when it

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Director's Welcome, continued

We have several significant changes that either already have occurred or will be soon occurring. First, as you all have heard, the Graduate School has approved a stipend increase for all students. Therefore, those of you who have been admitted to candidacy will now make \$30,000 per year, and those of you prior to candidacy will make \$29,000 (as of August 1). Any student with an external individual fellowship that covers more than 50% of their stipend will get an additional \$1500 for the duration of the grant award. A second change is in the Fall curriculum of the UASOM. Fundamentals 1 and 2 have been combined into a new single course (Fundamentals) with five individual content-related blocks. It will be completely P/F with no P1-P4 ranking. The bigger picture is that MS1-MS2 years will be P/F, with no attendance requirements. Honors will be given at the end of Yr2. MSTP students will be required to take the full Fundamentals course, as well as the new (in Fall 2014) MSTP specific course (MSTP 793 – Basic Science Research Form). This course will again be taught by Dr. Jennifer Pollock and will substitute for GBS 707/708/709. In addition, the GBS will be lengthening GBS 707/708/709 and this will mean that no theme-specific coursework for MS2 MSTP students will start before the Spring semester.

I want to also say congrats to the following MSTP students who received individual NIH F30/F31 awards this year: Jeff Singer (NIDDK), Alexander Bray (NHLBI), Brandon Fox (NIDDK), Jonathan Lockhart (NHLBI), and David Figge (NINDS)

Two of our students got perfect scores, a pretty amazing accomplishment and certainly their grants will be useful reading for student submitting individual fellowship grants in upcoming years. I also want to congratulate the 2010 entering MSTP class. This was the first group of students who were required to submit individual F30/F31 grants and they did a fantastic job, as 57% of the class was awarded a F30/F31. This is certainly a great goal for future classes to achieve or surpass.

I also thought you might like to see a few numbers from the most recent recruiting season.

2014-2015	Number of Applicants	M/F	States Represented	Average MCAT	Average GPA
All Applicants	207	139/68	38	32 (13-41)	3.62 (2.22-4)
Applicants Interviewed	47	29/18	22	34 (27-39)	3.76 (2.91-4)

Thanks to everyone for your involvement in recruiting our new 2015 class (who are introduced in this newsletter). We welcome any and all feedback about the recruitment process and about the program in general.

-Robin Lorenz, MD, PhD
MSTP Director, University of Alabama at Birmingham

Departing MSTPs, Cont'd

comes to identifying successful future physicians, Nicholas believes these things make a huge difference during the interview process. Finally, one aspect of interviews which took Nicholas by surprise was how little many of the interviewers knew about you. Nicholas advises going into each interview believing that the person across from you hasn't read a single word of your application, which is what Nick felt was actually the case the vast majority of the time.

Sini Nwaobi



Dr Sini Nwaobi received her Ph.D. through the department of neurobiology for her thesis work entitled "Epigenetic regulation of Kir4.1 in normal and pathological states: a focus on spinal cord injury". Her research was largely focused on understanding how DNA methylation in glial cells influences normal development of the central nervous system through regulation of the Kir4.1 potassium channel.

Sini matched in the child neurology program at UCLA, her first choice. She ultimately picked this specialty because of the lifestyle and various opportunities to continue research. She also appreciated that it is a *continued on page 9*

Summer Events, Cont'd

with your pup. Look out for free stand-up paddleboard classes offered by Mountain High Outfitters throughout the summer.

Those who would rather sit back and relax may want to check out free outdoor movie screenings at Avondale Park offered every couple of weeks. The perfect excuse to grab some Saw's BBQ and an Avondale brew and enjoy the slightly cooler summer night. Railroad Park, within walking distance of UAB, also offers free exercise classes Monday-Friday and the perfect picnic spot any day of the week.



Railroad Park has received national recognition for helping revitalizing the city of Birmingham

And finally, for you true Americans who enjoy the great sport of baseball, and also those of you who enjoy \$0.50 hot dogs or \$2 beer, head across the street to Regions Field for a Barons game. Food/drink specials during the week, firework Fridays, and baseball pants make this a must-do Birmingham summer activity. So, stay hydrated, slather on some sunscreen, and enjoy some summertime fun, Birmingham style.



Come cheer on Birmingham's hometown team at Region's Field

Student Spotlight

Jennifer Stanley (GS4)



PARP inhibitors are a class of drugs developed to treat cancers in which an underlying DNA repair defect is present, as in the case of cancers caused by BRCA1 and BRCA2 mutations. However, a recent study published by Eddie Yang here at UAB suggested that PARP inhibitors may also hold promise for treating other forms of cancer, specifically Her2/neu positive breast cancer. Within this cell population, PARP was found to act via a newly discovered NF-kB mediated mechanism to promote cancer progression in vitro and in a mouse model of Her2+ breast cancer.

Recent work by Jennifer Stanley has no built on these findings by documenting for the first time evidence of this alternative form of PARP mediated cancer progression in human tissue samples. Outlined in a recent publication in Breast Cancer Research and Treatment, Stanley et al. examined protein levels of PARP and P65, the activated NF-kB subunit, in 407 primary human breast cancer samples. Intriguingly, the findings from this paper support the earlier publication from the Yang lab, and demonstrate that Her2 positive cells do display significantly elevated levels of PARP and p65 protein relative to Her2 negative cancers. Furthermore, the expression of PARP and p65 in these samples was significantly correlated with both one another and with increased tumor stage/grade, further supporting the concept that these two proteins are involved in a signaling cascade that is promoting tumor aggressiveness. Jennifer hopes that these findings will lead to PARP inhibitors undergoing clinical trials to evaluate their use as a salvage therapy for Her2 positive breast cancer patients which develop resistance to trastuzumab. Outside of the lab, Jennifer enjoys spending time with her daughter Amelia and taking solace in the fact that she no longer lives in Indiana.

ANNOUNCEMENTS



Congratulations to Alex Dussaq and Kelly Roszczyński who were recently married on May 30th! Best wishes for the happy couple!

Congratulations to Josh Cohen, Brandon Fox, and Kelsey Patterson on being GSRD Award Winners!

Congrats to Dr. Lorenz, a recent recipient of the President's Award for Excellence in Teaching in the School of Joint Health Sciences.

Congrats to Sushma Boppana on being selected as an IDSA Education and Research Foundation 2015 Medical Scholar!

Thesis Defense - Success!

Congratulations to **Dr. Travis Hull**, who defended his thesis in Immunology on May 13!

Congratulations to **Dr. Stephanie Robert**, who defended her thesis in Neurobiology on June 4th

Upcoming Events

Jennifer Stanley is scheduled to have her thesis defense on July 14th at 8:00 AM in HSROC auditorium



Incoming MSTP Students, continued

dent of the Nu Rho Sci National Neuroscience Honors Society. She has also served as leader of a book club for at-risk high school students, and dabbled in traditional Maya medicine during her time abroad in Nicaragua.

Kristin Olson

Kristin Olson received her bachelor's degree from UAB in 2011, followed by her MPH from UAB in 2012. During that time, she took part in several research experiences at UAB involving the analysis of focus group data at the 1917 Clinic as well as assessment of the risk of jaw osteonecrosis following bisphosphonate therapy. She has also spent time in industry, including a period of time where she worked with Applied Genomics on investigating potential biomarkers in breast cancer. After receiving her MPH, Kirstin enrolled in the Univer-

sity of Alabama School of Medicine and is now joining the MSTP as an advanced transfer. Kristin is excited to join the MSTP in order have the protected time to truly develop as a scientist and can't wait to work with the large data sets produced by the clinical and epidemiological research that takes place at UAB Medical Center.



Publications

Stanley J, Klepczyk L, Keene K, Wei S, Li Y, Forero A, Grizzle W, Wielgos M, Brazelton J, LoBuglio AF, Yang ES. PARP1 and phospho-p65 protein expression is increased in human HER2-positive breast cancers. *Breast Cancer Res Treat.* 2015 Apr;150(3):569-79.

Boddu R, **Hull TD**, Bolisetty S, Hu X, Moehle MS, Daher JP, Kamal AI, Joseph R, George JF, Agarwal A, Curtis LM, West AB. Leucine-Rich Repeat Kinase 2 Deficiency is Protective in Rhabdomyolysis-Induced Kidney Injury. *Hum Mol Genet.* 2015 Apr 22.

Bolisetty S, Zarjou A, **Hull TD**, Traylor AM, Perianayagam A, Joseph R, Kamal AI, Arosio P, Soares MP, Jeney V, Balla J, George JF, Agarwal A. Macrophage and epithelial cell H-ferritin expression regulates renal inflammation. *Kidney Int.* 2015 Apr 15.

Hull TD, Kamal AI, Boddu R, Bolisetty S, Guo L, Tisher CC, Rangarajan S, Chen B, Curtis LM, George JF, Agarwal A. Heme Oxygenase-1 Regulates Myeloid Cell Trafficking in AKI. *J Am Soc Nephrol.* 2015 Feb 12.

McCullumsmith RE, **Hammond JH**, Shan D, Meador-Woodruff JH. Postmortem brain: an underutilized substrate for studying severe mental illness. *Neuropsychopharmacology.* 2015 Mar 13;40:1307.

Cohen JL, Glover ME, Pugh PC, Fant AD, Simmons RK, Akil H, Kerman IA, Clinton SM. Maternal Style Selectively Shapes Amygdalar Development and Social Behavior in Rats Genetically Prone to High Anxiety. *Dev Neurosci.* 2015 Mar 17.

Departing MSTPs, continued

field that really values the PhD.

Sini advises working hard during the medical school clerkships. In addition, she stressed remembering that medicine is a service industry so good people skills and being a good team member gets you far. With regards to the match, Sini advises not letting any one or two negatives in your current package deter you from your specialty of choice. She believes you should be honest with what your negatives and positives are as an applicant in your field and

try to fill in those gaps with perhaps carefully chosen recommendation letters, courses, and by practicing interview/people skills.

Finally, Sini believes that returning to clinics, interviewing and matching is HARD, stressful, and leads to a lot of self doubt. She recommends surrounding yourself with people who understand what you are going through and support you, which may unfortunately not always describe your fellow MD/PhDs in the GS phases.

Brossier NM, Pechtl AM, Longo JF, Barnes S, Wilson LS, Byer SJ, **Brosius SN**, Carroll SL. Classic Ras Proteins Promote Proliferation and Survival via Distinct Phosphoproteome Alterations in Neurofibromin-Null Malignant Peripheral Nerve Sheath Tumor Cells. *J Neuropathol Exp Neurol.* 2015 Jun;74(6):568-586.

The Vulcan Letter

Contributors and Editorial Staff:

Alexander Bray
Paige Souder
Shima Dowla
Robin Lorenz, MD, PhD





MEDICAL SCIENTIST TRAINING PROGRAM

UAB Medical Scientist Training Program

1825 University Blvd, SHEL 121

Birmingham, AL 35294-2182

www.mstp.uab.edu