Medical Student Research Program – Full Option Application

Please develop this application with your mentor.

Send completed documents and final application in PDF form to Marjorie West (mwest@umc.edu) and your mentor by Monday, October 12, 2015. Incomplete forms, lack of additional documents, and deviations from the application formatting requirements may result in application denial.

ADDITIONAL DOCUMENTS TO BE SUBMITTED WITH APPLICATION

☒ Mentor NIH Biosketch ☒ Transcript ☒ Letter of Good Standing (Academic Affairs) ☒ Student CV

1. **Applicant Name** Johnny Lippincott
2. **Project Title** Identifying and Teaching Visual Attentive Behavior in a Test-Taking Model Using Eye Tracking
3. **Mentor Information**

   a. Mentor Name Ryan Darling, PhD

   b. Department Neurobiology and Anatomical Sciences

   c. Email rdarling@umc.edu

   d. Phone 601-984-1642

Funding Source(s)	☒None	☐ AHA	☐NIH	☐ Other
IRB/IACUC Approval	☐ Approved	☒Pending	☐N/A	
Protocol Name				
Protocol Number				

4. **Personal Statement (previous accomplishments, goals for MSRP, short-term career goals, long-term plans in academic medicine, etc.) Limit: 500 words.**

   Applying my curiosity to better understand the world around me has been a driving force since childhood up to my current study of medicine. The complexity of the physical world and the satisfaction earned in unifying its minutiae into relationships and patterns fuels my motivation with my coursework in the basic sciences. Most of my life, I have worked to understand facts and ideas that are already established. The privilege of establishing some understanding new to the world, and not only myself, is a major personal goal.

   In economic terms, what I currently bring to the table for a research lab is higher in raw materials than refined ones. I'm a relatively quick, curious learner who asks lots of questions to ensure I understand what's been introduced to me. Between formerly working as a paralegal at the Federal Trade Commission and juggling the first year of medical school with becoming president of my class, I have good practice at staying organized, managing my time, and working with others. I am resolved to learn and practice quality research.

   Just as I hope to create new understanding through research in addition to learning established science for my own practice, my long-term goal as a physician is to teach others the art of medicine. Contributing to others' education is a great privilege because of its influence on the countless decisions to be made down the road by those taught; I also find great fun in teaching others.

My desire to teach and my interest in research make pedagogical research a natural fit. I spoke with Dr. Darling about potential projects at the beginning of this school year. His interests and timeline align strongly with mine. He is in the beginning phases of designing experiments with state-of-the-art wearable eye-tracking glasses. This hardware allows measurement of visual attentive behavior with unmatched fidelity and data richness, which provides a new window into how experts and novices alike approach visual challenges (e.g., multiple choice tests, medical imaging results, surgical scenarios). Because he is currently finalizing acquisition of the hardware, working with him will allow me to help research progress from its beginning stages forward.

I am excited by the prospect of working with Dr. Darling not only because of the content of his research, but because he clearly cares about my attaining quality research experience through achieving regular minor milestones while working toward larger ones. He thus far has been excellent in helping me establish a timeline and ensuring that I understand what both he and I need to do to follow said timeline. He has challenged me to take primary responsibility for my work while providing guidance. I feel confident that at the end of my matriculation here at UMMC, I will have the experience and confidence needed to review a body of literature, formulate a good question that needs answering, design and execute an experiment that can answer the question, and relate my findings to others both in writing and in person.

5. **Project Description – Use the next 3 pages with the embedded headings for your proposal. Do not exceed 2 pages for your proposal description, including figures and tables. The 3rd page is for references only. Do not change margins, spacing or font size.**

Background

Selective attention is a phenomenon that encompasses all aspects of selective perception and response to stimuli (Treisman, 1969). Visual attention is a subset that specifically focuses on characteristics of the visual scene. In order to visually attend to a stimulus in our visual field, we direct our eyes (i.e., gaze) toward the object so that light is refracted to a specialized region of the retina (i.e., the fovea) that contains a high density of high-acuity photoreceptors. Eye tracking technology allows us to use wearable cameras to determine gaze towards attended stimuli, and therefore provides an invaluable tool for studying many aspects of visual attention including stimulus properties (Peschel and Orquin, 2013) and decision-making (Orquin and Loose, 2013). In fact, eye tracking research has shown that expertise to be determinable via relatively shorter and more deliberate gaze fixations on relevant stimuli, and it is also being used to train expert eye movements in various contexts, including its use in training residents in laparoscopic surgery (Vine et al., 2013). Eye tracking in undergraduate medical education is an emerging technique (e.g., see Zumwalt, et al., 2015 for its use in changing gaze patterns during gross anatomical dissections) that requires in broader pedagogical contexts.

Objectives/Hypothesis

Aim 1a: To establish test-taking performance of undergraduate medical students who have (M3s) or have not (M1s) taken the United States Medical Licensing Examination (USMLE) Step I (Step I) through both Step I-style tests and content-free test-wiseness tests (TWTs).

Hypothesis Ia: M3s will outperform M1s in both tests, but there will be distribution overlap with the higher performing M1s and the lower performing M3s, with more overlap on the content-free test.

Aim 1b: To use eye tracking data to identify visual attentive behavior that was associated with the population distributions of test performance established in Aim 1a.

Hypothesis Ib: Expert-like visual attentive behaviors (e.g., shorter, more deliberate gaze fixations, first on relevant stem information and then on correct answer choices) will be more prevalent in high performers (e.g., M3s) compared to low performers (e.g., M1s).

Aim 2: To teach expert-like visual attentive test-taking behaviors identified by high-performing M3s from Aim 1 to a new set of M1s.

Hypothesis II: Trained M1s will demonstrate the expert-like visual attentive behaviors they were trained to use, and their performance on both types of test will be higher than M1 performance from Aim 1a, potentially mimicking the performance of M3s.

Statement of Relevance

Developing sophisticated test-taking strategies is a marketable enterprise; the test-preparation industry was valued at over $4 billion in 2006 (Briggs, 2009). With eye tracking, we are able to circumvent the reliability and validity problems inherent within self-report data often obtained when interpreting the reason(s) behind improved test-taking abilities following interventions such as these preparation courses. A better understanding of visual attentive behaviors of expert-like test-takers will allow them to be taught to students in order to better prepare them for the standardized tests that weigh so heavily in determining academic advancement (e.g., National Board of Medical Examiners [NBME] and Step examinations). Eliminating this test-wiseness bias will improve tests' validity by reducing the number of students who fail despite understanding of tested material.

Methods

Aim 1a: Participants: We will recruit 20 M1s (students who have completed their NBME Physiology Subject Examination and have not begun second-year classes) and 20 M3s (students who have passed Step I and have not yet taken the Step II examination) from UMMC.

Experimental design: Two multiple-choice, computer-based tests will be given to subjects in a counter-balanced format. The Step I test will be a 22-minute test, consisting of 16 clinical vignette single item questions. This includes two questions per major content category in the time allotted per question as defined by USMLE. The TWT will be an 11-minute test, consisting of 8 content-free questions containing a breadth of Technical Item Flaws as defined in Chapter 3 of NBME's item writing guide (Case and Swanson, 2002). Both tests will be administered in one sitting using ExamSoft, the same program employed by UMMC for basic science examinations. Following the tests, students will be debriefed and be given a post-experiment survey where they will be asked to identify their test-taking strategies both in general and for the questions from both tests that they found most easy/difficult.

Data analysis: A 2x2 ANOVA (student year x test type) with post-hoc comparisons will be performed to determine significant differences of test performance along these factors.

Aim 1b: Experimental design: While performing the tests outlined in Aim 1a, participants will be outfitted with eye tracking equipment to measure visual attentive behavior (i.e., gaze fixations). At the beginning of each experiment, baseline gaze data (and pupillary data) will be obtained.
Data analysis: The software accompanying eye tracking equipment provided by both Sensormotoric and Tobii (companies under consideration) include several semi-automatic calculations (see Figure 1) including fixation duration, fixation order, region of interest analysis, event detection alignment, multi-user data aggregation, and pupillary size (to account for test anxiety). These data will be analyzed with respect to the groups defined by test performance in Aim 1a as well as to potential confounding variables.

Fig. 1a

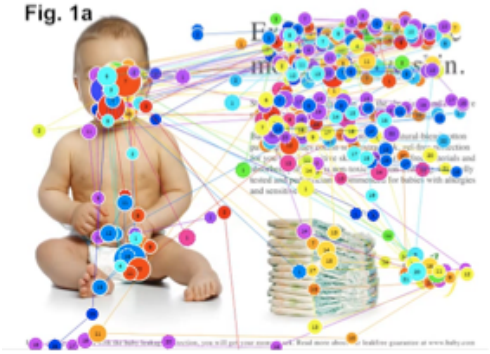
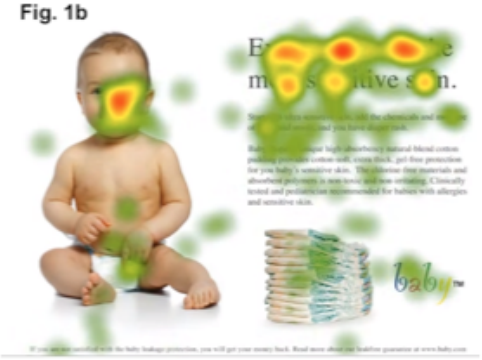


Figure 1a: "Gaze plot" demonstrating fixation duration, fixation order, and multi-user data aggregation.

Figure 1b: "Heat map" showing region of interest analysis (Tobii Pro, 2013).

Fig. 1b



Consideration of confounding variables: We anticipate that the experiential background of students may have an impact on their test performance and visual attentive behavior. Therefore, we will administer a pre-examination survey and obtain UMMC admissions data to identify potential confounding variables including: 1) demographics (e.g., sex, age, college attended), 2) standardized test preparation and performance (e.g., number of MCAT/Step I practice exams/questions taken, MCAT/Step I scores, test preparation courses and materials used), and 3) clinical experience (e.g., shadowing, rotations).

Aim 2: Participants: Subjects will be 20 M1s not previously studied**.**
Experimental design: Specifically, eye tracking software allows for the ability to replay eye tracking behavior as viewed from the outward facing camera. It also allows for manipulation of the replayed scene so that highly attended portions of the visual scene (defined by the high performers) are sequentially highlighted. Doing so forces a participant to attend to information directly related to what the high performers also attended to. Thus, both tests will be administered to this second group of M1 participants as outlined in Aim 1a, but participants will be guided visually to attend to material that was highly attended to by high performers identified in Aim 1.
Data analysis**:** Test performance and eye tracking data will be analyzed as described in Aim 1, and these data will be compared to those groups.

Anticipated Results/Potential Problems

Anticipated results: See Objectives/Hypothesis section for anticipated results.
Potential problems: First, because M1s and M3s in Aim 1a may not represent a disparate group of test-takers, it is possible that we will not reveal an underlying distribution to map eye tracking data in Aim 1b. Therefore, it may be necessary to run an additional experiment before moving on to Aim 2 to include a more expert population of participants (i.e., faculty) where differences in test-taking and visual attentive behaviors between populations are likely to emerge. Second, recruiting medical students may prove difficult given their busy schedule. Therefore, part of our budget will be used for participant compensation ($25/participant).

Timeline

10/2015-03/2016:	Attain IRB approval, acquire eye tracking hardware, design Aim 1 experiment
03-08/2016:	Recruit M1s and M3s, begin Aim 1 experiment
08-10/2016:	Continue recruiting M3s, analyze Aim 1 data
10/2016-03/2017:	Develop model for teaching selected visual attentive behaviors in M1s
03-07/2017:	Recruit M1s, begin Aim 2 experiment, begin manuscript discussing results of Aim 1
07-09/2017:	Submit manuscript for Aim 1, analyze results from Aim 2
09/2017-03/2018:	Continue analyzing results of Aim 2, write and submit manuscript for Aim 2

References

Briggs, D. C. (2009). Preparation for College Admission Exams. 2009 NACAC Discussion Paper. *National Association for College Admission Counseling*.

Orquin, J. L., & Loose, S. M. (2013). Attention and choice: A review on eye movements in decision making. *Acta psychologica*, *144*(1), 190-206.

Peschel, A. O., & Orquin, J. L. (2013). A review of the findings and theories on surface size effects on visual attention. *Frontiers in psychology*, *4*.

Tobii Pro. 2013, October 1. *Free Tobii Webinar: Introduction to eye tracking research* [Video file]. Retrieved from https://www.youtube.com/watch?v=VLzSxygcBF8

Treisman, A. M. (1969). Strategies and models of selective attention.*Psychological review*, *76*(3), 282.

Vine, S. J., Chaytor, R. J., McGrath, J. S., Masters, R. S., & Wilson, M. R. (2013). Gaze training improves the retention and transfer of laparoscopic technical skills in novices. *Surgical endoscopy*, *27*(9), 3205-3213.

Zumwalt, A. C., Iyer, A., Ghebremichael, A., Frustace, B. S., & Flannery, S. (2015). Gaze patterns of gross anatomy students change with classroom learning. *Anatomical sciences education*, *8*(3), 230-241.

6. **Please list purchases/expenses and provide a short justification for each. Total budget not to exceed $5,000. Budget for sections "a" through "e" are not to exceed $4,000. Budget for section "f" (travel) may exceed $1,000 if justified.**
   a. **Supplies**
   b. **Equipment** $500 (poster printing, informed consent form and other printing)
   c. **Computer**
   d. **Software**
   e. **Other** **$1500 (gift cards for subject recruitment)**
   f. **Travel** $3000 (plane tickets, lodging, other travel expenses for two conferences)

   Total **$5,000**

-All computers and software purchased belong to the lab, not the individual student.

7. **Education and Training Plan**
   a. **Lab Meetings, Seminar Series, and Didactic Coursework**
   We will meet regularly to establish deadlines. We have met one-on-one six times for at least an hour each so far since late August. In addition, I participated in a video conference with a representative for SMI, one of the two companies under consideration for providing eye tracking glasses and accompanying hardware and software. Dr. Darling heads the Clinical Anatomy Journal Club, which meets weekly, and he invited me to present an outline of my MSRP proposal for feedback, ideas, and criticism. I will continue to participate in the journal club insofar as my schedule allows it moving forward. As for didactic coursework, Dr. Darling has provided several articles representative of both work fundamental to research in visual attentive behavior and the latest and most relevant work in the field.
   b. **Anticipated Abstracts, Presentations, and Publications**
   Summer 2016: Present preliminary data from Aim 1 for MSRP Annual Research Day.

   Fall 2016: Submit (poster) abstract for AAA Annual Meeting in Spring 2017 discussing complete data on Aim 1.

   Summer 2017: Present preliminary data from Aim 2 for MSRP Annual Research Day.

   Fall 2017: Submit manuscript discussing Aim 1 to the journal "Medical Education"; submit (oral presentation) abstract for AAA Annual Meeting in Spring 2018.

   Spring 2018: Submit manuscript discussing Aim 2 to the journal "Medical Education".
   c. **Other Educational Opportunities (e.g., grant writing, ethics, statistics, etc.)**
   In the process of my research with Dr. Darling, I will have the opportunity to: acquire IRB approval, design my own experimental protocols, recruit human subjects, and run statistical analyses of my data, and practice figure creation for posters and articles. I already have learned much in discussing this proposal and which modality with which to examine visual attentive behavior (e.g., test-taking, gross anatomy lab, imaging studies).
   d. **Mentorship Plan**
   Clear communication and expectations are central to our plan. Dr. Darling will be setting up his own protocols and experiments upon acquisition of the eye tracking hardware; this will allow collaboration toward designing a quality experimental test-taking model with the eye tracking glasses. Dr. Darling has already shown strong mentorship during the MSRP application process: challenging me to write the proposal (excepting the background and statement of relevance) while providing advice, editing, and criticism; encouraging the test-taking model and pointing out areas for improvement in proposal design; including me in the process of selecting the best eye tracking equipment; and not only inviting me to participate in the Clinical Anatomy Journal Club, but having me present my outline before its members (faculty and students) for feedback. We are confident our collaboration will result in completion of the goals stated above as well as help me develop into a scientist who will be confident and excited to continue research alongside providing medical care throughout my career.

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE
Ryan D Darling	Assistant Professor
eRA COMMONS USER NAME (credential, e.g., agency login) rdarling	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Miami University, Oxford, OH	BA	05/00	Psychology
Miami University, Oxford, OH	MA	12/05	Biopsychology
Miami University, Oxford, OH	PhD	12/08	Biopsychology
University of Mississippi Medical Center, Jackson, MS	Postdoctoral fellow	12/08	Neuroscience

A. Personal Statement

I have recently transitioned from being a basic neuroscience researcher to a Clinical Anatomist. As a Clinical Anatomist, I will focus my efforts as an educator scholar on teaching the clinical application of human anatomy in various courses and schools within the University of Mississippi Medical Center. I will also conduct pedagogical research to better understand how to aid learners within various healthcare fields. I am particularly interested in using eye tracking to reveal the implicit mechanisms of novices and experts as they search and extract relevant anatomical information from various visual scenes (e.g. cadaveric material, medical imaging, 3D anatomy lab). Another area of research I'd like to pursue with eye tracking is to better understand how medical students visually attend to USLME-style clinical vignette question-stems and answer choices in ExamSoft. With eye tracking, we can learn how students' gaze patterns are related to test-taking performance and their decision processes, with the goal of teaching these search strategies to lower-performing students to improve their test-taking abilities. With my background in psychology and basic learning and memory neuroscience research, I feel that I will contribute significantly to the field of medical education research with a laboratory that utilizes eye tracking.

Johnny Lippincott expressed interest in the pedagogical topics that I'm currently pursuing, and suggested that we apply for the Medical Student Research Program so that he could be afforded the opportunity to study the test-taking behavior of medical students. Because I will be spending the next several months setting up this equipment, Johnny will be afforded a unique research experience, as he will be exposed to all aspects of research design (e.g. equipment setup, IRB proposal) and execution (e.g. running experiments, data analysis, abstract/manuscript preparation).

B. Positions and Honors

Positions and Employment

1999-2001	Youth Leader, Butler County Juvenile Rehabilitation and Detention Center, Hamilton, OH
2001-2002	Probation Officer, Butler County Juvenile Court, Hamilton, OH
2002-2006	Graduate Assistant, Psychology Department, Miami University, Oxford, OH
2007-2008	Teaching Associate, Psychology Department, Miami University, Oxford, OH
2008-2010	Postdoctoral Research Fellow, Anatomy Department, University of Mississippi Medical Center, Jackson, MS
2010-2014	Instructor, Department of Neurobiology and Anatomical Sciences, University of Mississippi Medical Center, Jackson, MS
2012-present	Adjunct Faculty, Department of Psychology, Millsaps College, Jackson, MS

2014-present Assistant Professor, Department of Neurobiology and Anatomical Sciences, University of Mississippi Medical Center, Jackson, MS

Other Experience and Professional Memberships

2002-present Society for Neuroscience
2003-2008 Ohio Miami Valley Chapter of the Society for Neuroscience
2006-2008 The Pavlovian Society
2008-present Mississippi Chapter of the Society for Neuroscience
2013-present American Association of Anatomists

Honors

2003 Letter of commendation for graduate studies, Miami University, Oxford, OH
2004 William Smith Neuroscience Award, Miami University, Oxford, OH
2004 Graduate Achievement Award, Miami University, Oxford, OH
2006 Patrick Capretta Memorial Scholarship for Research, Miami University, Oxford, OH

C. Peer-reviewed Publications

1. Cicchese JJ, **Darling RD**, Berry SD (2015). Pretrial hippocampal theta-state differentiates single-unit response profiles during rabbit trace eyeblink conditioning. *Learning and Memory*, in press.
2. Zhou X, Lu JYF, **Darling RD**, Simpson KL, Zhu X, Wang F, Yu L, Sun X, Merzenich M, Lin RCS (2015). Behavioral training reverses global cortical network dysfunction induced by perinatal antidepressant exposure. *Proceedings of the National Academy of Sciences*, 112(7):2233-2238.
3. Zhang J, Dennis KA, **Darling RD**, Alzghoul L, Paul IA, Simpson KL & Lin RCS (2013). Neonatal citalopram exposure decreases serotonergic fiber density in the olfactory bulb of male but not female adult rats. *Frontiers in Cellular Neuroscience* 7(67):1-8.
4. Bortolato M, Alzghoul L, Zhang J, **Darling RD**, Simpson KL, Bini V, Chen K, Wellman CL, Lin RCS & Shih JC (2013). Monoamine oxidase A and A/B knockout mice display autistic-like features. *International Journal of Neuropsychopharmacology*, 16:869-888.
5. Alzghoul L, Bortolato M, Delis F, Thanos PK, **Darling RD**, Godar SC, Zhang J, Grant S, Wang GJ, Simpson KL, Chen K, Volkow ND, Lin RCS & Shih JC (2012). Altered cerebellar organization and function in monoamine oxidase A hypomorphic mice. *Neuropharmacology* 63:1208-1217.
6. **Darling RD**, Alzghoul L, Zhang J, Khatri N, Paul IA, Simpson KL & Lin RCS (2011). Perinatal citalopram exposure selectively increases locus coeruleus circuit function in male rats. *Journal of Neuroscience* 31(46):16709-16715.
7. Zhang J, **Darling RD**, Paul IA, Simpson KL, Chen K, Shih JC & Lin RCS (2011). Altered expression of tyrosine hydroxylase in the locus coeruleus noradrenergic system in citalopram exposed rats and monoamine oxidase A knockout mice. *Anatomical Record* 294(10):1685-1697.
8. **Darling RD**, Takatsuki K, Griffin AL & Berry SD (2011). Eyeblink conditioning contingent on hippocampal theta enhances hippocampal and medial prefrontal responses. *Journal of Neurophysiology* 105:2213-2224.
9. Griffin AL, Asaka Y, **Darling RD** & Berry SD (2004). Theta-contingent trial presentation accelerates learning rate and enhances hippocampal plasticity during trace eyeblink conditioning. *Behavioral Neuroscience* 118(2):403-411.

D. Research Support

N/A

THE UNIVERSITY OF MISSISSIPPI
MEDICAL CENTER

Office of the Vice Dean for Medical Education
School of Medicine
2500 North State Street
Jackson, Mississippi 39216
Fax: 601.815.1861

Office of Medical Education: 601.984.5006

October 6, 2015

To Whom It May Concern:

I am delighted to write this letter of good standing for our student John Lippincott. John graduated from Emory University in Atlanta, Georgia with a Bachelor of Arts degree in philosophy in 2009. He then earned a Master of Science degree from Georgetown University in Washington, D.C. in 2014. He joined our medical school in the fall of 2014.

John is a second year student in good academic standing, who has served for the past two years as president of his medical school class. He has been a model student with no academic or disciplinary actions.

If you should have any questions, please do not hesitate to contact me.

Loretta Jackson-Williams, M.D., Ph.D.
Vice Dean for Medical Education
University of Mississippi School of Medicine
2500 North State Street
Jackson, MS 39216
(601) 984-5006

THE UNIVERSITY OF MISSISSIPPI
MEDICAL CENTER

Department of Neurobiology and
Anatomical Sciences
2500 North State Street
Jackson, Mississippi 39216-4505
Phone (601) 984-1640
Fax (601) 984-1655

October 12, 2015

Medical Student Research Program (MSRP) Review Committee
University of Mississippi Medical School

Dear Committee Members:

I am writing to express my strong support for Dr. Ryan Darling as mentor for Johnny Lippincott in their Medical Student Research Program proposal entitled, "Identifying and Teaching Visual Attentive Behavior in a Test-Taking Model Using Eye Tracking". Dr. Darling is an Assistant Professor in my department in the Division of Clinical Anatomy, and is currently developing his independent research program using eye tracking to better understand visual attention in a variety of pedagogical applications. He has been in contact with two companies that provide wearable eye tracking solutions (Sensomotoric and Tobii) and is finalizing his decision for purchase.

Dr. Darling has the resources to purchase this equipment, and I have the utmost confidence that he will be able to quickly setup the apparatus in his lab. I am equally certain that this research project will provide an invaluable experience for Johnny, as he will be part of both experimental design and implementation phases of the project. I think this is an outstanding opportunity for student research as an MSRP project, and it has my full support.

Please don't hesitate to contact me if you have questions or concerns.

Sincerely,

Michael N. Lehman, Ph.D.
Professor and Chair
Department of Neurobiology and Anatomical Sciences

John K. Lippincott

1055 Quinn Street, Apt. A, Jackson, MS 39202 • jlippincott@umc.edu • (662) 322-2414

EDUCATION

University of Mississippi Medical Center School of Medicine 2014-Present
- *Doctor of Medicine, anticipated May 2018*
- 4.00 GPA over 63 credit hours

Georgetown University 2013-2014
- *MS, Physiology and Biophysics*
- 3.80 GPA

University of Mississippi Summer 2012, Spring 2013
- *Post-baccalaureate study, 21 credit hours*
- 4.00 GPA

Emory University 2005-2009
- *BA, Philosophy*
- 3.19 GPA

MCAT score: 42 2013
- 13 PS, 14 VR, 15 BS

RESEARCH EXPERIENCE

Drs. Wu Zhou and Hong Zhu, University of Mississippi Medical Center Summer 2015
- Establish method for abducens nuclear elecrophysiological recording in rat model
- Assist with Rhesus monkey temporal bone dissection for morphological analysis

Dr. Christopher Leary, University of Mississippi Department of Biology Spring 2013
- Observe treefrogs and gather samples in the field
- Assist with radioimmunoassays, analyze data

PUBLISHED WORK/ABSTRACTS

Lippincott, J., Weatherly, L., Hansen, D. (2015). Amiodarone-Induced Pulmonary Toxicity Manifesting as Acute Respiratory Distress Syndrome in a Non-Cardiothoracic Post-Operative Patient; (Abstract). Poster to be presented at the American College of Physicians Mississippi Chapter Annual Abstract Day, October 30, 2015, Jackson, MS.

Sandlin, D., Zhang, Chunming, Lippincott, J., Yu, Y., Stewart, C., Huang, J. Peeden, E., Zhu, H. Zhou, W. (2015). Cardiorespiratory Responses Induced by Primary Blast Exposure via the Ear Canal in Rats; (Abstract). Poster to be presented at the 39th MidWinter Meeting of the Association for Research in Otolaryngology, February 20-24, 2016, San Diego, California.

Leary, C. J., Lippincott, J., Harris, S., & Hawkins, D. L. (2015). A Test of the Energetics-Hormone Vocalization Model in the Green Treefrog. *General and Comparative Endocrinology*. *213*, 32-39.

LEADERSHIP, CLINICAL, WORK, and VOLUNTEER EXPERIENCE

Class President, School of Medicine Class of 2018 Fall 2014-Present
Volunteer, Jackson Free Clinic Spring 2015-Present