

Cellas Ari'ka Hayes, PhD

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Education

Stanford University, Stanford, CA

Degree Type: *Postdoctoral Training*

School of Medicine Department of Department of Neurology & Neurological Sciences

Neuroimaging, Alzheimer's Disease, Aging Pathology

Start Date: December 1, 2022, Expected End Date: TBD

The University of Mississippi, University, MS

Degree Type: *Doctor of Philosophy, Ph.D.*

School of Pharmacy Department of BioMolecular Sciences

Program: Pharmaceutical Sciences

Emphasis: Pharmacology

Start Date: May 2019, End Date: November 8, 2022

The University of Mississippi Medical Center, Jackson, MS

Degree Type: Certification in Epidemiology and Biostatistics

UMMC-Graduate Educational Training Center

Start Date: April 2020, End Date: April 1, 2022

The University of Mississippi, University, MS

Degree Type: Bachelor of Arts

School of Liberal Arts Department of Biology and Classics

Start Date: August 2015, End Date: May 11, 2019

Noteworthy Research and Professional Development Programs

August 2022-Present

Neuroscience Scholars Program (Fellow)

- *The Neuroscience Scholars Program (NSP) is a two-year online training program open to underrepresented graduate students and postdoctoral researchers. Professional development and mentoring opportunities are offered throughout the two-year duration of the program.*

Summer 2022

Marine Biological Laboratory Summer Program in Neuroscience, Excellence and Success (SPINES) Program

- *The course attracts 20 leading faculty from across the country to teach our 15-20 students in a 3-week intensive immersion experience dedicated to creating and sustaining an outstanding diverse workforce in neuroscience.*

June 2020-June 2022

Neuroscience Scholars Program (Associate Recipient)

- *The Neuroscience Scholars Program (NSP) is a two-year online training program open to underrepresented graduate students and postdoctoral researchers. Professional development and mentoring opportunities are offered throughout the two-year duration of the program.*

April 2020-April 2022

UM Southern Regional Education Board Program (UM SREB)

- The University of Mississippi gives 6 fellowships to students enrolled in doctoral programs. The award also requires scholars to attend the Institute on Teaching and Mentoring Conference annually.

Publications

1. **Insulin-like Growth Factor-1 and Ischemic Stroke Outcomes: Evidence from Clinical and Preclinical Interventions:** In this review, we discuss the significant functions of IGF-1 in neurons and glial cells and provide insight on the downstream cellular and molecular changes as support for IGF-1 levels being beneficial in stroke patients and *in vivo* studies.
 - a) **Hayes CA**, Valcarcel-Ares MN, Ashpole NM (2020) Insulin-like Growth Factor-1 and Ischemic Stroke Outcomes: Evidence from Clinical and Preclinical Interventions. *Journal of Cerebral Blood Flow and Metabolism* PMID: 33757314
DOI: [10.1177/0271678X211000894](https://doi.org/10.1177/0271678X211000894)
2. **Black Scientists Are Not the Door to Diversity:** In this editorial, I highlight the over-extendedness that black trainees and faculty face within the scientific community.
 - a) **Hayes CA**. (2021) Black Scientists Are Not the Door to Diversity. *ACS ChemNeuro* PMID: 34115483 DOI: <https://doi.org/10.1021/acscchemneuro.1c00375>
3. **IGF-1 Differentially Modulates Glutamate-Induced Toxicity and Stress in Cells of the Neurogliovascular Unit:** This project focused on delineating the role that IGF-1 has on neuroprotection and responses of glial cells comprising the neurogliovascular unit.
 - **Hayes CA**, Ashmore BG, Vijayasankar A, Marshall JP, Ashpole NM. (2021) *Frontiers in Aging Neuroscience* PMID: 34887742
DOI: <https://doi.org/10.3389/fnagi.2021.751304>

Under Review/In-Preparation Manuscripts

1. **High sensitivity C-Reactive Protein Association with Stroke Incidence: The Jackson Heart Study:** This project focused on determining if hs-CRP (inflammation) is associated with total stroke incidence in African Americans enrolled in the Jackson Heart Study
 - a) **Hayes CA**, Bruce M, Bruce B, Dhamoon M, Heitman E, Norris K, Renker J, Thorpe R. *Currently in 2nd round of revisions for the JHS P&P Committee with intentions to submit to the Journal of American Heart Association*

2. **Neuronal and Astrocyte Insulin-like Growth Factor-1 Signaling Differently Modulates Ischemic Stroke Damage:** This project focused on understanding how neuronal and astrocytic IGF-1 signaling alters ischemic stroke outcomes.
 - a) **Hayes CA**, Morgan NI, Thomas KC, Pushie MJ, Vijayasankar A, Ashmore BG, Wontor K, De Leon MA, Ashpole NM. *Second round of revisions*

3. **Adulthood Deficiency of the Insulin-like Growth Factor-1 Receptor in Hippocampal Neurons Impairs Cell Structure and Spatial Learning and Memory in Male Mice:** This project focused on understanding how neuronal IGF-1 in the hippocampus influenced learning and memory.
 - a) **Hayes CA**, Hodges EL, Marshall JP, Logan S, Farley JA, Owens DB, Sonntag WE, Ashpole NM. (2022)
Preprint access: <https://www.biorxiv.org/content/10.1101/2021.08.08.455596v1>

4. **Astrocytic Insulin-like Growth Factor-1 Receptor Deficiency Alters Cognition and Behavioral in a Sex-Dependent Manner:** This project focused on understanding how astrocytic IGF-1 signaling alters learning, memory, anxiety, and behavioral despair.
 - a) **Hayes CA**, Prabhu D, Hodges EL, Marshall JP, Khan S, Ashmore BG, Ashpole NM.
Currently being reviewed by all authors to be submitted to Journal Brain and Behaviour

5. **Insulin-like Growth Factor-1 and Cognition:** This literature review focuses on the clinical, preclinical, cellular, and molecular aspects of IGF-1 and cognition.
 - a) **Hayes CA**, Wilson D, Ashpole NM. *Currently in preparation to be submitted to the Journal Cells*

6. **Advanced Glycation End Products Role in Metabolic Aging and Cognition in Early Life:** This project focused on understanding the role of advanced glycation end productions with cognition and side effects of metabolic aging like increased weight gain and muscle function.
 - a) De Leon M, **Hayes CA**, Ashmore BG, Morgan NI, Martin A, Stewart JA, Ashpole NM.
Currently in preparation to be submitted to Journal eLife

7. **Chronic Early Life Exposure of THC in Male Mice Accelerates Mid-Life Cognitive and Behavioral Deficits:** This project focused on understanding how consistent chronic low doses of THC in male mice altered learning and memory, functional deficits, and aging phenotypes in middle age.
 - a) Marshall JP, **Hayes CA**, Blackburn K, Ashpole NM. *Currently in preparation*

Funded External Funding Applications

2019	Graduate School Counsel Research Grant from the University of Mississippi -competitive award given in the amount of \$1,000
2022	Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research F31 *1 st Black trainee to receive this award at UM *3 rd trainee in history to receive this award at UM (1985-1987-2022)
2022-2024	Stanford Propel Fellowship -competitive 2-year postdoctoral fellowship that provides salary, research, and supplemental funds along with professional development opportunities

Honors, Awards, and Notable Features

2022-Present	Neuroscience Scholars Program Fellow -awarded by SfN, a two-year program that provides scientific and professional development opportunities for neuroscience trainees. 1 of 18 fellows chosen
2022	Admitted into Stanford Postdoctoral Recruitment Initiative in Sciences and Medicine (PRISM)
2021/2022	Recipient of Marine Biological Laboratory Summer Program in Neuroscience, Excellence and Success (SPINES) Program -The course attracts 20 leading faculty from across the country to teach our 15-20 students in a 3-week intensive immersion experience dedicated to creating and sustaining an outstanding diverse workforce in neuroscience.
2021	TPDA, Trainee Professional Development Award , awarded by SFN, Society for Neuroscience, to attend SfN2021 Conference.
2021	The US-Canada Regional Committee of IBRO (International Brain Research Organization) Fellowship
2021	University of Mississippi School of Pharmacy Department of Biomolecular Sciences Marvin Davis Pharmacology Award
2021	Rho Chi, The Academic Honor Society of Pharmacy
2021	Honorable Mention-The National Academy of Sciences Engineering and Medicine Ford Foundation Pre-Doctoral Fellowship (NASEMFord)
2020	Neuroscience Scholars Program Associate -awarded by SfN, a two-year program that provides scientific and professional development opportunities for neuroscience trainees from underrepresented and diverse backgrounds
2020	Graduate School Counsel Research Grant from the University of Mississippi -competitive award given in the amount of \$1,000
2020	Honorable Mention-National Science Foundation Graduate Research Fellowship Program (NSF-GRFP)
2019	TPDA, Trainee Professional Development Award , awarded by SfN,

	Society for Neuroscience, to attend SFN2019 Conference.
2019	UM Southern Regional Education Board Program (UM SREB): The University of Mississippi gives 6 fellowships to students enrolled in doctoral programs. Awards include full tuition waiver and supplemental stipend.
2019	Ole Miss Greek Man of the Year: Highest award given to a male member of the University of Mississippi Greek Counsel
2019	Ole Miss Who's Who Selection 2018/2019: 200 hundred students are selected to be the University of Mississippi's Who's Who Award.
2018	Student Travel Award via Annual BioMedical Research Conference for Minority Students (ABRCMS) 2018
2017	Distinguished Research Citation Award at University of Mississippi School of Pharmacy Spring 2017-Given to an undergraduate student who is nominated by faculty for research in School of Pharmacy
2017	A Milden Classics Scholarship Recipient -Scholarship amount of \$3500, given to a student who excels academically in the Classics Department
2017	Classics Foundation Scholarship- \$2500 Award in support from the McDonnell Foundation Scholarship
2016	Dr. Pepper SEC Study Abroad Scholarship Recipient -Scholarship amount of \$2000 awarded to a student who is studying abroad for at least 4 weeks
2016	Global Engagement Scholarship Recipient -Scholarship amount of \$1000 given to student study abroad for at least 4 weeks, essay-based scholarship
2015	The University of Mississippi Luckyday Scholarship Recipient -Scholarship amount of \$5000 given to undergraduate at the University of Mississippi
2015	Chancellor's Leadership Scholarship Recipient -Scholarship amount of \$1000 given to Freshman who exhibits exceptional leadership qualities in high school
2015	Bledsoe Scholarship Recipient -Scholarship amount of \$1500 given to first time undergraduate students who maintain a 3.0 GPA
2015	Academic Excellence Scholarship Recipient - Scholarship amount of \$1500 given to a student who scores 25 of ACT in high school.

Noteworthy Features & Science Communication Outreach Links

2022	NIH F31 Story: First Trainee to Receive Award in 35 Years https://news.olemiss.edu/pharmacology-graduate-student-building-a-legacy-through-research/
2022	Alumni Advice to UM Class of 2022 https://news.olemiss.edu/alumni-offer-advice-to-new-graduates/
2021	Sci Communication with Dr. Sherry Nouraini Podcast/Live Twitter
2021	Science Communication with Adam MA Simpson

2021	Science Communication with Adam MA Simpson https://www.youtube.com/watch?v=pfT0XKrImp4
2019-	University of Mississippi Admissions Department Recruiting Video: https://www.youtube.com/watch?v=4jQvKMOVnE8&t=1s
2019	<i>Mississippi Works</i> Magazine Feature: https://www.pageturnpro.com/Arkansas-Business-Group/92362-MSWorks_2019_20/sdefault.html#page/74
2019	Commencement Highlight: <i>Beating the Odds Cellas Ari'ka Hayes</i> https://news.olemiss.edu/beating-the-odds/
2017	Feature in <i>Mississippi Today</i> Newspaper: <i>Summer Student Spotlight: Into the wild for the cure to cancer</i> https://mississippitoday.org/2017/07/21/summer-student-spotlight-into-the-wild-for-the-cure-to-cancer/

Responsible Conduct of Research Certifications, Seminars, and Courses

2022	Stanford Collaborative Institutional Training Initiative (CITI) Program	
2022	Society for Neuroscience Responsible Conduct of Research Short Course	3 hours
2021	University of Mississippi School of Pharmacy Responsible Conduct of Research Summer Workshop	15 hours
2020	Research Ethics Course	13 hours
2018	Collaborative Institutional Training Initiative (CITI) Program	

Research Experience

August 2016-November 2022

Research Assistant

Department of Biomolecular Sciences Neuropharmacology Lab,
The University of Mississippi, University, MS

- Rodent Surgical Procedures
- In Vitro Pharmacology
- Cellular and Molecular Ex Vivo Analysis

January 2018-July 2019

Research Student

Department of Biology
The University of Mississippi, University, MS

- Organize mycorrhiza database
- Perform meta-analysis of mycorrhiza database analysis
- Maintain and generate new information from publications for mycorrhiza database

June 2017-July 2017

International Research Experience for Students (IRES)

National Science Foundation International Research Experience for Students

*Department: BioMolecular Sciences at University of Mississippi,
Project Location: Hajnowka and Bialystok, Poland*

- Organizer of first International Conference for Polish Botanical Society at Politechnika Bialostocka
- Perform various pharmacognosy and chemistry laboratory techniques
- Analyzed ectomycorrhiza fungi from various plants

Teaching Experience

The below lectures are invited single guest lectures in undergraduate and professional courses where I crafted the lecture presentation, active learning exercises, and exam questions.

2022	Biomolecular Sciences II (Professional Pharmacy Students-P1)	1 hour
2022	Physiology: CNS Cell Types Function	1 hour
2022	Microbiology: Allied Health Nursing Students	1 hour

The below course is a graduate elective that allowed me to guest lecture established courses, write objectives and exam questions aligned with Bloom's Cognitive Taxonomy, and craft a teaching portfolio.

2022	Enrolled in Teaching in Pharmacology Course	1 hour
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Professional Appointments

- 2019-Summer 2021** **University of Mississippi Graduate School Ambassador**
Graduate School
The University of Mississippi, University, MS
- Participate and organize recruiting events
 - Serve as a liaison for students, faculty, and staff
- 2016-November 2019** **UofM Pre-College Programs Counselor**
Division of Outreach
The University of Mississippi, University, MS
- Participate and organize leadership events
 - Serve as a liaison for students, faculty, and staff
 - Counselor for UofM competitions (UMAIT, BrainBrawl, Mathcounts, Science Olympiad, etc.)
- June and July 2018** **Ole Miss Summer College Counselor**

Division of Outreach

The University of Mississippi, University, MS

- Serve as a counselor to high school students

Presentations

- 2022** **“Uncovering IGF-1 Signaling Neuroprotective Mechanisms Responsible for Neuroprotection Following Stroke”**
- Diversity Poster Session at the Society for Neuroscience
 - **Hayes CA**, Morgan NI, Thomas KC, Pushie MJ, Vijayasankar A, Ashmore BG, Wontor K, De Leon MA, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy
- 2022** **“Uncovering IGF-1 Signaling Neuroprotective Mechanisms Responsible for Neuroprotection Following Stroke”**
- Poster Session at the Society for Neuroscience
 - **Hayes CA**, Morgan NI, Thomas KC, Pushie MJ, Vijayasankar A, Ashmore BG, Wontor K, De Leon MA, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy
- 2022** **“Uncovering the IGF-1 Signaling Mechanisms Responsible for Neuroprotection Following Stroke”**
- Oral Presentation for Dissertation Research Prospectus
 - **Hayes CA**, De Leon MA, Morgan NI, Ashmore BG, Vijayansakar A, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy
- 2021** **“AGE/RAGE Signaling Impacts on Healthspan: Early-life Cognitive Assessments”**
- Poster Presentation at University of Mississippi Glycore Mid-Year Biology Conference
 - **Hayes CA**, Ashmore BG, De Leon MA, Morgan NI, Stewart JA, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy
- 2021** **“Neuroendocrine Modulation Alters Cellular Protection in the Neurogliovascular Unit”**
- Poster Presentation at the Society for Neuroscience
 - **Hayes CA**, Ashmore BG, Vijayansankar A, Marshall JP, Ashpole NM
 - Department of Biomolecular Sciences
- 2021** **“AGE/RAGE Signaling Impacts on Healthspan: Early-Life Cognitive Assessments”**
- Oral Presentation at the University of Mississippi Glycore Biology Conference

- **Hayes CA**, Ashmore BG, De Leon MA, Morgan NI, Stewart JA, Ashpole NM
- Department of Biomolecular Sciences, School of Pharmacy

- 2021** **“Cannabigerol, Cognition, and Lifespan”**
- Oral Presentation for Original Research Proposal Qualifying Exam
 - **Hayes CA**
 - Department of Biomolecular Sciences, School of Pharmacy

- 2021** **“Neuroendocrine Modulation Alters Cellular Function in the Neurogliovascular Unite and Learning and Memory In Vivo**
- Virtual Poster Presentation for Black in X Conference
 - **Hayes CA**, Ashmore BG, Vijayasankar A, Hodges EL, Marshall JP, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy
 - *Received 1st place for virtual poster competition*

- 2019** **“Reductions in Hippocampal IGF-1 Signaling in Adulthood Negatively Regulates Neuron Structure and Cognition”**
- Diversity Poster Session at the Society for Neuroscience
 - **Hayes CA**, Hodges EL, Marshall JP, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy

- 2019** **“Reductions in Hippocampal IGF-1 Signaling in Adulthood Negatively Regulates Neuron Structure and Cognition”**
- Poster Session at the Society for Neuroscience
 - **Hayes CA**, Hodges EL, Marshall JP, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy

- 2018** **“Reductions in IGF-I Receptor in the Adult Hippocampus Impairs Learning and Memory”**
- Oral Presentation at the Annual Biomedical Research Conference for Minority Students (ABRCMS) 2018
 - **Hayes CA**, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy

- 2018** **“Aspects of IGF-1 and the Aging Brain”**
- Oral Presentation at the University of Mississippi for 50 Congressional Delegates
 - **Hayes CA**, Ashpole NM
 - Department of Biomolecular Sciences, School of Pharmacy

- 2018** **“Reductions of the IGF-1 Receptor in the Adult Hippocampus Impairs Learning and Memory”**
- Oral Presentation at the Mississippi Academy of Sciences
 - **Hayes CA**, Ashpole NM

- Department of Biomolecular Sciences, School of Pharmacy
- *Received Award of 2nd Place in Cell and Molecular Biology Division*

2018 “Reductions of the IGF-1 Receptor in the Adult Hippocampus Impairs Learning and Memory”

- Poster Presentation at the Mississippi Academy of Sciences
- **Hayes CA**, Ashpole NM
- Department of Biomolecular Sciences, School of Pharmacy
- *Received Award of Overall 5th Place (out of 208 posters)*

Co-Authored Presentations

2022 “Receptor for Advanced Glycation End Products Signaling Impacts on Healthspan: Early-life Behavioral Assessments.”

- Poster Presentation at the American Aging Association
- De Leon MA, **Hayes CA**, Ashmore BG, Morgon NI, Stewart JA, Ashpole NM
- Department of Biomolecular Sciences, School of Pharmacy

2022 “Receptor for Advanced Glycation End Products Signaling Impacts on Healthspan: Early-life Behavioral Assessments.”

- Poster Presentation at the American Aging Association
- Ashpole NM, De Leon MA, **Hayes CA**, Ashmore BG, Morgon NI, Stewart JA
- Department of Biomolecular Sciences, School of Pharmacy

Non-Service Invited Talks/Panels

2023 “Success Looks like Us”

- Zoom Oral Presentation for the Mid-Atlantic Neuroscience Diversity Scholars (MiNDS) Program

2022 “Transforming Your Graduate School Career for Success”

- Panel/Oral Presentation at the NIH Blueprint Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (BP-ENDURE) 12th Annual Meeting

Leadership and Organizations

2022 Minority Association of Successful Scientists (MASS)

Founder of organization at the University of Mississippi
Inaugural Presentation

This organization serves a bridge for graduate students interested in biomedical careers. It provides an unique opportunity to gain service hours along with

professional development and networking through invited government, industry, and academic speakers.

Service

Total Hours: 305

2021-Present	Letters to a PreScientist	5 hours
2023	What is Graduate School	1 hour
2022	Black in Neuro Personal Statement Workshop	5 hours
2022	UM Speaker's Edge Judge	2 hours
2021	University of Massachusetts Amherst STEM Talk	2 hours
2020-Present	Diversity Equity and Inclusion School of Pharmacy Committee, Graduate Student Representative	12 hours
2021	Guide to College- First Generation College Student Presentation/STEM given to Byhaila High School-Keynote Speaker	2 hours
2021	Guide to College- First Generation College Student Presentation/STEM given to Murrah High School-Keynote Speaker	1 hour
2020	Keynote Student Speaker on "How to Get to Graduate School" for McNair Scholars	1 hour
2018-2019	Ole Miss Ambassador	110 hours
2019	Guide to College- First Generation College Student Presentation given to Sigma Beta Club-Keynote Speaker	1 hour
2019	Division of Outreach First Generation High School Student Keynote Speaker	1 hour
2019	UofM MOST Conference Panel Guest Speaker with Director of Fraternity and Sorority Life, Assistant Director of Fastrack, Director of Health Profession Office, Assistant Professor of Chemistry, and Assistant Dean of Engineering	3 hours
2019	Division of Outreach First Generation High School Student Keynote Speaker	1 hour
2019	Bramlett Elementary STEM Club	10 hours
2016-2018	Oxford High Way Pickup	12 hours
2016-2018	Competition Corps Events	90 hours
2016-2018	Big Event	15 hours
2018	Out of the Darkness Suicide Awareness Walk	2 hours
2018	Minority Association of Premedical Students Health Walk	1 hours
2017	Multiple Sclerosis Bike Race	6 hours
2017	Oxford Boys and Girls Club Fall Festival	3 hours
2017	Oxford Intermediate Mentoring	10 hours

2016	Autism Walk	1 hour
2016	Relay for Life	2 hours
2016	Christ Temple Halloween Carnival	4 hours
2015	Green Grove Recycling	3 hours
2015	Fall Festival at Crenshaw Elementary	5 hours

Mentorship

Mentee	Duration of Mentorship	Mentorship Affiliation
Almarely Berrios, MA	November 2022-Present	Neuroscience Scholars Program
Immanuela Enwesi	November 2022- Present	BP-ENDURE/MINDS Program
Emily Rasmussen, BS	September 2022-Present	NSF GRFP Grant Writing Workshop
Stephen Weirdu	August 2022-Present	BIN Personal Statement Workshop
Nana Dark Oaquis	2022-Present	BIN Personal Statement Workshop
Brandon Ashmore	2021-Present	Undergraduate Researcher
Voke Tonia Aminoe, PharmD	2020-Present	Graduate Mentor
Olivia Burchfield	2018-Present	Lott Leadership Program
Kamryn Thomas	2022-Spring 2023	McNair Scholar Research
Akshaya Vijayansankar, BA	2020-2022	Undergraduate Researcher
Nyah I. Morgan, BA	2022	Undergraduate Researcher
Destiny Wilson, BS	2022	Undergraduate Researcher
Caria Carter, BA	Summer 2021	MS INBRE Program
Rachel Boone, BA/MS	2019-2022	Graduate Researcher

Memberships

- **American Chemical Society**-2021:Present
- **Rho Chi**, the Academic Honor Society of Pharmacy-2021:2022
- **Interdisciplinary Association for Population Health Science**-2020:2022
- **American Heart Association**-2020
- **Society for Neuroscience** – 2019:Present
- **The National Society of Collegiate Scholars**-2016:2019
- **The Society of Collegiate Leadership and Achievement**-2016:2019
- **Eta Sigma Phi Honor Society**-2016:2019
- **University of Mississippi Pulse Leadership Conference**-participation of UofM Pulse Leadership Conference in 2017