

McNair Scholars Program University of Nebraska-Lincoln

Fall/Winter 2020-21

Welcome, 2020 McNair Cohort!



Cleopatra Babor is a plant biology major from Naperville, Illinois. Cleo will be conducting research with Dr. David Holding, Agronomy & Horticulture.



Dorian Bobbett is a chemical engineering major from Lincoln, Nebraska. Dorian is working with Dr. Grace Panther, Civil & Environmental Engineering.



Seth Caines is a biological systems engineering major from Hanover Park, Illinois. Seth will be conducting research with Dr. Shannon Bartelt-Hunt, Civil & Environmental Engineering.



Jocelyn Covarrubias is a psychology major from Grand Island, Nebraska. Jocelyn will be conducting research with Dr. Anna Jaffe, Department of Psychology.



Evelyn Estrada Gonzalez is a psychology major from Newman Grove, Nebraska. Evelyn is conducting research with Dr. Lisa Knoche from the Nebraska Center for Research on Children, Youth, Families & Schools.



Noah Garcia is a mechanical engineering major from Solana Beach, California. Noah is conducting research with Dr. Carl Nelson from the Department of Mechanical & Materials Engineering.



Bailey Mullins is an environmental studies major from Omaha, Nebraska. Bailey will be conducting research with Prof. Trenton Franz from the School of Natural Resources.



Daniel Nguyen is a psychology and political science major from Lincoln, Nebraska. Daniel is conducting research with Dr. Cynthia Willis-Esqueda, Department of Psychology.



Alyssa Simpson is a physics major from Omaha, Nebraska. Alyssa is conducting research with Dr. Xia Hong, Department of Physics & Astronomy.



Josselyn Telule is a psychology major from Omaha, Nebraska. Josselyn will be conducting research with Dr. Debra Hope, Department of Psychology.



Haley Witthuhn is a psychology major from North Loup, Nebraska. Haley is conducting research with Dr. Jenna Finch, Department of Psychology.

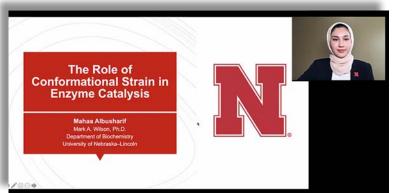


Khalid Yusuf is a psychology major from Omaha, Nebraska. Khalid will be conducting research with Dr. William Spaulding, Department of Psychology.

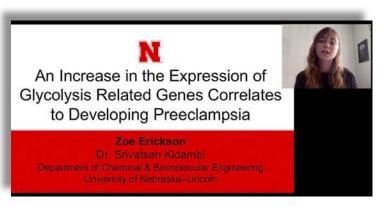
Scholars Gain Skills & Confidence During MSRE

We did not let a global pandemic stop the 2020 McNair Summer Research Experience (MSRE) from proceeding remotely. Summer 2020 may have been a challenge, but it was well worth it to our Scholars! After successfully completing their MSRE projects, we asked them to reflect on what it means to be a McNair Scholar, as well as on their summer research experience and presenting at the virtual National

McNair Scholars Conference at UCLA. Some of their remarks are included on the following pages.

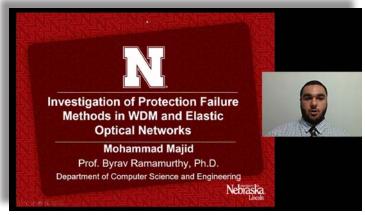


"At the end of the MSRE experience I was very confident in my research and explaining it to people who aren't familiar with my research topic, as well as people from my discipline. I am looking forward to what I can accomplish moving forward!" – Mahaa Albusharif



"Participating in the National McNair conference was a great experience for me. I felt very accomplished to present what I've been working on all summer in front of people, and I also learned how to be a good presenter, and how presenting is really just a conversation about your research."

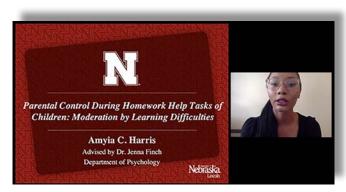
– Zoe Erickson



"A scholar is one that learns and allows failure because they use that failure as a learning opportunity to better measure and increase their understanding. The McNair Scholars Program allowed me to enhance my ability to become a better scholar, researcher, and presenter." – Mohammad Majid



"Participating in the McNair Scholars Program was likely one of the best things I have done during my collegiate years. Additionally, I know that the knowledge and experiences I have gained from this program will help me advance in my graduate and professional pursuits." – Miguel Avila Garcia

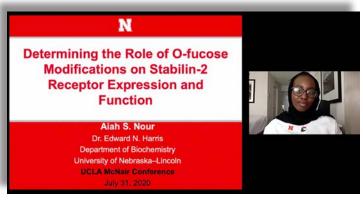


"I thought all it took to be a successful scholar was to be diligent and intelligent, but that is far from the truth when scholars have to perform during a global pandemic. Scholars need to be resilient, actively attentive, confident, and always willing to learn something new. Those are a few traits I gained while creating my project remotely with my mentor. MSRE was more than researching; it was about overall character development." – Amyia Harris



"Overall, participating in the McNair program, doing research, and presenting at UCLA has been an eye opening experience. These experiences helped me grow into a better scholar and I can use these experiences into graduate school." – Vivian Nguyen

McNair Scholars Driven by Passion for Research



"I am eternally grateful to be a McNair Scholar, and I can confidently say that this program is the defining experience of my college career in terms of intellectual growth. I have grown immensely and cannot wait until graduate school where I can put these skills to the test." – Aiah Nour



"The McNair Program has done so much more for me than growing my love for research and teaching me what it means to be a scholar. It has provided me with many opportunities that I am incredibly thankful for. It has taught me how to be more disciplined with my time, prepared me for graduate school, and introduced many hardworking and caring individuals into my life." – Adan Redwine

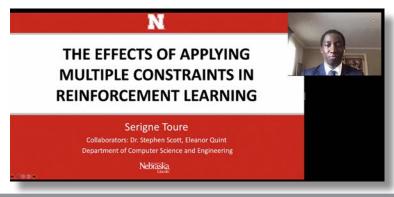
"The feeling of having an answer to your question was worth the time spent designing and testing experiments. Being able to work on something I am genuinely curious about makes the amount of work more fun than I thought it would be before I started and I feel like if I could redo it I would 100%." – Serigne Toure



"In addition to giving me more confidence to network with people and put myself in new situations, the MSRE experience also helped me discover my curiosity and passion for my research." – **Stephanie Perez**



"The MSRE assignments provided evidence of my capacity to learn and improve, which gave me confidence that I can achieve the goals that I have in life. In turn, the experiences I had this summer, because of McNair, made me more enthusiastic about doing research and going to graduate school." – Clarice Santos



Thank you to all of the faculty, postdoctoral, and graduate student mentors who contributed their time and expertise to work with McNair Scholars during the 2020 McNair Summer Research Experience and who continue to support the Scholars' research and graduate application efforts. Your support is invaluable to the success of our program!

Congratulations to December 2020 McNair Grads!



Taylor Billington

B.A., Physics

Bellevue, Nebraska



Logan Miller
B.A., Psychology
Palos Park, Illinois



Vivian Nguyen

B.A., Psychology

Omaha, Nebraska

2020-21 Postdoctoral & Grad Student Mentors

The McNair Graduate Student and Postdoctoral Mentoring Program offers our UNL McNair Scholars a supportive community, as well as advice, insight, and encouragement as they conduct research and prepare to enter graduate school. In turn, it offers our graduate mentors a chance to gain experience mentoring a rising scholar associated with one of the nationally-recognized Department of Education TRIO programs.

We'd like to welcome the 2020-21 McNair postdoctoral and graduate student mentors! They include: Kristlin Bright, educational psychology; and Kyle Dougherty, natural resource sciences; Colton Harper, computer science; Boyang Hu, computer science and engineering; Fei San Lee, biological engineering; Nasrin Naderi Beni, civil engineering; Ekta Pandey, biochemistry; Allura Ralston, clinical psychology; Ashley Toney, human sciences; and Josey VanOrsdale, sociology. They join continuing graduate mentors: Mengzhu Fu, psychology and Ben Hage, biological systems engineering.

Thank you for mentoring the next generation of graduate students!

Since the UNL McNair Scholars Program began in 1995, we've served 320 undergraduates. Excluding the continuing Scholars, 97.8 percent have earned their bachelor's degree, 145 have earned master's degrees, 50 UNL McNair Program alumni have achieved Ph.D.s, and 21 have earned professional degrees. Currently, 24 UNL McNair alumni are enrolled in Ph.D. programs, 14 are pursuing master's degrees, and 2 are pursuing professional degrees.

Scholars Awarded 2020-21 Research Grants

For the 2020-21 Academic Year, 11 UNL McNair Scholars received research funding from the Undergraduate Creative Activities and Research Experiences (UCARE) Program, as well as from other departmental funding.

Scholar	Project Title and Faculty Research Advisor
Miguel Avila Garcia	UCARE Project: Social Interactions of Songbirds and their Behaviors at Feeders Faculty Advisor: Dr. Dai Shizuka, School of Biological Sciences
Dorian Bobbett	Departmental Project: Faculty Adaptability and Community Engagement when Teaching in a Crisis Faculty Advisor: Dr. Grace Panther, Civil & Environmental Engineering
Zoe Erickson	UCARE Project: Assessing Project SAFE Effectiveness: Impact of Gender on Symptom Severity For Sexually Abused Youth Faculty Advisor: Dr. David Hansen, Department of Psychology
Evelyn Estrada Gonzalez	UCARE Project: The Well-Being and Parenting Behaviors of Parents in Early Childhood Faculty Advisor: Dr. Lisa Knoche, Center for Research on Children, Youth, Families & Schools
Logan Miller	UCARE Project: An Examination of the Flanker Effect in Virtual Reality Faculty Advisor: Dr. Mike Dodd, Department of Psychology
Aiah Nour	UCARE Project: Determining the Role of Protein O-Fucosyltransferase-1 in stabilin-2 receptor Expression in Human cells Faculty Advisor: Dr. Edward Harris, Department of Biochemistry
Stephanie Perez	UCARE Project: Assessing the Transport of Nano Plastics in Soil Horizons and Groundwater System Faculty Advisor: Dr. Shannon Bartelt-Hunt, Civil & Environmental Engineering
Adan Redwine	UCARE Project: Screening Neurotoxins for Selective Dieback of Pain-sensing Nerve Fibers from the Dorsal Root Ganglion Faculty Advisor: Dr. Rebecca Wachs, Biological Systems Engineering
Juliana Rodriguez	UCARE Project: Replication of Cerebral Circulation from Gerber Project in Vascular Phantom: Enhancing the Detection of Embolic Detection via Transcranial Doppler Ultrasound Faculty Advisor: Dr. Greg Bashford, Biological Systems Engineering
Clarice Santos	UCARE Project: Differences in Positive and Negative Affect among rural Persons Who Inject Drugs (PWID) in Puerto Rico who are in and out of Treatment Faculty Advisor: Dr. Patrick Habecker, Department of Sociology
Alyssa Simpson	UCARE Project: Constructing Novel van der Waals Heterostructures for High Performance Nanoelectronics Faculty Mentor: Dr. Xia Hong, Physics & Astronomy
Serigne Toure	UCARE Project: The Effect of Adding or Removing Constraints from a Reinforcement Learning Machine to find the Optimal Solution Faculty Advisor: Dr. Stephen Scott, Computer Science and Engineering

The McNair Program is a focused, comprehensive program that provides much more than advice on how to prepare for entrance to a graduate program. Participating Scholars become an integral part of a learning community, receiving support from each other, McNair Program staff, UNL faculty, and other resources as they develop the research skills they need to prepare for the next stage in their educational careers.

Scholars Share Research at Virtual Conferences

 \mathbf{M} cNair Scholars disseminated their research findings at local, regional, and national virtual conferences during Summer and Fall 2020.

Mahaa Albusharif - Albusharif, M, Wilson, M, Dasgupta M. (2020, August). The Role of Conformational Strain in Enzyme Catalysis. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Albusharif, M, Wilson, M, Dasgupta M. (2020, July). *The Role of Conformational Strain in Enzyme Catalysis*. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Albusharif, M, Wilson, M, Dasgupta M. (2020, July). *The Role of Conformational Strain in Enzyme Catalysis*. Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Miguel Avila Garcia - Avila Garcia, M, (2020, August). Investigating a Range Expansion Associated with Anthropogenic Alterations in Cope's Gray Treefrog (Hyla chrysoscelis) Utilizing Prey Selection Parameters. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Avila Garcia, M, (2020, July). Investigating a Range Expansion Associated with Anthropogenic Alterations in Cope's Gray Treefrog (Hyla chrysoscelis) Utilizing Prey Selection Parameters. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Avila Garcia, M, (2020, July). Investigating a Range Expansion Associated with Anthropogenic Alterations in Cope's Gray Treefrog (Hyla chrysoscelis) Utilizing Prey Selection Parameters. Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Zoe Erickson – Erickson, Z. (2020, July). An Increase in the Expression of Glycolysis Related Genes Correlates to Developing Preeclampsia. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Erickson, Z. (2020, July). An Increase in the Expression of Glycolysis Related Genes Correlates to Developing Preeclampsia. Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Amyia Harris – Harris, Amyia. (2020, August). Parental Control During Homework Help Tasks of Children: Moderation by Learning Difficulties. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Harris, Amyia. (2020, July). Parental Control During Homework Help Tasks of Children: Moderation by Learning Difficulties. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Harris, Amyia. (2020, July). *Parental Control During Homework Help Tasks of Children: Moderation by Learning Difficulties.* Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Mohammad Majid – Majid, M., Ramamurthy, B. (2020, September). *Investigation of Protection Failure Methods in WDM and Elastic Optical Networks*. 2020 MKN Heartland McNair Virtual Research Conference.

Majid, M, Ramamurthy, B, Ph.D. (2020, August). *Investigation of Protection Failure Methods in WDM and Elastic Optical Networks*. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Majid, M, Ramamurthy, B, Ph.D. (2020, July). *Investigation of Protection Failure Methods in WDM and Elastic Optical Networks*. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Majid, M, Ramamurthy, B, Ph.D. (2020, July). *Investigation of Protection Failure Methods in WDM and Elastic Optical Networks.* Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Vivian Nguyen - Nguyen, V. (2020, August). Associations Between Job Loss and Parental Mental Health and Parenting Behavior During the COVID-19 Pandemic. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Nguyen, V. (2020, July). Associations Between Job Loss and Parental Mental Health and Parenting Behavior During the COVID-19 Pandemic. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California—Los Angeles, Los Angeles, California.

Nguyen, V. (2020, July). Associations Between Job Loss and Parental Mental Health and Parenting Behavior During the COVID-19 Pandemic. Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

More 2020 Virtual Conference Presentations

Aiah Nour – Nour, Aiah S., Harris, E.N. (2020, August). Determining the Role of O-fucose Modifications in Stabilin-2 Receptor Expression and Function in Human Cells. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Nour, Aiah S., Harris, E.N. (2020, July). Determining the Role of O-fucose Modifications in Stabilin-2 Receptor Expression and Function in Human Cells. Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Nour, Aiah S., Harris, E.N. (2020, July). Determining the Role of O-fucose Modifications in Stabilin-2 Receptor Expression and Function in Human Cells. Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Stephanie Perez - Perez, S., Bartelt-Hunt, S., Naderi, N. (2020, August). Investigating and Efficient Method for Extracting Microplastics from Soil/Sediment Samples. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Perez, S., Bartelt-Hunt, S., Naderi, N. (2020, July). *Investigating and Efficient Method for Extracting Microplastics from Soil/Sediment Samples.* Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Perez, S., Bartelt-Hunt, S., Naderi, N. (2020, July). *Investigating and Efficient Method for Extracting Microplastics from Soil/Sediment Samples*. Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Adan Redwine – Redwine, Adan, San Lee, F. Wachs, R. (2020, August). Development of Physiologically Relevant Model of Sensory Nerve Growth to Screen Pain Therapeutics. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska-Lincoln, Nebraska.

Redwine, Adan, San Lee, F. Wachs, R. (2020, July). Development of Physiologically Relevant Model of Sensory Nerve Growth to Screen Pain Therapeutics. Oral presentation at the 2020 National McNair Scholars Virtual Conferences at UCLA, University of California-Los Angeles, Los Angeles, California.

Redwine, Adan, San Lee, F. Wachs, R. (2020, July). Development of Physiologically Relevant Model of Sensory Nerve Growth to Screen Pain Therapeutics. Oral Presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Clarice Santos - Clarice Santos - Santos, C., Habecker, P. (2020, September). *Unsterile Needle Acquisition Among PWIDs in Rural Puerto Rico: A Comparison Between Those in and out of Treatment.* 2020 MKN Heartland McNair Virtual Research Conference.

Santos, C. (2020, August). *Unsterile Needle Acquisition Among PWID in Rural Puerto Rico: A Comparison Between Those in and out of Treatment*. Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Santos, C. (2020, July). *Unsterile Needle Acquisition Among PWID in Rural Puerto Rico: A Comparison Between Those in and out of Treatment.* Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California-Los Angeles, Los Angeles, California.

Santos, C. (2020, July). Unsterile Needle Acquisition Among PWID in Rural Puerto Rico: A Comparison Between Those in and out of Treatment. Oral Presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska-Lincoln, Lincoln, Nebraska.

Toure, Serigne – **Toure, S.** (2020, August). *The Effects of Applying Multiple Constraints to a Reinforcement Learning Agent.* Poster presented at the 2020 Nebraska Summer Research Virtual Symposium, University of Nebraska–Lincoln, Lincoln, Nebraska.

Toure, Serigne (2020, July). *The Effects of Applying Multiple Constraints to a Reinforcement Learning Agent.* Oral presentation at the 2020 National McNair Scholars Virtual Conference at UCLA, University of California–Los Angeles, Los Angeles, California.

Toure, Serigne (2020, July). *The Effects of Applying Multiple Constraints to a Reinforcement Learning Agent.* Oral presentation at the 2020 McNair Summer Research Virtual Colloquium, University of Nebraska–Lincoln, Lincoln, Nebraska.

McNair Alumni Earn Advanced Degrees

 $oldsymbol{C}$ ongratulations to these UNL McNair alumni who recently earned advanced degrees!

Doctoral degree

Reinaldo Alcalde, Ph.D. (*McNair Scholar 2010-13*) earned a master's degree in environmental engineering from the University of Illinois at Urbana-Champaign in December 2014 and earned a Ph.D. in environmental engineering at The University of Texas at Austin in December 2020. Dr. Alcalde is a postdoctoral scholar at the California Institute of Technology working in the Division of Biology and Biological Engineering.

Master's degree

Karina Pedroza (*McNair Scholar 2010-12*) earned a master's degree in management with an emphasis in leadership from Briar Cliff University in October 2020. Karina is currently a financial aid counselor at Briar Cliff University in Sioux City, Iowa.

Alumni Publications

Shout out to these UNL McNair alumni on their recent publications:

Kiley Gilbert - Willis-Esqueda, C. & Gilbert, K. (in press). Are exonerees ever exonerated? Albany Law Review.

Daniel Anthony Rico - Rico, D.A., Detweiler, C., Muñoz-Arriola, F. (2020). Power-over-Tether UAS Leveraged for Nearly-Indefinite Meteorological Data Acquisition. 2020 ASABE Annual International Virtual Meeting. *American Society of Agricultural and Biological Engineers*. 2001345 (doi:10.13031/aim.202001345).

Megan Smith–Smith, M. D., Robinson S. L., Molomjamts, M. and Wackett, L. P. (2020) In vivo assay reveals microbial OleA thiolases initiating hydrocarbon and β-lactone biosynthesis. mBio. 11(2) e00111-e00120.

Robinson S. L., **Smith, M. D.,** Richman J. E., Aukema K. G., Wackett, L. P. (2020) Machine learning-based prediction of activity and substrate specificity for OleA enzymes in the thiolase superfamily. *Synbio* 5(1):ysaa004.

Robinson, S. L., Terlouw, B. R., **Smith, M. D.,** Pidot, S. J., Stinear, T., Medema, M. H., Wackett, and L. P. (2020)Global analysis of adenylate-forming enzymes reveals β -lactone biosynthesis pathway in pathogenic *Nocardia*. JBC doi: jbc.RA120.013528.

McNair Alumni — keep us informed as you advance through your career, including progress in graduate school, publications, and other milestones. You may update your information at any time:

http://www.unl.edu/mcnair/scholarupdate.shtml



