# MCNAIR SCHOLARS PROGRAM

CLEVELAND STATE UNIVERSITY 1964

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## ABOUT THE RONALD E. MCNAIR SCHOLARS PROGRAM

The McNair Scholars Program is named after the late Dr. Ronald E. McNair, an African American physicist and NASA astronaut who perished in the explosion of the Challenger space shuttle in 1986.

Federally sponsored by the U.S. Department of Education, the program prepares participants for graduate programs through involvement in research and other scholarly activities.

The participants demonstrate strong academic potential, especially in the STEM disciplines. They are first generation college students from economically disadvantaged backgrounds, or hail from underrepresented groups in higher education.

TRIO

RONALD E. MCNAIR POST-BACCALAUREATE ACHIEVEMENT PROGRAM

# A MESSAGE FROM THE DIRECTOR

## DR. ÁNGEL REYES-RODRÍGUEZ

The McNair Scholars Program supports exceptional students who are preparing for pursuing doctoral and master's degrees. Like everyone else, we had several unexpected challenges during the 2019-2020 Academic Year, including a pandemic and its consequences. But we persevered, inspired by the hard work and tenacious spirit of our scholars.

Last year, our scholars participated in 12 workshops and seminars, 6 cultural events, 1 national conference, and 1 local research presentation. 13 tenacious scholars participated this year in our first-ever Virtual Summer Research Institute. 11 scholars graduated with their bachelor's degree from Cleveland State University, more than half enrolling in graduate programs this Fall. We are proud of our scholars and their accomplishments.

We are also looking forward to the 2020-2021 academic year. We continue working with our current scholars as they prepare for applying to graduate schools. But we are ready to help new students too! If you or someone you know is planning on going to graduate school, reach out to us. We might be able to help. We are recruiting the next group of students to be admitted into the McNair Scholars Program. We are ready to help more students prepare for a graduate program in their disciplines, foster relationships between them and our dedicated faculty mentors, and support them by offering the opportunity to work on research projects in their fields.

We are still physically apart. But the McNair Scholars Program still is a community of support for the students we serve. We are determined to support more of our gifted students as they pursue their goals and take the steps needed to make their dreams come true.

**Ángel L. Reyes-Rodríguez**
Director
McNair Scholars Program

# WELCOME NEW & RETURNING SCHOLARS!

## New Scholars:

Kylie Armstead - Speech & Hearing

Janel Craig - Marketing

Hannah Tackett - Psychology & Pre-Occupational Therapy

## Returning Scholars:

Ola Abuhamdeh
Tatiana Ally
Andrea Arnold
Quendresa Demiri
Mikyla Gary
Maria Habean
Michail Haswani
Juwan Lee
Jemima Kennedy
Lamar McCornell
Alexis Merk
Mohamed Najjar
Briana Nichols
Jasline Rosario
Camilya Williams

# 2020 MCNAIR SUMMER RESEARCH INSTITUTE

*The McNair summer research institute (SRI) is an intensive summer research opportunity offered to McNair scholars. Part of the SRI includes the scholars spending ten weeks conducting research projects with their faculty mentors. Normally scholars are expected to present their final products at CSU research day, however this year research day has been canceled due to COVID-19. We still would like to show off the hard work our scholars and their mentors have done this summer, so please enjoy our scholars abstracts!*
**Scholar name underlined*
***Faculty mentor name denoted by two asteriks*

## Determination of Lithium Ions in E-Cigarettes Using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) Technique

*Folk, Kevin; Leibold, Rebecca; Abuhamdeh, Ola; Boron, Mallorie; O'Connor, Anne, Ph.D.***
*Chemistry Department, Cleveland State University, Cleveland, Ohio*

Electronic cigarettes (e-cigarettes) are nicotine devices that is made up of a power source (battery) and a heating element that both work to stimulate the vaporization of a flavored solution. This is then inhaled by the user. While e-cigarettes lack many of the toxic chemicals in tobacco cigarettes, their effects to human health remain unknown. This study aims to determine whether harmful oxidants are produced in electronic cigarettes using lithium batteries. For this purpose, reactive oxygen species (ROS) reactivity in the disposable components of Electronic Nicotine Delivery Systems (ENDS) associated with e-cigarette aerosols was analyzed by comparing new lithium ion battery in an e-cigarette versus a two-year old lithium-ion battery. Vapor collected through a water gravity vacuum method mimicking the vapor inhaled by an individual were analyzed by inductively coupled plasma - optical emission spectrometry ICP-OES. The results suggest there are lithium ions present in the vapor that the user inhales. Ola's main role in the research was to edit and prepare the paper as well as the experimental data for publication.

## Understanding Sexual Health Information Access for Gender Minority Adolescents with Qualitative Focus Groups

*Arnold, Andrea; Naser, Shereen, Ph.D.***
*Department of Psychology, Cleveland State University, Cleveland, Ohio*

Access to proper sexual-based information is widely inclusive for the youth a part of the LGBTQ+ community. Due to this, many of these young adults are turning to social media to learn the information school-based sexual education is not discussing. To help fill the gap between social media platforms and health, we hypothesized that the observation of the LGBTQ+ youth and young adults will use multiple social media platforms to seek sexual health information and connect with other LGBTQ+ individuals. The current study consisted of three LGBTQ+ youth examining and describing their experience with school-based sexual education and how social media has played a role in this. In order to do this, we conducted a focus group meeting on Zoom that is approximately 60 minutes long, asking relevant health and social media questions. Anticipated results indicated that we will have a better understanding of how LGBTQ+ youth and young adults interact with sexual health information in social media spaces and how that determines their health and development.

**Systematic Review: Physician Benefits and Challenges using Health Information Exchange**

*Demiri, Quendresa: Porter, Tracy, Ph.D.* **
*College of Health Sciences, Cleveland State University, Cleveland, Ohio*

Health Information Exchange (HIE) "allows doctors, nurses, pharmacists, other health care providers and patients to appropriately access and securely share a patient's vital medical information electronically" (HealthIt, 2020). The use of HIE's is currently rising to improve medical decision making, be more cost effective, and improve the health of patients. Given that HIEs constantly evolve, it is important to understand how those changes alter outcomes. The purpose of this study is to review the benefits and challenges of the HIE currently implemented by physicians. To this purpose, a literature review of HIE was employed. Keywords were used to render thousands of articles. After excluding duplicates or not pertaining to health care articles, 716 articles were selected and labeled "Yes" for systematic review and analysis. Results from reviewing the articles indicated similarities between most of the articles. The topics of cost, security, and decision making were mentioned in most of the articles reviewed.

**EKLF mediated regulation of cytokinesis, erythroid enucleation, and megakaryopoiesis during terminal differentiation and congenital dyserythropoietic anemia**

*Habean, Maria*; Gnanapragasam, Merlin, Ph.D.**
*Department of Chemistry, Department of Biological, Geological, and Environmental Sciences, Cleveland State University, Cleveland, Ohio*

Terminal differentiation in erythroid cells culminates in enucleation, a type of cytokinesis, where the nucleus is expelled from the cell. Improper cytokinesis and enucleation is due to a mutation in Erythroid Krüppel-like Factor (EKLF), an erythroid transcription factor, leading to Congenital Dyserythropoeitic Anemia IV (CDA's) whose pathway remains to be understood. If EKLF is knocked out of mouse erythroid cells, the cells exhibit a failure in cytokinesis and enucleation with more megakaryocyte production. EKLF does have a role in allowing megakaryocyte erythroid cells to enter into erythropoiesis if the megakaryopoiesis genes are suppressed. Although, it is unknown if EKLF suppress megakaryocyte genes directly. I hypothesized that EKLF regulates genes involved in cytokinesis, enucleation, and multinucleation in megakaryocytes, and the failed regulation in erythroid EKLF null mouse cells and CDA IV patients leads to failures in cytokinesis and enucleation and a binucleate cell phenotype. A literature search was conducted to learn about genes involved in cytokinesis and enucleation in erythroid cells and whether those genes play a role in CDA's and multinucleation in megakaryocytes. Comparison of the data from the RNA sequence of EKLF +/+ and EKLF -/- mouse cells with genes that are pertinent for megakaryopoiesis may lead to the discovery of a subset of megakaryocyte genes that are abnormally expressed in EKLF-/- cells. Overall, our study shows that when the regulation of genes that contains the multinucleated phenotype in megakaryocytes are misregulated the end result can lead to a failure in cytokinesis, a binucleate phenotype and enucleation defects.

**Effects of the Dysregulation of PANCR Regarding the PITX2 Gene in the Eye**

*Najjar, Mohamed; Gore Panter, Shamone, Ph.D.***
*Department of Biological, Geological, and Environmental Sciences, Cleveland State University, Cleveland, Ohio*

The PITX2 adjacent noncoding RNA (PANCR) is an intergenic long noncoding RNA adjacent to the PITX2 gene. The PITX2 gene functions as a regulator for bilateral symmetry during development. PANCR is only expressed in the left atrium of the heart and in the eye in humans. PANCR has been studied with its effects in atrial fibrillation in the heart, but very little is known about its expression in the human eye. This project hypothesizes that the dysregulation of PANCR, which causes mutations in the PITX2 gene, will cause deformities to the human eye, similar to those of Axenfeld-Rieger Syndrome, a disease effecting the development of the eye by mutations of the PITX2 gene.

**Use of Optical Tweezers and Trapping Cilia**

*Alexis Merk, Andrew Resnick, Ph.D.***
*Department of Physics, Cleveland State University, Cleveland, Ohio*

Cilia are microtubule-based sensory organelles that cells use to gather information. These cilia are non-motile and reside in the renal system of humans. Their sensors are used to detect fluid flow and allow epithelial tubes to respond and function normally. Irregularities in these organelles can be linked to many kidney diseases. The goal of our research is to better understand cilia and their sensory outputs. In order to study cilia sensory outputs, optical tweezers are used to view and trap cilia given their ability to elicit and record responses from cilia and plot the given data. Trapping cilia is one of the most effective ways to gather information about cilia and allows researchers to explore cells methodically. . The ability to correct cilia defects could lead to cures for many different kidney diseases.

**The Role of Intergenerational Mentoring As a Tool for Matriculation of Minoritized Womxn in Higher Education Completion**

*Williams, Camilya; Arki, Shemariah, Ph.D.***
*Black Studies and Social Work, Cleveland State University, Cleveland, Ohio;*
***Flora Stone Mather Center for Women, Case Western Reserve University, Cleveland, Ohio*

White and minority students enroll in college at similar rates, however, completion rates for minority students is lower than for white students. Discrimination, implicit biases, sex, and socioeconomic status are factors linked to this disparity. There is a need to identify innovative solutions to bridge this gap. For this we performed a literature review to identify trends to achieve equity in education. We identified intergenerational mentoring as a viable alternative. According to authors Satterly et al., (2018), "This model reflects the positive aspects of reverse mentor-ing without the hierarchical framework of mentor and mentee; rather, it is based upon the notion that everyone leads, and everyone learns." Further work is needed to explore the role of intergenerational mentoring in the success of the matriculation of higher education completion for minoritized womxn.

**Empowering women: An examination of how the activism of Kathleen Cleaver, Elaine Brown, Erica Huggins and Angela Davis transformed the Black Panther Party**

*McCornell, Lamar; Thomas Bynum, Ph.D.***
*Department of Black Studies, Cleveland State University, Cleveland, Ohio*

The Black Panther Party (BPP) was a socialist, political organization that protected and served African American communities in the United States. The BPP focused on protecting communities against police brutality in the 1960s and 70s, as well as on providing community services in the 1970s-80s. While females were a large percentage of the party's membership, the BPP has been historically perceived as an ultra masculine organization and the roles of women in its leadership have been underexplored. In this study, published works and historical documents were used to explore the dynamics of the leadership of women in the BPP, such as Erica Huggins, Angela Davis, Kathleen Cleaver, and Elaine Brown. As many of the male leaders were imprisoned, females made advances and pushed the BPP in a direction that was not often highlighted. Although the women were resilient and showed their value to the revolutionary organization, gender bias and the sexist views from male leaders made it a continuous struggle to move forward. The social order was a major contributor to the downfall of the organization. All together, this study illustrates the essential roles women played in the BPP in the contexts of a social heirarchy that challenged their authority.

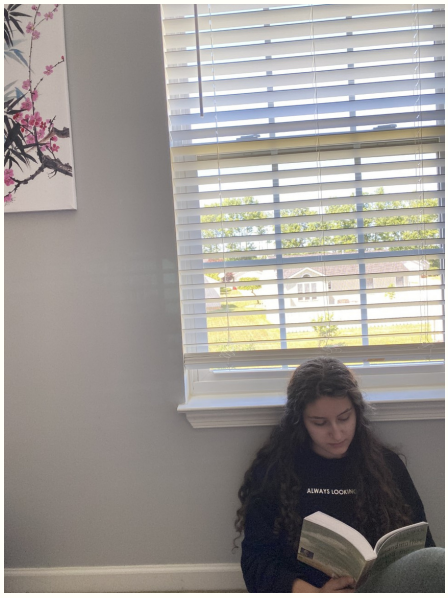
**Ohio County's level of Coronavirus cases in relation to Demographic Characteristics**

*Haswani, Michail; Yongjian Fu, Ph.D.***
*Computer Engineering, Electrical Engineering and Computer Science, Cleveland State University, Cleveland, Ohio*

COVID-19, the disease caused by the novel coronavirus SARS-CoV-2, was first described in Wuhan, China in 2019. Since then, it has become a pandemic. There are several factors that likely contribute to its rapid spread. This study examined the correlations between different demographic characteristics and the number of COVID-19 cases and deaths, by investigating data in the 88 counties of Ohio. We searched for credible sources that include the demographics and the COVID -19 data, including land area, population, age, education level, unemployment rate and income, and the number of cases and deaths of COVID -19. Results showed a strong correlation between the population size and the number of cases and with the number of deaths. Moreover, the correlation is high for the population in all age groups, which seems to indicate the COVID -19 infects counties similarly regardless of their age group composition. However, since we were unable to obtain the breakdown of the number of cases and deaths in various age groups, further study is needed to investigate the effects within various age groups. Additionally, the analysis identified a moderate correlation between the education level and the number of cases and deaths. Finally, we did not find correlation between other characteristics including land area, unemployment rate, and income, and the number of cases and deaths.

# SUMMER SOCIALLY DISTANCED CULTURAL EVENT: BOOK READING!

To honor the current pandemic, McNair Scholars chose from a series of books and did what scholars do best: read!





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## CALENDAR OF EVENTS

09/01 | 11:30 AM
Craft an Effective CV | Kyle Znamenak

10/06 | 11:30 AM
Write an Effective Statement of Purpose | Dr. Mary McDonald

11/03 | 11:30 AM
Getting good letters of Recommendation | TBD

11/03 | 11:30 AM
Research Methods for New Scholars | TBD