



HLC Accreditation 2016-2017

## **Evidence Document**

---

TRIO

McNair Scholars Program

---

## **Journal of Research Reports 2014-2015 Volume 20**

---

**Additional information:**



**MCNAIR SCHOLARS PROGRAM**

McNair Scholars Program Home

About Us ▾

Prospective Scholars

Calendar

Forms

McNair Scholars Library Guide

Alumni

Annual Closing Symposium

McNair Research Journals

Newsletters

Program Highlights

Doctorate Recipients

PRE-M Academy

**IN THE NEWS**

"The Doctor" Newsletter

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields@wichita.edu



**MCNAIR SCHOLARS PROGRAM**  
**A TRIANGLE OF SUCCESS**  
**2014 - 2015 JOURNAL OF RESEARCH REPORTS**  
VOLUME 19

[A Letter from the Director](#) // LaWanda Holt-Fields

**Research Abstracts**

- Alissa Bey

[Religiosity and Sexual Shame among Young Women](#)

- Kevontrez Jones

[An Experimental Study of Fiber Architecture Effects on the Stress Relaxation Behavior of Carbon Fiber Composites](#)

- Lindsey Stillwell

[A Lost History: A Digital Ethnography of the Historic Dunbar Theatre](#)

- Logan Gisick

[Investigating Guiding Attributes in Visual Search for Medication Vials](#)

- Anna Wray

[Exploring Informal Sources of Information and Women's Use of Preconception Health Services](#)

- Ayris Franklin

[Effectiveness of The Listening Program® in Children](#)

- Lydia Ibarra

[A Community Needs Assessment of Premarital Education](#)

- Jasmine Mayorga

***pH Sensitive Conformational Change Monitored by Tryptophan Quenching of Fluorescence***

- Jose Esquivel

***Considerations When Designing an Exoskeleton Prosthetic Hand***

- Joy Foster

***Wichita State University Students' Perceptions of Police and the Effects of the Media***

- Julie Mahomed

***A New Porcine Follicle-stimulating Hormone Glycoform as a Potential Candidate for Superovulation in Animals.***

- Khoi Lam

***Differences in Human Gait while Carrying a Load at Different Positions on the Back***

- Martina Salerno

***Laser Surface Treatment to Enhance Biointegration of Orthopedic Implants***

- Zachary Pearson

***Characterizing Boundary Conditions of Self-Adjoint Operators***

---

---

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 12:22:03 PM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

A-Z | Policies and Procedures | Notice of Nondiscrimination | Campus Safety | RSS Feeds | Contact Wichita State University  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by  Google Translate

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us ▶](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu

# A Letter from the Director

It is indeed a pleasure to serve as the director of the Ronald E. McNair Post-baccalaureate Achievement Program. The academic year of 2014 – 2015 has been an exciting and fruitful year for the students whom we serve. Fourteen students completed research activities this year, 12 McNair Scholars and two EPSCoR Scholars; topics ranging from “Design of an Exoskeleton Device” to “Porcine Hypo-glycosylated Follicle-Stimulating Hormone.” Each of these students completed over 200 hours of research work outside of the classroom. They have made a true commitment to their education and seeking out the things that lie ahead. I commend them for all of their hard work and share my gratitude with the faculty members who made the effort to work with each Scholar and push them toward success.

Thank you to the WSU community, faculty, staff and administrators for sending excellent students our way. We all work together for the common goal of student success. To the McNair staff: Ashley Cervantes, Maria Lucas, Matthew DeAngelis and Noah Trammell, your commitment and support has been unwavering and I thank you.

Lastly, the staff and I thank Ms. Deltha Q. Colvin for her trust and support in all that we do to serve these students who have been entrusted into our care. Your vision and guidance is much appreciated.

I look forward to continued success with the McNair Program and the students that we serve. Thank you for going above and beyond the classroom to do great work.

[LaWanda Holt-Fields](#)

## [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:33:41 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



# "Religiosity and Sexual Shame among Young Women"

By Alissa Bey

## Abstract

Many religious teachings, particularly those from Judeo-Christian traditions, have commonly taught abstinence until marriage. Because religious doctrine is more inclined to address female sexuality negatively, females are shown to hold more sexual shame than their male counterparts (Daniluk, 2008). The purpose of this study was to examine how adolescent religiosity influences young women's attitudes toward sex and birth control in adolescence, as well as contraceptive behavior in adulthood. Secondary analysis was conducted for this study using the National Longitudinal Study of Adolescent Health (Add Health), which is a nationally representative, longitudinal study, conducted between 1994 and 2009 using adolescents in the U.S. who were in grades 7 – 12 in 1994 – 1995. Analyses were conducted based on a sample of 6,503 young women in the Add Health study. We hypothesized that higher levels of adolescent religiosity would be associated with higher levels of sexual shame, more perceived obstacles to birth control, and lower expectations of sexual pleasure. Results of this study demonstrate that religiosity is significantly associated with young women's sexual attitudes. Young women reporting higher levels of overall religiosity and fundamentalist beliefs also reported higher levels of sexual shame. This research implies that adolescent fundamentalist beliefs may be a key factor in predicting sexual attitudes, making fundamentalist belief an important dimension of religiosity to examine when researching overall sexual well-being. This study should encourage future researchers to examine other connections that fundamentalism may have on young women's sexuality in order to explore their overall sexual well-being.

## [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:05:09 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



*"An Experimental Study of  
Fiber Architecture Effects on  
the Stress Relaxation Behavior  
of Carbon Fiber Composites"*

*By Kevontrez Jones*

### Abstract

This study examines the effects of reinforcement architecture on the stress relaxation behavior of polymeric composites. Stress relaxation of the matrix or the polymer dominates the composite relaxation behavior. Even under simple states of stress, such as the uniaxial case, the relaxation characteristics of reinforced polymers are drastically different than those of a pure polymer sample; thus, the homogenized global stress fields cannot be used to predict the relaxation of composites using simplistic mixtures models. To address this issue, flexural stress relaxation behavior of 5320-1 epoxy resin was measured and then compared with that of two carbon fiber reinforced (5320 Unidirectional and 5320-8 Harness) composites that utilized the same resin as their matrix. Measurements were taken across several degrees of polymerization at elevated temperatures below the glass transition temperature of the materials. The principle of time-temperature superposition held, and master curves were generated by manually shifting the data and calculating the shift factors. In all cases, unidirectional composite exhibited the least relaxation, while the relaxation in 8 Harness fabric reinforced composite exceeded or approached that of the pure epoxy resin. This data is currently being used to develop correction factors for rule of mixtures models. Hence, the experimental data can be used to make mathematical models that can characterize the stress relaxation behavior of a broader range of composite systems used for structural support.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:33:08 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us ▾](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



## *"A Lost History: A Digital Ethnography of the Historic Dunbar Theatre"*

*By Lindsey Stillwell*

### Abstract

This research explores sense of place and generational values of an African American cohort from Wichita, Kansas. The cohort attended the Historic Dunbar Theatre following its opening in 1941 and through its 22-year operational period. Participants shared memories and feelings about their experiences in the community at the only fully integrated movie theatre during legalized segregation in Wichita. Utilizing digital storytelling as a qualitative method, researchers employed narrative inquiry and semi-structured interviews to elicit individually lived experiences and memories in the community from the cohort. Results indicated a strong sense of place among participants, reinforced by a sense of belongingness and generational values that emphasize the importance of community and human relationships. Implications for the use of digital stories in the community as a means to achieve social justice are explored. Digital storytelling is an emerging method of qualitative research, and this study elucidates how social workers and other community-based disciplines can engage African American communities to bring about a more Afrocentric perspective of their community's history. This study engages in critical reflection of those events with the added benefit of preserving oral history that might otherwise be lost for future generations.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:34:01 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us ▾](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



## *"Investigating Guiding Attributes in Visual Search for Medication Vials"*

*By Logan Gisick*

### Abstract

Medical professionals must select from a vast array of medication vials to dispense the correct medication to a patient. The vials are often small and highly similar, potentially increasing the chance of committing a medical error. Over 400,000 people die every year due to medical errors according to recent studies; a third of which are thought to be medication related. We studied the visual characteristics of medication vial labels to identify properties leading to the fastest and most accurate search. In a visual search task, participants located a target vial among an array of similar looking vials whose labels varied along a set of specific attributes (color density, text size and text orientation). Based on our data which examines response times and accuracy, we found that participants were faster and more accurate at finding vials with high color density and vertical text orientation, with the exception that when the text was large, there was no significant difference between these factors. Our research indicates that guiding attributes previously identified in basic visual search studies do in fact predict performance in search for medication vials.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:34:16 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Select Language

Powered by [Google Translate](#)



[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



*"Exploring Informal Sources of  
Information and Women's Use  
of Preconception Health  
Services"*

*By Anna Wray*

### Abstract

Preconception care refers to a set of interventions that aims to modify and reduce risks to women's health during childbearing years, increasing healthy behaviors in women and reducing the risks of birth defects and infant mortality. Prior research suggests that various cultural and social factors may play a role in women's views and beliefs about preconception care. Findings from an extended literature review revealed that women often receive information from culture, family, and friends in the form of suggestions and advice. In addition, media, particularly the internet, is a major source of information for women regarding preconception care. Further, an understanding of the informal and formal sources of information that women use to make decisions about using preconception health services is key to engaging, informing, and educating women. For the present study, focus groups were conducted with 40 reproductive-age women in Kansas. The purpose of this study was to identify the informal information sources that influence's women's decisions about using preconception health services. The preliminary findings from this study will be presented; and the limitations and directions for future research focused on women's preconception care will be discussed.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:31:32 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



## "Effectiveness of the The Listening Program in Children®"

By Ayris Franklin

### Abstract

The purpose of this study is to measure the effectiveness of The Listening Program® (TLP). Seven children with various types of developmental disabilities (e.g. Autism Spectrum Disorder, Speech and Language Disorders, intellectual disability) participated in a 12-month longitudinal study using TLP®. TLP® is a popular sound therapy program in which a child listens to acoustically modified classical music for 15-30 minutes per day with the expectation that the listening will improve brain function. A Single-subject design was employed in which auditory speech and language behaviors were documented with video tapes and questionnaires completed by the child's parent before, during, and after daily administration of the listening program over one year. While previous research has indicated the effectiveness of TLP®, the researchers were affiliated with TLP®. Data from this initial project will be examined by people unaffiliated with TLP® in our study to avoid any potential bias. The goal of this study is to test the researchers' hypothesis that auditory speech and language behaviors will improve after administration of TLP®. This will be one of the first systematic research studies to measure the effectiveness of TLP® in children with developmental disabilities that was not conducted by developers and distributors of TLP®. This study can support or discount the research done by TLP® and give caregivers or health care professionals another perspective when deciding if TLP® is the best treatment option for their client.

### [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:31:58 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us ▶](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



*"A Community Needs  
Assessment of  
Premarital Education"*  
*By Lydia Ibarra*

### Abstract

For centuries, marriage has been rich in both cultural and religious tradition. According to the Pew Research Center (2014), 82% of married individuals identify as holding a religious affiliation. Marriage and divorce are regulated by legal policies, and religious bylaws also structure and shape practices within a congregation. The religious community has been influential in shaping public policy advocating for covenant marriage licenses and a return to fault-based divorce, but limited research studies have explored the circumstances in which divorce is permissible across religious denominations. When divorce and remarriage is acceptable in a religion, applicants are subject to the procedures within the corresponding religious denominations. According to the 2015 Census, in 42% of couples marrying within the past year, one or both partners entering the marriage had been previously married. Despite premarital education being a key provision of covenant marriage, little is known about faith-based marriage education, especially programs offered to remarried couples forming stepfamilies. This study involved a community needs assessment exploring the grounds for divorce and remarriage across denominations. The research also explored whether religious adherence influenced premarital practice and attitudes amongst college students. This study sought to enlighten the religious community about the need for premarital education that is specific to the needs of the couple forming a stepfamily.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:34:33 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



*"pH Sensitive  
Conformational Change  
Monitored by Tryptophan  
Quenching of Fluorescence"*  
*By Jasmine Mayorga*

### Abstract

Anthrax toxins are the main virulence component in bacterium *Bacillus anthracis*, a lethal agent for livestock and humans. *Bacillus anthracis* is composed of several polypeptide chains: the receptor-binding moiety protective antigen (PA) and Enzymatic moieties lethal factor (LF) and edema factor (EF) (Pilpa, Bayrhuber, Marlett, Reik, & Young, 2011). This study examined the PA membrane and the expanding pores with emphasis on the mechanism of the pre-pore to pore formation of mutant protein D425A in comparison to wild type protein A350; a fluorospectrometer reading was used to measure the effects of the pH on the mutant protein, and then the reading was compared to that of the wild type protein. The kinematics approach was used to measure the rate of transition of the proteins from pre-pore to pore. Recent findings suggest that PA intermediates as mechanisms for pre-pore to pore formation. The details of how the PA pre-pore to pore mechanism forms an intermediates and translocates toxins are not yet known. In our lab we incorporated single tryptophan residues into the peptide segments that play key roles in the conformational change in the D425A mutant and the A350 wild type protein. This allowed us to explore the pH stability of anthrax Protective Antigen to figure the conformational changes on the PA. The results of this study will give scientists a better understanding of Anthrax toxins, with the data contributing to the development of a new therapeutic.

### [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:32:13 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

[Select Language](#)Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



## *"Considerations When Designing an Exoskeleton Prosthetic Hand"*

*By Jose Esquivel*

### Abstract

Paralysis is a serious medical diagnosis that can result from stroke, birth defects, or injuries to the spinal cord. Once the synapse connection of the spinal cord is broken, communication between the nervous system and the body is severed. As a result, motor function in the human body is significantly reduced or completely eliminated. Many people who suffer from paralysis can benefit from exoskeleton prosthetics. Similarly, prosthetic limbs can assist patients who have had amputations due to diabetes, military service, or severe injuries. These amputations affect the patient's ability to perform everyday activities. Information pertaining to prosthetic limbs can also be incorporated into exoskeleton designs. These contributions have led to the study of biomechanics. The purpose of this extended literature review was to collect data and assess literature that can assist in building a functional exoskeleton hand. Many factors affect hand movement. This study provides information that can be utilized to engineer an exoskeleton more accurate in mimicking the movements of a human hand. Having a more accurate exoskeleton or prosthesis will eliminate many problems between the user and the machine, thus making the mechanism more user friendly.

### [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:32:25 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



## *"Wichita State University Students' Perceptions of Police and the Effects of the Media"*

*By Joy Foster*

### Abstract

Over the past few years, police behavior has come under national scrutiny. News agencies tend to report only negative police behavior with continuous coverage of police misconduct. In contrast, crime-reality and crime-fiction shows portray police as heroic, which can leave citizens' opinions somewhere in between. This study assessed selected WSU students' perceptions of the police before and after a controlled contact with a police officer. Students who are currently enrolled at Wichita State University were chosen by random selection for this study. Each participant was asked to partake in a pre- and post-semi-structured qualitative interviews with the researcher about their perceptions of the police, with the post interview being conducted after participants attended an open forum discussion with an officer from the Wichita Police Department. This research investigated the role the media plays in shaping students' perceptions of the police to determine whether or not informal contact with a police officer would have a positive effect on peoples' perceptions of police. This research will provide insight into the relationships between the police and media, the media and community, and the police and the community as a whole.

### [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:32:37 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



*"A New Porcine Follicle-  
Stimulating Hormone Glycoform  
as a Potential Candidate for  
Superovulation in Animals"*

*By Julie Mahomed*

### Abstract

Follicle-stimulating hormone (FSH), a pituitary glycoprotein, plays a central role in reproduction in humans and animals. In females, it acts on ovarian follicles producing mature oocytes at ovulation. Glycosylation variants of FSH show different bio-activities. Hypo-glycosylated hFSH<sup>21</sup> is more active than fully-glycosylated hFSH<sup>24</sup>, but its blood concentrations are going down during aging, as fertility decreases in women. FSH glycoforms have been observed largely in primates, including humans, rhesus monkeys, and Japanese macaques. Ovine, porcine, and bovine FSH preparations appear to possess only FSH<sup>24</sup>, while horse FSH is 90% FSH<sup>21</sup>. In cattle, follicle-stimulating hormone is used for superovulation. Folltropin®, a porcine pituitary-derived follicle-stimulating hormone, marketed by Bioniche Animal Health USA, is the only FDA-approved FSH for superovulation of cattle in the U.S. Current methods of purification and production of Folltropin® from porcine pituitaries for use in cattle have not been evaluated for differences in glycosylation of FSH. Hypothesizing that hypo-glycosylated FSH co-purifies with luteinizing hormone (LH) as it was shown for human analog, we evaluated porcine LH preparations using FSH beta-subunit Western blotting. Porcine hypo-glycosylated FSH was found in porcine LH-rich fractions. Hypo-glycosylated porcine FSH could be evaluated for efficacy in stimulating superovulation in cattle and other domesticated animals. Superovulation in cattle is important for the production of meat and milk. Improving current methods of cattle superovulation will aid in the production of genetically superior calves.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:32:50 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



*"Differences in Human Gait  
while Carrying a Load at  
Different Positions on the  
Back"*

*By Khoi Lam*

### Abstract

Most people are introduced to backpacks when they are students. As they age, these bags usually grow in terms of size and load. This study sought to determine the differences in human gait patterns when individuals walk with and without a weighted backpack. In addition to backpack weight changes, the experiment placed packs at two different heights on subjects' backs to determine the impact of backpack position on human gait. The hypothesis for the study was that while carrying a weighted backpack, the differences in the gait would be noticeable as weight of load and position of the backpack changed. Data was collected from 10 subjects walking with and without weighted backpacks positioned at two different locations on their backs. Reflective markers were placed on the subjects to track body movement, and a treadmill was used to simulate natural walking. No significant changes were found in the three walking conditions measured: no weighted backpack, 17 %BW in backpack placed high on back, and 17% BW in backpack placed low on back. One significant find was that knee angle had a similar value on carriers of two-sided strapped backpacks while walking and carriers of one-sided strapped backpacks while walking. By understanding the differences in the gait associated with walking with and without the extra weight of a backpack, as well as effects of styles of carrying and positioning on the back, it will be possible to make weight limit recommendations for the population at risk of overexertion, which includes young children, heart attack and stroke survivors, and the elderly.

### [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:33:22 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by [Google Translate](#)



[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us ▾](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



## *"Laser Surface Treatment to Enhance Biointegration of Orthopedic Implants"*

*By Martina Salerno*

### Abstract

Many implanted biomedical devices cause patients to suffer from infections that develop post-surgically on the device surface or in surrounding tissue. These infections not only cause device failure but could also spread systematically. To promote success of an orthopedic implant, quick host tissue integration is required for timely healing. The research explored the role of laser micro-nano machining in creating surface topographies on orthopedic implant surfaces, and evaluated whether or not these topographies would be conducive to simultaneous bone integration and antimicrobial therapeutic delivery. Current orthopedic biomaterials, such as titanium, 316L stainless steel (SS), and cobalt chromium alloys, were modified using laser machining to create varying surface topographies. Host cell adhesion to the materials was evaluated using L-929 fibroblast and MC3T3-E1 osteoblast cells, tissue cells involved in bone growth. This research provides information required to evaluate laser surface treatment against other patterning methods regarding biocompatibility, quick tissue integration, and postoperative infection prevention. This study also contributes to research concerning laser treated surfaces on multiple biometals, which is currently lacking. These additions to the surface modification field could lead to minimization of postoperative infection due to implanted medical devices.

### Table of Contents

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:34:48 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by [Google Translate](#)

[ADMISSIONS](#)[ACADEMICS](#)[RESEARCH](#)[STUDENT LIFE](#)[ABOUT WSU](#)[NEWS / INFO](#)[ATHLETICS](#)[GIVE TO WSU](#)

## MCNAIR SCHOLARS PROGRAM

[McNair Scholars Program  
Home](#)[About Us ▾](#)[Prospective Scholars](#)[Calendar](#)[Forms](#)[McNair Scholars Library  
Guide](#)[Alumni](#)[Annual Closing  
Symposium](#)[McNair Research  
Journals](#)[Newsletters](#)[Program Highlights](#)[Doctorate Recipients](#)[PRE-M Academy](#)

## IN THE NEWS

["The Doctor" Newsletter](#)

McNair Scholars Program  
1845 Fairmount  
Box 199  
Wichita, KS 67260-0199  
316-978-3139  
lawanda.fields  
@wichita.edu



# *"Characterizing Boundary Conditions of Self-Adjoint Operators"*

*By Zachary Pearson*

### Abstract

In cases where the domain of the function under consideration is, itself, a function space, the function is considered an operator. Self-adjointness is an important property of many operators. There are cases where it is possible to coerce an operator into being self-adjoint by carefully choosing its boundary conditions. These choices of boundary conditions, called self-adjoint extensions, are the focus of this study. We seek to characterize these extensions by looking at how these boundary conditions are determined. To achieve this, we had looked at several methods of determining the length of a given curve as well as the area of the surface produced by rotating the curve about the x-axis. During these calculations, we assumed the curve was fixed. We were able to derive generalized formulae for describing the length of an arbitrary curve as well as the surface area of revolution. If we turn this viewpoint around, where the curve is no longer fixed but is, itself, the variable, we are able to apply the results of the aforementioned calculations to a wide range of problems. In many important physical situations, the equations which appear are called self-adjoint. After determining the minimizer for both the length and surface area of revolution, we will define this notion and discuss the relationships among self-adjointness, integration by parts, and the determination of boundary conditions.

### [Table of Contents](#)

This site is maintained by MCNAIR SCHOLARS PROGRAM. This page last modified on Thursday, June 09, 2016 11:35:04 AM Central US Time. If you find errors please bring them to the attention of LaWanda Fields ([lawanda.fields@wichita.edu](mailto:lawanda.fields@wichita.edu)).

Wichita State University | 1845 Fairmount St. Wichita, Kansas 67260 | (316) 978-3456

[A-Z](#) | [Policies and Procedures](#) | [Notice of Nondiscrimination](#) | [Campus Safety](#) | [RSS Feeds](#) | [Contact Wichita State University](#)  
© 1995-2016 Wichita State University. All rights reserved.

Select Language

Powered by [Google Translate](#)