

**The Berry Summer Thesis Institute Students  
would like to thank the following  
for making this program possible:**

**The Berry Family and Berry Family Foundation**

**Summer Thesis Mentors**

*Professor Albino Carrillo, Dr. Trevor Collier, Dr. Anne Crecelius, Dr. Roger Crum,  
Dr. Robert Crutcher, Dr. Marian Diaz, Dr. Matthew Lopper, Dr. Thomas Morgan,  
Dr. Stephen Richards, Dr. Amit Singh and Dr. Thomas Williams*

**Dayton Community Partners in Servant Leadership**

*Catholic Social Services Refugee Resettlement, The Dakota Center,  
The Dayton International Peace Museum, East End Community Services,  
Five Rivers Metroparks Community Gardens, Good Neighbor House,  
House of Bread, Reach Out and United Rehabilitation Services*

**UD Campus Ministry's Center for Social Concern**

*Nick Cardilino*

**Fitz Center**

*Kelly Bohrer and Dick Ferguson*

**UD Career Services**

*Jason Eckert and Elizabeth Seager*

**Roesch Library**

*Heidi Gauder and Amy Gullen*

**UD Student Development: Residence Life**

**UD Administration**

*Office of the Provost*

*Offices of the Deans — College of Arts and Sciences,  
School of Business Administration, School of Engineering  
and School of Education and Health Sciences*

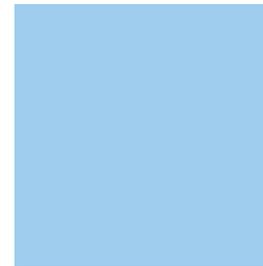
**University Honors Program Review Committee**

**University Honors Program Staff**

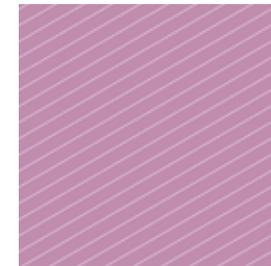


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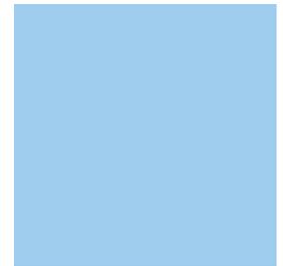
**Berry Summer Thesis Institute Symposium 2014**



arts



business



education

engineering

sciences





## University Honors Program

presents the

# Berry Summer Thesis Institute Symposium 2014

July 31, 2014

1:00 to 5:00 p.m.

Science Center Auditorium SC 114

Reception 5:00 to 6:00 p.m.

Science Center Prefunction Space

*Thanks to a recent gift from the Berry Family Foundation and the Berry family, the UHP again offered eleven rising juniors the opportunity to participate in the Berry Summer Thesis Institute. First initiated in the summer of 2012, the institute introduces students with a proven record of academic success and interest in research to intensive research, scholarship opportunities, academic Honors credits and professional development workshops. Students selected for the program were nominated by faculty mentors and competitively selected for participation by the University Honors Program review committee.*

*Each student pursued a 12-week summer thesis research project under the guidance of a UD faculty mentor. In coordination with the Center for Social Concern, campus ministry and the Fitz Center for Leadership in Community, the students also learned about civic engagement and servant leadership by volunteering with local community partners.*

## Opening Remarks

1:00 p.m.

### Joseph B. Ferber

Major: English

Mentor: Thomas L. Morgan, Ph.D.

Department: English

#### Thesis Title

*Revising the Lyrical I: Postcolonial Poetry and Subject Formation*

#### Description

Traditional Western poetic conventions of the lyric "I" emphasize the importance of the individual by focusing only on the perspective of the narrative voice. Applying post-colonial theory to the poetry of several Pan-American-Indian authors demonstrates how Western prioritization of the individual is complicit with forcing the indigenous to follow Western ways. In this poetry, authors challenge traditional usages of the lyrical "I" by juxtaposing them alongside collective "we" perspectives in order to critique the Individual's inability to breach the limits of its own belief system. Identity created by the relational structure between pronouns helps create a revised poetic perspective able to identify ways that indigenous peoples have challenged Western belief patterns. Specifically, interactions between individual and collective identities help reveal the Western tendency to associate sexual promiscuity with skin color. Close attention to the relationship between the lyrical perspectives of "I" and "we" brings to light a failure of the traditional Western "I" to empathize with difference, as seen explicitly in silent perpetuation of Western views uncritically valuing sexual exoticism.



1:05 p.m.

### Brian D. Bates

Major: Finance and Operations Management

Mentor: Trevor C. Collier, Ph.D.

Department: Economics and Finance

#### Thesis Title

*The Impact of E-Commerce on Big-Box Retailers*

#### Description

The history of retail has been an evolutionary process of new innovations and transformations. It is possible that we are dawning upon a new revolution of the retail environment as electronic commerce (e-commerce) continues to grow. This study will analyze the impact of e-commerce on retail markets, specifically big-box stores (defined as stores between 50,000 and 200,000 square feet) using financial and real estate data. Two separate models will be utilized to answer the following questions. Has the growth of e-commerce affected the retail real estate market? Which retail submarkets have been affected most by the growth of e-commerce? Are big-box retailers with burgeoning e-commerce programs less at risk to the growth of e-commerce than those with none?



1:25 p.m.

## Luke F. Bugada

Major: Chemical Engineering  
Mentor: Matthew Lopper, Ph.D.  
Department: Chemistry

1:45 p.m.



### Thesis Title

*The Use of a Molecular Probe to Investigate Mechanistic Details of PriA Helicase Function*

### Description

DNA replication in bacteria is an essential process through which a cell's genetic information is copied. The replication machinery often encounters DNA damage that can disrupt a cell's ability to completely copy its DNA. For DNA replication to resume following these disruptive events, the replication machinery must be reloaded onto the DNA through a process initiated by the PriA helicase. We seek to better understand how PriA works by using a compound that inhibits the function of PriA. We have determined the specific mode through which the compound inhibits PriA and are in the process of using fluorescent measurements to determine the number of inhibitor molecules that bind to a single PriA molecule. Finally, we seek to pinpoint where the inhibitor compound binds on the surface of PriA. Our findings will contribute to understanding the mechanism through which PriA rescues the replication machinery following disruptive encounters with DNA damage.

## Stephanie M. Loney

Major: English and Spanish  
Mentor: Albino Carrillo, M.F.A.  
Department: English

2:05 p.m.



### Thesis Title

*Modern Maturation: Coming of Age in American Society*

### Description

Although there is a large collection of literature that dialogues with the themes of the American Dream and the coming-of-age story, this short story cycle explores how those themes interact with each other within the context of modern day America. It accomplishes this through a series of linked stories that follow Abigail Holden as she faces the struggles many college students today must overcome to ultimately achieve maturation and their own understanding of the American Dream.

## Sarah A. Stalder

Major: Biology  
Mentor: Amit Singh, Ph.D.  
Department: Biology

2:25 p.m.



### Thesis Title

*Investigation of the Role of Defective Proventriculous (dve), a New Axial Patterning Gene in Retinal Development*

### Description

A complete understanding of the genetic basis of the fundamental process of eye development has not yet been fully understood. Recently the homeotic gene defective proventriculous (dve), which has previously been shown to be involved in midgut specification in *Drosophila*, has been found to be one of the key dorsal eye fate determination genes. Our preliminary data suggests that dve interacts with the highly conserved Retinal Determination (RD) genes to control eye field specification and differentiation. The aim of this

project is to place dve in hierarchy of RD genes, and to test if dve can promote or block the eye formation function of the RD genes. We used conventional genetic approaches of tissue/domain specific gain-of-function and loss-of-function to test the interaction of dve with each of the RD genes individually to discern their interactions in eye development. Here we will present the findings of this study to date.

## Break

2:45 p.m.

## Genevieve M. Kocoloski

Major: Exercise Physiology  
Mentor: Anne Crecelius, Ph.D.  
Department: Health and Sport Science

3:00 p.m.



### Thesis Title

*The Effect of Dietary Nitrate Supplements on Oxygen Consumption During and After Exercise*

### Description

A rich source of dietary nitrates ( $\text{NO}_3^-$ ), is beet root juice (BR) and ingestion prior to exercise can lower the rate of oxygen consumption ( $\text{VO}_2$ ), increasing muscle efficiency and improving performance. However, the effect of nitrate supplements on  $\text{VO}_2$  after exercise, or excess post-exercise oxygen consumption (EPOC) is unknown. We hypothesized BR ingestion decreases EPOC following prolonged submaximal exercise. Seven young, healthy males (21-31 years old) performed maximal and submaximal exercise in acute nitrate supplementation (70ml concentrated BR) and control conditions.  $\text{VO}_2$ , heart rate and blood pressure were determined for 45 minutes pre-exercise, during exercise, and for 60 minutes post-exercise. Preliminary data demonstrate nitrate supplementation does not impact  $\text{VO}_2$  at rest but attenuates  $\text{VO}_2$  ~10% during and post-exercise. While increased efficiency during exercise is beneficial from a performance standpoint, those interested in weight loss may minimize their total energy expenditure with BR. Therefore, recommendations regarding nitrate supplementation should be dependent on individual's goals.

## Morgan E. Pair

Major: Psychology  
Mentor: Robert Crutcher, Ph.D.  
Department: Psychology

3:20 p.m.



### Thesis Title

*The Effectiveness of Transitive versus Intransitive Verbs in Interactive Visual Imagery Created by the Keyword Method*

### Description

Interactive visual imagery has proven to be an effective method for learning. In particular, interactive visual imagery is used to learn concrete word pairs, such as when learning a foreign language. Another proven mnemonic method is the keyword method. In the keyword method a word based on the foreign word is used to relate the pairing. This experiment will investigate why interactive visual imagery is so effective by using the scenes created by the keyword method to learn Indonesian-English word pairs. One possible reason tested in this experiment is the transitivity of the verb used to describe the interaction. A transitive verb is where there is a transfer of action from one subject to another, and an intransitive verb is where there is no transfer of action. Participants will be presented with two scenes for each word pairing with one scene showing the subjects interacting transitively, and the other intransitively.

## Claire C. Konys

Major: Biology

Mentor: Thomas Williams, Ph.D.

Department: Biology

### Thesis Title

*The Role of Polycomb and Trithorax Group Genes in the Development and Evolution of an Animal Trait*

### Description

Differences in gene expression are a prominent cause for variation in form and behavior among organisms. In eukaryotes, gene expression is regulated through the compaction of DNA sequence into chromatin. Gene expression is by default “OFF” due to a repressive compact chromatin state. Expression can be switched “ON” through the modification of histone proteins and by histone repositioning. In the fruit fly species *Drosophila melanogaster*, the Polycomb Group of genes can induce the formation of repressive chromatin and the Trithorax Group of genes can induce permissive chromatin. How these Polycomb and Trithorax genes collectively regulate the development of a trait and their contribution to the evolution of a trait remains poorly understood. My thesis focuses on answering which genes shape a *Drosophila melanogaster* pigmentation trait, when they are needed during this trait’s formation, and whether the uses of these genes have evolved to shape evolutionary changes in pigmentation.

3:40 p.m.



## Maxwell J. Roeske

Major: Biology and Psychology

Mentor: Thomas M. Williams, Ph.D.

Department: Biology

### Thesis Title

*Tracing the Role of bab Gene Duplication and Divergence Events in the Evolution of a Fruit Fly Pigmentation Trait*

### Description

Mutation events can duplicate a gene, creating a pair of paralogous genes. Such increases in number are thought to open additional paths of evolution. This includes coding evolution, in which exons code for proteins, regulatory evolution, in which a gene is expressed by *cis*-regulatory elements, most often located in introns, or rather a blended path of both coding and regulatory evolution. *Drosophila melanogaster* possesses paralogous *bab1* and *bab2* genes that resulted from an ancestral duplication and control abdominal pigmentation. My thesis will use these genes as a model to investigate whether and when *bab* coding sequence evolution contributed to this trait’s origin that might complement the known *cis*-regulatory evolution. This involves testing whether the protein coding sequences of these *bab* paralogs are functionally equivalent through loss-of-function and gain-of-function methods. Collectively, this work will demonstrate how the historical changes to an animal gene made possible the origin of a novel trait.

4:00 p.m.



## Krista E. Bondi

Major: American Studies and History of Art

Mentor: Roger Crum, Ph.D.

Department: Visual Arts

Mentor: Marian K. Diaz, D.Min.

Department: Religious Studies, Loyola University

### Thesis Title

*The Interfaith Campus: The University of Dayton and the Question of Diverse Sacred Spaces in Catholic Higher Education*

### Description

In today’s globalized society, Catholic universities like the University of Dayton must consider the well-being of their diverse student communities. Recently, the University of Dayton — like other Catholic universities—has seen a growth in international students and, consequently, students of different faiths. As a result, the University is experiencing the reality of — or need for — interfaith dialogue, even as the evidence of the renovation of the Immaculate Conception Chapel underscores the continued need to emphasize UD’s traditional Catholic identity and mission. This research examines the availability, or lack thereof, of sacred spaces for students of all faiths at Dayton. Looking at existing spaces at sample Catholic universities, this research explores the potential for interfaith dialogue at the University of Dayton with its intended as well as possible creation or renovation of multi-faith spaces.

4:20 p.m.



## Riley C. Weber

Major: Intervention Specialist Education

Mentor: Stephen Richards, Ed.D.

Department: Teacher Education

### Thesis Title

*Identification of English Language Learners as Gifted Students*

### Description

United States school systems have a growing population of students from immigrant families who require new programs and policies to ensure their academic needs are met. Typically, these students speak a native language other than English and, therefore, must learn English as a second language while simultaneously working to learn the same material as their peers. These English Language Learners (ELL) may not receive an appropriate education due to their language differences, cultural biases found in assessments, and the identification process for exceptional students. Gifted and talented programs in public schools have served an essential purpose for educating and preparing exceptional students for success, but a significantly small number of ELL are represented in these programs nationally. This Honors thesis explores the issues with and the effectiveness of current assessment strategies, and procedures and instruments used in the identification and instruction of ELL in gifted and talented programs.

4:40 p.m.

