



UNIVERSITY *of* ST. THOMAS

UNDERGRADUATE RESEARCH AND COLLABORATIVE
SCHOLARSHIP (URCS) PROGRAM:
COLLABORATIVE INQUIRY

**Inquiry at UST:
A Poster Session with the Results of
Faculty/Student Collaboration
at the University of St. Thomas**

Abstracts

Vol. 23
May 13, 2014

Introduction

The abstracts published here summarize some of the most compelling research and creative inquiry carried out in recent months across many disciplines by undergraduate students at the University of St. Thomas. In all cases, the student researchers have worked in close collaboration with faculty mentors who have contributed their time and talent to help our students dig more deeply into topics of the students' choosing and design.

Funded by the University of St. Thomas through undergraduate research programs administered by the Grants and Research Office, this poster session allows some of our most dedicated scholars an opportunity to share their work with larger audiences and receive the critical scrutiny of their peers, professors, and the general public.

We hope that you enjoy this event and invite you to engage our scholars in ways that will both challenge them and encourage them to continue their journey of the mind.



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May 2014

As president of the University of St. Thomas, I am both pleased and proud to introduce the twenty-third annual poster session devoted to the collaborative projects of our students and faculty, sponsored by the Grants and Research Office.

One of the most effective ways for students to learn is through collaborative inquiry, in which students and faculty work together on research that can have real-world consequences. Active learning of this kind solidly demonstrates our mission as a Catholic university grounded in the liberal arts tradition. We strive to provide a high degree of personal attention in a challenging campus environment that is engaged with the complexities of our urban community and the world beyond.

Collaborative inquiry offers our students the opportunity to experience firsthand their professors' approaches to research questions in a variety of disciplines. It also gives our faculty an excellent opportunity to understand how students think, helping them to develop new ways of examining research problems. Collaborative inquiry enables our students and faculty to experience their disciplines in action, deepening students' academic experience while simultaneously increasing career competency.

I heartily endorse this effort, and I hope you enjoy this presentation so aptly demonstrating the importance of collaborative inquiry at St. Thomas.

Sincerely,

A handwritten signature in black ink that reads "Julie H. Sullivan".

Julie H. Sullivan, Ph.D.
President

Alexander S. Tsadwa

STEREOTYPES AND ATTITUDES TOWARD BLACK-WHITE INTIMATE RELATIONSHIPS

Faculty Mentor: Dr. Buffy Smith

As long as people of African descent have lived in America, BlackWhite intimate relationships have existed in the country. Throughout American history, these relationships have been stigmatized by law and socially discouraged. This study aimed to identify and understand the stereotypes of and attitudes toward BlackWhite intimate relationships among undergraduate students from colleges and universities in the Twin Cities metro area. The data was qualitative, collected through the use of a brief demographic survey and a twentytwo question interview instrument. The findings suggest that patriarchy is present in the gender patterns of BlackWhite intimate relationships, racially homophilous relationships are still the norm and people are still hesitant to fully accept Black-White intimate relationships.

Miguel Velez

EXTENDING SMILES TO ENCODE REACTION MECHANISMS

Faculty Mentors: Dr. Peter Gittins and Dr. Jason Sawin

Cheminformatics combines chemistry and computer science to represent and manipulate molecules in a digital environment. A standard way of representing molecules in a computer readable format is the Simplified Molecular Input Line Entry System (SMILES), a line notation that represents molecules using alpha-numeric characters. SMILES strings can be manipulated using software development kits such the Chemistry Development Kit (CDK), an open source Java library specific to computer science. These tools enable the comparison of molecules before and after a chemical reaction. However, they do not illustrate the underlying reaction mechanism, which is valuable information in understanding how a reaction takes place. We have created the Simple Mechanism Of Reaction Encoding System (SMORES), an extension of SMILES, which encodes reaction mechanism information.

Our SMORES extension consists of a SMILES string followed by an alphanumeric description of a reaction mechanism. We also extended the CDK in a Java program, to allow processing of SMORES inputs. The program allows a user to enter a SMORES string, which creates a model of the starting molecule. Then the program manipulates this molecule based on the specified mechanism. Finally, a model of the molecule produced by this mechanism is generated. This structure can be used to generate a SMILES string or a graphical representation.

Daniel B. Volovets

EFFECTS OF ACUTE ESTRADIOL ADMINISTRATION ON VOCAL COMMUNICATION IN MALE ZEBRA FINCHES WITH VARIABLE LEVELS OF TESTOSTERONE

Faculty Mentor: Dr. Sarah A. Heimovics

Across vertebrate species, 17 β -estradiol (E_2) has been shown to rapidly (within 30 minutes) modulate consummatory social behaviors, such as direct aggression and copulation. However, to date, what remains unclear is whether E_2 can also influence the expression of appetitive social behavior. The present study was designed to examine the effects of acute E_2 administration on appetitive sexual behavior (courtship singing) in male zebra finches. A 500 $\mu\text{g/kg}$ dose of E_2 was administered via subcutaneous injection to male birds with either high or low levels of testosterone (T). Levels of T were modulated using a literature-affirmed water restriction paradigm. Directed (courtship) and undirected song expression in response to the introduction of a female conspecific was subsequently analyzed. It was hypothesized that

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