

March 21 – March 22, 2014

**Austin
College
Student
Scholarship
Conference**



AUSTIN
COLLEGE



Welcome

Welcome to the 2nd annual Austin College Student Scholarship Conference. The presentations describe original research undertaken by Austin College students. We are delighted to gather in celebration of the intellectual curiosity of our students and their participation in the broader pursuit of new knowledge.

Opportunities for “hands-on” learning is a hallmark of an Austin College education. It is significant that this conference includes many different disciplines and methods of study. We hope that each student will have the deep pleasure of moving their academic work beyond the classroom and into the laboratory, studio, or study.

Research and scholarship require the spark of an original idea, but they also require the dedication, patience, and commitment to see that idea through to completion. Presenting the results of research requires its own skills of strong oral, written, and visual communication. All of these efforts serve our students well in whatever future craft or career they decide to pursue.

In every instance, the student researchers have been guided and mentored by Austin College faculty, who construct their own intellectual pursuits to engage undergraduates and provide ample jumping off points from which students can embark on independent projects. I am grateful to the many faculty sponsors who have supported these young scholars and scientists. And I am especially grateful to the conference planning committee who has given energy and time to providing this showcase for student achievement.

The conference is designed to encourage dialogue and engagement. We hope you will take this opportunity to meet new people, encounter new ideas, and think about the ways your own education can be expanded through the pursuit of original research.

Marjorie Hass
President

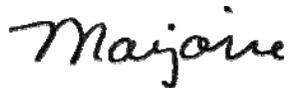
A handwritten signature in black ink that reads "Marjorie". The script is cursive and fluid, with a prominent loop at the end of the word.

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Schedule of Events

Friday

2:00 p.m.

Conference Registration table opens

Wright Campus Center Lobby

3:00-5:00 p.m.

Poster Symposium

Mabee Hall – WCC

5:00 p.m.

Welcome Remarks from Dr. Hass

Mabee Hall Stage – WCC

5:15-6:15 p.m.

Reception for participants and visitors

Mabee Hall – WCC

7:30 p.m.

Locuras Quijotescas / Quixotic Madness

Beardsley Arena Theatre – Ida Green

8:30 p.m.

Improv Troupe Performance

Beardsley Arena Theatre – Ida Green

Schedule of Events

Saturday

8:30 a.m.

Conference Registration Table Opens

WCC Lobby

8:30-9:00 a.m.

Coffee Reception

IG Lobby & WCC 2nd Floor

9:00-10:15 a.m.

Block I Student Presentations

WCC and IG Classrooms

10:15 a.m.-11:30 a.m.

Block II Student Presentations

WCC and IG Classrooms

11:30 a.m.-1:30 p.m.

Lunch Panel

WCC 231

1:45-3:00

Block III Student Presentations

WCC and IG Classrooms

3:00-4:00 p.m.

Chamber Music for Voices and Instruments

Recital Hall – Craig Hall

4:00 p.m.

Locuras Quijotescas / Quixotic Madness

Beardsley Arena Theatre

Student Contributors

Ashley Abraham	Robert Dunlap
Dale Abraham	Cody Edwards
Katherine Alishire	Maddisson Elizardo
Amy Anderson	Elsih Escoto
Jesse Baker	Amber Eustace
Joel Barrett	Maddy Fouga
Jordan Baugher	Sam Gamble
Lindsay Bechtel	Carla Garcia
Morgan Beeman	Courtney Goldstein
Daniel Blackwell	Luci Gonzales
Lauren Bolinger	Daniel Graham
Anne Booker	Taylor Grenwalt
Thomas Boyanton	Kate Alice Hamilton
Kalli Burdick	Savannah Hardin
Celeste Burnett	Katherine Harkey
Zhiwei Cai	Amy Harvey
Morgan Carmody	Aryn Hays
Ellie Cary	Marimar Henandez-Jaimes
Caitlin Caswell	Kenny Herbert
Ali Center	Connie Herrera
Calvin Chang	Skyler Highsmith
Devin Chang	Mikayla Hill-Elliott
Albert Chung	Lauren Hurley
Gabriel Clarke	Nick Inman
Brian Clinton	Krista Jarrell
Ashlyn Conrad	Rachel Jimenez
Reed Cook	Jaclyn Jones
Roxanne Crouch	Jordan Jones
Megan Daugherty	Travis Kannarr
Sarah Davis	Annalise Kean
Kellie Day	Michelle Keller
Abdelaziz De Vol	Jazmin Kelly
Ilish DeWitt	Sathya Kikkeri
Xuanru Ding	Taliesin Kinser
Diana Dinh	Stephanie Kutler
Jonathan Dittman	Alexis Larmeu
John Donor	Jeremy Lauren-Steinbrenner

Student Contributors

Jeesoo Lee	Edgar Rodriguez
Tyler Liang	Reid Rose
Lizzy Lincoln	Whitney Russell
Kramer Lindstrom	Risa Rylander
Noelle Low	Lauren Saxon
Mason Makarwich	Stephanie Schultz
Ashley Malcolm	Eric Schuppe
Nicholas Maldonado	Akshaya Selvamani
Deepika Mannem	Karisma Sheth
Gaby Margocs	Conner Skinner
Madeline Mannix	Anna Sliz
Gaby Margocs	Samuel Spillyards
Sarah Martin	Kayla Stamas
Rose Massey	Chris Tanner
Madison Matthews	Sasha Tatum
Catherine McKenas	Kristofer Taylor
Alexandra McLendon	Brent Thomas
Jordan Meredith	Connie Tran
Madison Messinger	Pido Tran
Kusha Mohammadi	Colton Turbeville
Alex Morano	Caleb Walters
Nancy Musoke	Kathryn Wattenbarger
Saman Najmi	Robert Wells
Katie Nicholas	Blair Whalen
Maeve Nichols	Shardae White
Spencer Nystrom	Greg Whiteside
Alex Opper	Easton Willis
Nathan Packard	Priscilla Wolfe
Daniel Park	Lindsey Womack
Kyle Parker	Robyn Wright
Amberlee Partridge	Evann Wu
Shivani Patel	Mengfei Yu
Anika Payne	Yamna Zaman
Annie Porter	
Jonathan Quiring	
Keaton Raney	
Christine Ritchie	

Committee

Coordinator

Lance Barton

Political Science

Nathan Bigelow

Computer Science and Mathematics

Aaron Block

Psychology

Renee Countryman

English

Carol Daeley

Music

Ricky Duhaime

Theatre

Kirk Everist

Art

Mark Monroe

Chemistry

John Richardson

Student Intern

Kyle Potaniec

Chamber Music for Voices and Instruments

**Saturday, March 22, 3:00 p.m.
Recital Hall – Craig Hall**

**Reception immediately following the
performance in Craig Hall Gallery**

Musical collaborations by Austin College students
and faculty; the program will consist of vocal and instrumental
works in a variety of styles drawn from the
Classical through Modern periods

**Performed by Austin College
Students and Faculty**

Student Performers:

Annalise Kean
Megan Daugherty
Lauren Hurley
Katie Nicholas
Shardae White
Kellie Day
Deepika Mannem
Thomas Boyanton
Jesse Baker
Travis Kannarr

Faculty Performers:

John McGinn
Justin Duncan
Ricky Duhaime

Austin College Student Art Exhibition

A Statement About The Exhibition:

This exhibition is a collection of artworks curated to showcase the variety of research methods and outcomes in the visual arts at Austin College. As such, it represents a cross section of work underway in the Austin College art labs. Individual students were identified as outstanding representatives of the department, each working in unique disciplines in the studios at AC. These students were invited to submit work to this exhibition. The criteria for inclusion were left open; some focused on preparing cohesive installations while others created individual pieces for display. The artworks assembled here each represent a different approach among the divergent disciplines in our program. The range is broad; from a year-long project by an individual artist, to studio projects based on class assignments, to an installation project from an entire class. Each of these approaches reflects one of the many avenues of student research opportunities in the arts and together they do a good job of representing the diversity of student research in our department.

Techniques and methods also vary from simple exploration of materials, such as Sarah Martin's tactile approach to painting, to works meant to create visual documents that reference and respond to traditional art making techniques, such as Elsih Escoto's large format drawings. The work of Lauren Bolinger reflects some current history of the institution by using found material scavenged from the vacated Moody Science labs to create a piece that speaks to transformation and change. Possible outcomes in the artmaking process are diverse, with some work meant to initiate conversations that push boundaries and question traditions and others attempting to distil our collective experiences to the pure visual. Diana Dinh insists that her work is simply about design. Sam Gamble's individual research project includes work that was started as a Scarborough Summer Fellowship and has culminated in a series of images that combine traditional academic research methods with challenging visual narratives.

Another artwork included in the exhibition is the result of a group project that was designed to expand each student's idea of what is possible to create with clay. Beginning students sometimes have a myopic approach to making art and this project necessitated that they work together toward a collective objective. This teamwork resulted in an elevation of each artist's creative vision. The Austin College "tablescape" was shown in the Sherman community as part of a charity event sponsored by *The Women's Gift Exchange*. In this ACSC forum the project lives on as an example of collaborative learning.

In all, sixteen students have been included in this 2014 exhibition of the Austin College Student Scholarship Conference. The pieces represented here range from work done as part of class assignments to individual research, realized in the student's studio. The Austin College Department of Art and Art History is proud to present a few of the many faces of the visual arts in our community.

Individual Artists

Diana Dinh
Sam Gamble
Sarah Martin
Lauren Bolinger
Elsih Escoto

Group Project Participants

Jordan Baugher
Celeste Burnett
Abdelaziz De Vol
Kate Alice Hamilton
Amy Harvey
Krista Jarrell
Jordan Jones
Alexis Larmeu
Samuel Spillyards
Colton Turbeville
Mengfei Yu

Austin College Improv Troupe

Friday, March 21 at 8:30 p.m.
Beardsley Arena Theatre - Ida Green

The Austin College Improv Troupe was started by Dr. Kirk Everist and a group of students as a workshop. Today, the troupe is a group of sixteen students with majors and minors in the sciences, social sciences, and humanities. AC's liberal arts curriculum means we bring something different to our style of play. Some scenes incorporate foreign language, while others integrate our areas of study. We call this fusion of Chicago Style Improvisation and AC sensibilities, Sherman Style Improv. We do things a little differently here. Some troupes have uniforms, we have ties! Enjoy the show.

We are the Austin College Improv Troupe and we are:

Katherine Ailshire
Calvin Chang
Reed Cook
Sarah Davis
Cody Nash Edwards
Maddy Fouga
Jaclyn Jones
Sathya Kikkeri
Lizzy Lincoln
Noelle Low
Julio Malave-Torres
Spencer Nystrom
Conner Skinner
Sarah Wilhelm
Lindsey Womack

LOCURAS QUIJOTESCAS (QUIXOTIC MADNESS)

March 21 at 7:30 p.m.
March 22 at 4:00 p.m.
Beardsley Arena Theatre - Ida Green
Directed by Lourdes Bueno



DULCINEA...¿SOY YO?/DULCINEA...IS IT ME?

by Lourdes Bueno

Read by:

Carla Garcia

Sandra Carrasco-Bueno

NOCHEBUENA EN TENOCHTITLAN/

CHRISTMAS EVE IN TENOCHTITLAN

by Juan Pablo Heras González

Read by:

Edgar Rodriguez

Keaton Raney

YO SOY DON QUIJOTE DE LA MANCHA/

AM DON QUIXOTE FROM LA MANCHA

by José Ramón Fernández

Read by:

Morgan Carmody

Carla Garcia

Edgar Rodriguez

Molecular Mechanisms Conferring HIF-2 α Dependent Activation of Erythropoietin Gene Expression

Spencer Nystrom¹, Jason Nagati², Elhadji Dioum²,
and Joseph A. Garcia²

¹Biology Department, Austin College
University of Texas Southwestern Medical Center at Dallas
Abstract #1

Hypoxia inducible factor (HIF) transcription factors alter expression of select target genes as adaptive cellular and organismal response to hypoxia and other environmental stressors. The founding member of the HIF family, HIF-1 α , was identified by virtue of its ability to bind to the hypoxia responsive element (HRE) located in the erythropoietin (epo) enhancer region. The subsequent identification of the highly related HIF-2 α raised the question of the relative role for each HIF alpha member in the in vivo regulation of epo gene expression. Several published studies indicate epo is regulated in vivo by HIF-2 α , both in the kidney as well as in other sites of expression. These findings are supported by in vitro studies that demonstrate endogenous HIF-2 α is the principal regulator of epo gene expression in Hep3B cells. However, the molecular mechanisms responsible for HIF-2 α selective regulation of epo gene expression remain largely unknown. We identified an evolutionarily conserved DNA sequence in the HRE (arbitrarily termed BS2) that was critical for HIF-2 α mediated epo activation. Through sequence comparison, we identified the Egr family of transcription factors as putative co-activators of epo expression. We determined that the transcription factors Egr1 and Egr2 both bind BS2 under hypoxia, which confers HIF-2 α selective activation of both the epo reporter and endogenous epo in Hep3B cells, providing a novel mechanism for the regulation of epo expression under chronic hypoxia.

Site Directed Mutagenesis of Tryptophan 60 in Beta2-microglobulin

Madison Mathews, Caleb Walters, and John Richardson
Chemistry Department, Austin College
Abstract #2

Beta2-microglobulin (β_2 -m) is a small 99 residue protein that is a part of the type I major histocompatibility complex (MHC-I) on all nucleated cells. It is shed from the surface of cells into the bloodstream as cells undergo apoptosis and is excreted from the body in people with normal functioning kidneys. However, patients with kidney disease do not excrete the protein from the body; this causes a build up of the free circulating β_2 -m over time and eventually results in amyloid fibril deposits. These amyloid fibrils are typically deposited in the musculo-skeletal system, leading to the onset of dialysis related amyloidosis (DRA), which is then complicated by long term hemodialysis. The goal of our lab is to utilize this phenomenon to study the protein misfolding process. Prior research in the Richardson lab replaced the amino acid tryptophan W60 with phenylalanine to remove the fluorescent signal that was competing with W95, the residue that reports on the structure of the protein. The characterization of the W60F mutant determined that it was significantly more stable than the wild type protein, an unexpected result. Our project is to introduce other mutations at position 60 to determine the nature of the interactions at this site. We are utilizing PCR and site directed mutagenesis for our project to create four different mutants W60A, W60S, W60M, and W60Y. We then look at the sequencing to determine if we have made a successful mutation, which will then be expressed, purified and characterized. We hope to use this data to determine the folding landscape of the wild type protein, which could then be used to investigate treatments for DRA and other aggregated fibril diseases.

Adams Observatory's First Images of Jupiter and the Moon: Image Capture and Processing for Bright Sky Objects

Aryn Hays, Greg Whiteside, David Baker, and Peter Hyland
Physics Department, Austin College
Abstract #3

The purpose of this work is to acquire and process high-resolution planetary images using Austin College's new state-of-the-art 24-inch telescope in the Adams Observatory. The observatory is a new addition to the Physics Department and the Austin College community, and our primary goal was to develop best practices and procedures for planetary imaging with the new facility. Our primary targets were Jupiter and the Moon, which require different types of image processing. We experimented with various CCD and CMOS cameras, image capture software, and post-processing applications. Several techniques were used to improve image quality, including video capture, image stacking, derotation, color combining, and image mosaics. The best results were achieved with the ZWO ASI120MM camera using red, blue, green, and luminance filters; Registax software for image stacking; WinJuPos software for derotation; and Maxim DL for color combining. We developed a user's guide that walks a new user through the steps to produce a high-quality planetary image.

The Effects of Facial Piercings on Attractiveness and Trustworthiness

Annalise Kean, Devin Chang, and Peter Marks
Psychology Department, Austin College
Abstract #4

Facial piercings can play a role in determining not only someone's physical attractiveness to others, but also their ability to find a job or achieve success in personal and professional contexts (see Martino & Lester, 2011; Swami et al., 2011). This study examined the effect of the presence of facial piercings on an individual's task attractiveness (i.e., the target's perceived academic and professional competence), physical attractiveness, and perceived trustworthiness. We hypothesized that participants would rate both males and females with facial piercings significantly more negatively than males and females without facial piercings on all three variables.

55 undergraduate participants were presented with one of four photos, each consisting of a man or woman with or without facial piercings. Each participant completed a 15-question survey to indicate their opinion of the pictured individual. To test our primary hypothesis, we conducted a 2x2x2 factorial ANOVA (rater sex * target sex * piercing status) for each of the three dependent variables (trust, physical attractiveness, and task attractiveness). The results did not support the prediction that average participant ratings of physical attractiveness would be significantly lower for targets with facial piercings than for targets without facial piercings.

Thrombin-Induced Contractility of Corneal Fibroblasts Mediates Cell Clustering Through Transient Remodeling of Collagen Matrix

Jonathan Quiring¹, Matthew Petroll², Miguel Miron-Mendoza,²
& Eric Graham²

¹Chemistry Department, Austin College

²University of Texas Southwestern Medical Center at Dallas

Abstract #5

The cornea is an optically clear tissue that forms the front surface of the eye, and accounts for nearly two-thirds of its refractive power. During wound healing, quiescent corneal keratocytes differentiate into fibroblast phenotypes that mediate cell migration, wound contraction and extracellular matrix (ECM) remodeling. Recently there has been increased interest in understanding matrix mechanics and the role it plays in determining cell behavior. In particular, the ECM environment has been found to promote the phenomenon of cell clustering in procontractile conditions. The goal of this study was to employ fluorescent, confocal and time-lapse imaging techniques in order to investigate thrombin induced mechanical interactions between corneal fibroblasts and the ECM as they pertain to collagen remodeling and wound healing. Quantitative analysis of nearest neighbor distances and group sizes of corneal fibroblasts indicate thrombin induces a contractile phenotype in both 2-D and 3-D collagen ECM models. Subsequent clustering, resulting from thrombin-induced contraction of corneal fibroblasts, appeared to be directly related to the cellular reorganization of the collagen ECM, denoted by the combined presence of both actin and collagen stress fibrils.

The Role of Gender and Relationship Status in Specific Sexual Practices

Ashley Malcom, Diana Dinh, Nathan Packard, and Lisa
Brown
Psychology Department, Austin College
Abstract #6

The aim of this project was to assess the effects of gender and relationship status on a person's specific sexual preferences. It was hypothesized that women will be more likely to focus on their partner's pleasure, but men will be more likely to focus on their own pleasure. It was also hypothesized that people in a monogamous relationship relative to those who are not will focus more on a partner's pleasure. The study used a 2x2 between subjects design in which participants filled out a survey listing several sexual practices. For each item, participants rated the extent to which the specific act helped 1) to turn them on and 2) to reach orgasm. Results showed that both gender and relationship status affected whether a person preferred to focus on his/her partner's pleasure, but gender seemed to be the more important factor in whether a person focused on his/her own pleasure.

Using Infrared Spectroscopy to Examine the Effect of Branch and Linker Lengths on the Properties of Trialkylsilyl Bisurea Organogelators

Kathryn Wattenbarger and Karla McCain
Chemistry Department, Austin College
Abstract #7

Thermoreversible organogelation has been the focus of many studies due to their possible use in oil spill recovery and drug delivery. Though many compounds have been shown to be organogelators, very few contain silicon. A structure function relationship study was conducted using silicon as a branching point to increase the number of alkyl tails in the organogelator. The highly branched bisurea compounds were synthesized by reacting silyl chlorides with amino alcohols followed by reaction with bisisocyanates to create potential gelators. Infrared spectroscopy has shown both hydrogen bonding between the ureas and entanglement of the alkyl tails exists.

Effects of Environmental Cues on Perception of Healthiness and Portion Size

Shivani Patel, Yamna Zaman, and Ian MacFarlane
Psychology Department, Austin College
Abstract #8

From fast food to meals made at home, more and more people are aiming to eat healthy. In the process of doing so, individuals must deem food items as healthy or unhealthy. What about portion size? Portion sizes can help differentiate between if the food item is healthy or unhealthy depending on how much is eaten. This research investigated how college students distinguished the difference between a snack and a meal, and foods on a scale from unhealthy to healthy. A sample of 19 Austin College students was selected via email through the Austin College Psychology Research Pool listserv or by word of mouth. Students were exposed to one of three distracter groups, a video about healthy eating and exercise, a short survey reflecting on their previous meal, or an academic task. All the groups took a survey in which they labeled 20 food items on a scale of healthy to unhealthy and if it was considered as a snack or meal. A one-way between subjects ANOVA was conducted to compare the effect of video, passage, and short answer on the perception of healthiness of foods. A chi-square test was performed to see the relationship between task and portion size, snack or meal. It was concluded that there was no significant effect of task for rating of healthiness of food [$F(2,16) = 0.878, p = 0.435$]. There was only a relationship found for crepes between portion sizes and task [$\chi^2(2, N = 19) = 8.94, p = 0.01$]. In the passage group more individuals deemed crepes as a snack while those who participated in the short answer or watched the video deemed crepes more as a meal. Environmental conditions may have made individuals more inclined to choose a specific portion size. This study helps illustrate the perception of healthiness and portion sizes of foods to Austin College students.

Regulation of p53 Stability Through the PA28 γ Facilitated Degradation of TAF9

Nick Inman and Lance Barton
Biology Department, Austin College
Abstract #9

The 28-kD γ proteasome activator gamma isoform (PA28 γ) has been found to be involved in cell fate decisions through the proteasome facilitated degradation of p53. Previous investigations have shown that PA28 γ enhances MDM2 facilitated polyubiquitination of p53, marking p53 for proteasomal degradation. The TBP-associated factor 9 (TAF9) has been reported to stabilize p53 by acting as a competitive inhibitor of MDM2 and therefore preventing p53 polyubiquitination. Because of the opposite roles of MDM2 and TAF9, yet shared p53 binding domain, PA28 γ might be inhibiting TAF9 functions in addition to enhancing MDM2 function, which would result in PA28 γ having multiple paths to control p53 stability. This study attempts to further explain PA28 γ 's role in p53 degradation by investigating whether PA28 γ facilitates the degradation of TAF9 by examining the cellular protein levels of TAF9 in PA28 γ deficient murine embryonic fibroblast (MEF) cells. This study reports that TAF9 levels may be dependent on PA28 γ under certain conditions suggesting the possibility that PA28 γ has a greater role in the control of apoptosis through the p53 gene.

Exchanging Labile Pyrazine with Bispyridyl Ligands to Form Diimine Platinum(II) Dithiolene Complexes

Nicholas Maldonado and Bradley Smucker
Chemistry Department, Austin College
Abstract #10

The pyrazine in $(pz)_2Pt(mnt)$ (pz = pyrazine, mnt = maleonitriledithiolate) was exchanged with bispyridyl ligands (1,2-Bis(4-pyridyl)ethane, bpa , 1,2-Bis(4-pyridyl)ethylene, bpe , 1,2-Bis(4pyridyl)propane, bpp , and 1,2-Bis(4-pyridylamido)benzene $bpab$) to form supramolecular building blocks. The ratio of ligand to Pt (mnt) determined the manner of coordination (monotopic or bridging) of the bispyridyl ligands. All compounds exhibited strong absorption into the visible region.

Examination of the Physiological State of Prehibernatory Golden Mantled Ground Squirrels

Kalli Burdick, Rose Massey, Annie Porter, and Jessica Healy
Biology Department, Austin College
Abstract #11

Mammalian hibernators are characterized by the ability to undergo a torpor state, in which they exhibit significantly reduced metabolic, cardiac, and respiratory rates, as well as a reduction in body temperature to near ambient temperature. The torpor state is accompanied by a decrease or, in the case of Golden Mantled Ground Squirrels (GMGS), a complete cessation in food intake. Successful hibernation requires significant storage of body fat during the prehibernatory period that results in seasonal obesity. The extreme variation in body composition demonstrated by these hibernators throughout their circannual cycle makes them ideal for studying food regulation and obesity in mammals. Previous studies suggest that the orexigenic hormone ghrelin and the anorexigenic hormone leptin play a role in the seasonal regulation of food intake and body fat accumulation in these animals. This study examines the body composition and food intake, as well as the circulating concentrations of ghrelin, free fatty acids (FFAs), and leptin in captive GMGS fed either a standard rodent chow or supplemented high fat diet during the pre-hibernation season (September-October 2013). Results did not illustrate statistical significance between the two dietary groupings in body mass, FFAs, leptin, or body composition. However, the results did suggest that ghrelin levels increased significantly ($p=0.028$) during the four weeks of the experiment, while the food intake remained the same. This unexpected result may indicate a changing sensitivity to ghrelin as animals begin to decrease food intake in preparation for the winter hibernation season.

Stochastic Analysis of Multiprocessor Real-Time Systems

Kramer Lindstrom and Aaron Block
Computer Science Department, Austin College
Abstract #12

This project will implement Professor Block's model of a feedback control network and use probabilistic analysis to model the running time of tasks at different service levels. It will involve running tasks at various service levels and using the results of those tests to generate probabilistic distributions of the tasks' run times.

Testosterone and Cortisol Reactivity in Fathers Following an Acute Stressor

Roxanne Crouch, Eric Schuppe, Ashlyn Conrad,
and Renee Countryman
Psychology Department, Austin College
Abstract #13

Females, particularly mothers, seem to have a 'tend and befriend' response to stressors while it is thought that males have primarily a fight or flight response (Taylor et al., 2000; Taylor, 2006). Research indicates that fathers differ from non-fathers with overall lower levels of testosterone (Alvergne et al, 2009). To determine whether parental experience was associated with different stress responses to paternal stressors, the current study looked at responses in both pair-bonded fathers and non-fathers. Results suggest that all participants, whether a father or non-father, had increased cortisol levels after exposure to the stressors. Fathers had lower baseline levels of testosterone, but following the parental stressor, first-time fathers exhibited the largest increase in testosterone. This suggests that fathers with less parental experience may respond differently to stressors than experienced fathers or non-fathers .

Investigating Altered Ca^{2+} Homeostasis in *gal7* Δ and *gal10* Δ Mutants of *Saccharomyces cerevisiae*

Saman M. Najmi, Pido K. Tran, Connie Tran, and David Aiello
Biology Department, Austin College
Abstract # 14

Galactosemia is a condition in which patients are unable to metabolize galactose due to a deficiency in an enzyme in the Leloir pathway. Lack of the gene products of *GALT* or *GALE* causes an accumulation of galactose-1-phosphate (Gal1P) in their tissues. Similarly, *gal7* Δ and *gal10* Δ mutants of *Saccharomyces cerevisiae*, lacking the homologs of *GALT* or *GALE*, accumulate (Gal1P) when exposed to galactose. Mutants lacking the major isoform of phosphoglucosyltransferase accumulate glucose-1-phosphate (G1P), altering the balance between levels of G1P and glucose-6-phosphate (G6P). The imbalance of sugar phosphate levels in *pgm2* Δ mutants is correlated to observations of high total cellular Ca^{2+} in this mutant. The working model for the mechanism by which *pgm2* Δ mutants accumulate Ca^{2+} predicts that the imbalance of G1P and G6P levels leads to the hyperactivity of Pmc1p, the vacuolar Ca^{2+} /ATPase. This causes an increased sequestration of Ca^{2+} into the vacuole, depleting cytosolic and ER Ca^{2+} levels. Protein folding in the ER is a Ca^{2+} -dependent process, so as a result, there is a buildup of misfolded proteins in the ER. The Unfolded Protein Response (UPR) is induced to facilitate removal of these misfolded proteins. To replenish cytosolic and ER Ca^{2+} levels, a response is activated to facilitate the influx of extracellular Ca^{2+} . This Ca^{2+} is sequestered into the vacuole by the hyperactive Pmc1p. Deletion of *PMCI* in *pgm2* Δ mutants results in a partial suppression of the high total cellular Ca^{2+} phenotype, as well as a suppression of UPR. Interestingly, *gal7* Δ and *gal10* Δ mutants exhibit high total cellular Ca^{2+} and UPR, like *pgm2* Δ mutants. The goal is to investigate the similarity of the mechanism by which *gal7* Δ and *gal10* Δ mutants accumulate Ca^{2+} to that by which the *pgm2* Δ mutants accumulate Ca^{2+} .

Factors That Impact Victim Credibility Assessments In Trials Involving Sexual Abuse

Alexandra McLendon, Jordan Meredith, Lauren Saxon, and
Michelle Helfrich
Psychology Department, Austin College
Abstract #15

Research indicates that child sexual abuse is severely under-reported (London et al., 2005). One reason for low report rates is that abusers are often trusted family members, family friends, or community members. The perceived credibility of the child is thus crucially important for sexual abuse cases. Building on past research, this study investigated abuse frequency and involvement as either a victim or witness in a trial setting. Additionally, the gender of the reporting child was manipulated to explore whether males or females are perceived as more or less credible in sexual abuse cases. 123 undergraduates participated. This study was a 2 (Trial Witness Type: victim or witness) X 2 (Abuse Frequency: once or multiple times) X 2 (Child Gender: male or female) between subjects factorial. Participants read one of eight detailed trials based on their randomly assigned condition. The trials included a forensic interview and accounts from various people involved. Participants completed questionnaires where they rendered verdicts and evaluated the credibility of the child and defendant. Preliminary analyses showed that event frequency affected verdicts as well as child credibility ratings where victims that reported more abuse were perceived as less credible than those who reported one abuse incident. Verdicts correlated several judgments, including credibility ratings for both the defendant and victim. Child gender also affected ratings. The results underscore the need to examine factors that affect the perceived credibility of child victims and witnesses.

Using Click Chemistry to Attach Metal Complexes to Silane Based Monolayers on a Titanium Dioxide Nanoparticle Surface

Catherine McKenas and Karla S. McCain
Chemistry Department, Austin College
Abstract #16

Being able to attach inorganic complexes to organic surfaces is of great importance. Specifically, this project was focused on creating a metal dye complex to be attached to an organic surface that could one day be used in a Gratzel solar cell. Click chemistry was used in this project as a way to connect a metal complex to the organic silane monolayer. The Azide Alkyne Huisgen Cycloaddition approach was used. To monitor all reactions, an in-situ FT-IR spectroscopy analysis via a flow cell was performed. Ethynylferrocene (which has an alkyne functionality) was reacted with a silane monolayer with an azide functionality, which successfully connected the two moieties via a triazole bond. Two approaches were investigated: 1) the monolayer was first deposited onto the titanium dioxide nanoparticle surface, and then the ethynylferrocene was flowed over the surface to form the triazole bond, and 2) the click reaction was first performed in solution and then flowed over the titanium dioxide surface to form monolayers. Both approaches had their respective positive and negative attributes. Finally, different metal complexes were put on the surface and analyzed.

Temporal Response of Gut Microbiome to Bacitracin/Streptomycin Treatment in Wild-Type and PA28 γ ^{-/-} Mice

Tyler Liang, Brian Clinton, Connie Herrera, Nancy Musoke,
Joel Barrett, Lance Barton, and Kelly Reed
Biology Department, Austin College
Abstract #17

The composition of the gut microbiome is vital to understanding immunity and metabolism of the host organism and may be an important indicator of chronic disease. The microbial community within the gut is dependent on communication with the host organism. Previous research shows that PA28 γ , a proteasome activator, is involved in cell cycle regulation and immune homeostasis, which are essential processes of the colon. In this experiment, mice were treated with the antibiotics bacitracin and streptomycin for 10 days. Fecal samples were collected from wild-type (WT) and PA28 γ ^{-/-} (KO) mice before treatment (BA) and 3, 12, and 35 days after treatment (A3, A12, A35). DNA was isolated and the 16S ribosomal RNA gene, which can be used to classify bacteria, was analyzed using terminal restriction fragment length polymorphism (T-RFLP) and pyrosequencing. Both analyses showed that there was a significant effect of genotype and time point on the microbial community structure. A significant shift in community structure between WT and KO occurred from BA to A3, including a Firmicutes phylum abundance loss in KO and a change in the Bacteroidetes phylum composition in both WT and KO. Both WT and KO communities moved towards the BA profile from A3 to A35; however, the community structure of WT at A35 was more similar to the structure at BA than that of KO at A35. This study provides insight into how PA28 γ genotype may cause permanent changes in the gut microbiome after antibiotic treatment.

Galactic Astrophotography: Using the Adams Observatory to Establish a Procedure for Deep-Sky Imaging

Amy Anderson, Colton Turbeville, David Baker,
and Peter Hyland
Physics Department, Austin College
Abstract #18

The new 24-inch telescope in the Adams Observatory was installed in August 2013. Our goal for the Fall 2013 semester was to develop a systematic process for deep-sky imaging with this new facility. The procedure includes how to use the telescope, CCD camera, and editing software. One of the first things we learned was that taking a single image with the telescope wouldn't be nearly good enough, and wouldn't be in color. To remove enough of the noise to produce a good (color) image, we needed to take multiple images with different filters and combine them. After processing our images, we wrote a detailed guide to help future students. Using our guide, the next generation of Austin College astronomers will be able to take and process similar images without having to create an entirely new procedure. The two galaxies featured here are M74 (a spiral galaxy in Pisces) and NGC 5866 (a lenticular, "lens like" galaxy in Draco). These particular galaxies were chosen based on two main criteria. First (and most importantly) they were in a good position in the sky during the time and date we were able to observe, as the telescope takes much better images when the object being observed is near zenith, straight up. Secondly, they were different kinds of galaxies, and we wanted to explore the significance of the different structures. Specifically, we were looking for differences in the color of the galaxies, which we would find by looking at the differences between the brightness of the color pictures.

The Impact of Depression on Academic Performance

Amberlee Partridge and Ian MacFarlane
Psychology Department, Austin College
Abstract #19

Depression is a serious, yet common mental disorder that is especially prevalent among college students (Kitzrow, 2003). Depression may hinder a student's future success by reducing the ability to focus, remain motivated, or respond to learning opportunities. With a growing number of students reporting serious psychological problems on college campuses, there is a parallel increase in the need for updated research on the changing mental health needs of this population. This study investigated the relationship between depression and academic performance among 175 Austin College students. Participants were placed in either a non-depressed or depressed group based on responses to The Center for Epidemiological Studies Depression Scale-Revised (CESD-R Eaton et al., 2004). This study used mid-term assignment (e.g., tests, papers, projects) grades from the fall semester 2013 as the measure of academic performance. A series of three ANCOVA tests were conducted to determine whether or not there was a significant difference in average midterm score, lowest midterm score, and highest midterm score between the depressed and non-depressed groups when controlling for academic grade and gender. The results show, on average, the non-depressed participants reported significantly higher grades for their highest midterm score. Recommendations for practical applications of the findings and future research are discussed.

Investigating the Influence of PA28 γ upon the Mammalian Gastrointestinal Microbiome

Joel Barrett, Brian Clinton, Connie Herrera, Tyler Liang,
Nancy Musoke, and Lance Barton
Biology Department, Austin College
Abstract #20

Proteasomes selectively degrade intracellular proteins, affecting an array of biological processes (e.g. the immune response). Proteasome activators (PA) are required for proteasome-mediated degradation and play a significant role in substrate selection by proteasomes. The participation of proteasome machinery in the immune response provides a potential mechanism for proteasomes to affect vital host-microbial relationships. The majority of commensal microbes are localized in the gastro-intestinal (GI) tract, collectively called the GI microbiome. The effect of PA28 γ , a proteasome activator, upon the GI microbiome was explored through administration of antibiotics and differential microbiological techniques. PA28 γ -deficient mice exhibited similar microbial compositions to controls initially; however, qualitative and quantitative differences in response to antibiotic treatment were observed, markedly nine and thirty-five days after antibiotic treatment. These results demonstrate that PA28 γ has an influence upon the immune response visible through disturbance of the GI microbiome by antibiotics.

Syntheses of 1,2-di(4-pyridyl)glycol Platinum (II) Dithiolene Building Blocks

Daniel Park and Bradley Smucker
Chemistry Department, Austin College
Abstract #21

In our syntheses of building blocks for light-harvesting supramolecular coordination complexes using diimine platinum(II) dithiolene constructs, we used the 1,2-di(4-pyridyl)glycol, dpyg, ligand to form $[\text{Pt}(\text{dpyg})_x(\text{mnt})]$ ($x = 1$ or 2 , mnt = maleonitriledithiolate). All compounds exhibit strong visible absorbance and a reversible reduction ($E^0 = -0.32\text{V}$) was observed for the monotonically coordinated dpyg ligand.

Examining the Role of Sexual Orientation in the Relationship Between Religious Affiliation and Ethnic Romantic Partner Preferences

Mikayla Hill-Elliott, Ashley Abraham, Lisa Brown,
and Jazmin Kelly
Psychology Department, Austin College
Abstract #22

Religion and spirituality may differ in the role they play in sexual minorities' current lives. For instance, some view their religious traditions and beliefs as an important and integral part of identity, while others do not (Maynard, 2001). Previous studies from our lab found that religious consistency (i.e., match between religion of upbringing and current religion) predicts ethnic ingroup romantic partner preferences. Given that many major religions condemn homosexuality we proposed that religious consistency would be a factor in ethnic partner preferences for heterosexuals but not for homosexual minorities. Participants from four campuses completed an online survey regarding sexual orientation, religious consistency with regard to current religion and religious upbringing, and ethnic ingroup romantic preferences. Regression analyses revealed that religious consistency did not moderate the relationship between sexual orientation and ingroup preferences contrary to prediction. Follow-up analyses revealed that religious consistency mediated the relationship between sexual orientation and ingroup preferences.

The Role of PA28 γ in p38-Mediated Cell Fate Decisions

Anna Sliz and Lance Barton
Biology Department, Austin College
Abstract #23

PA28 γ is a proteasome activator that facilitates protein degradation by 20S proteasomes. Many of the proteins selected for degradation by PA28 γ -proteasomes are involved in the regulation of the cell cycle and apoptosis. Some of the known targets of PA28 γ -proteasomes include p21^{Cip1}, p16^{INK4}, p19^{ARF}, and p53. Murine Embryonic Fibroblasts (MEF) lacking PA28 γ display a slower rate of cell cycle progression coupled with increased rates of spontaneous apoptosis. However, these same cells have increased viability and decreased caspase activity, compared to controls, after exposure to genotoxic stressors. These data indicate a potential role for PA28 γ in the signaling pathways that control stress responses, cell survival, and apoptosis. In order to further investigate the role of PA28 γ in cell fate decisions, we chose to further investigate the regulatory relationship between PA28 γ and the mitogen activated protein kinase (MAPK) p38 pathway. Previous research has established that in the absence of PA28 γ , p38 is more stable and more highly activate indicating that PA28 γ regulates p38 either directly or indirectly however the underlying mechanism of regulation is unclear. Based on preliminary data, the phosphorylation kinetics of p38 in the absence of PA28 γ indicate a potential mechanism for PA28 γ in p38 mediated cell fate decisions.

Effect of fMRI Scan Presentation on Perceptions of Homosexuality

Whitney Russell and Renee Countryman
Psychology Department, Austin College
Abstract #24

The primary purpose of the present study was to see if reading an article online produces different results than reading an article on paper and if religious affiliation plays a role in the openness of a person to the biological basis of homosexuality. McCabe and Castel (2008) found that brain images can persuade individuals to accept information more easily than articles that do not contain brain images. In our study, an article on the biological basis of homosexuality was given to participants to read in an online survey. In the first condition, participants only read the article. In the second condition, participants read the article and were given a bar graph that represented the data. In the third condition, participants read the article and were given an fMRI scan and bar graph to represent the data.

Quantifying Ammonia Oxidizing Archaea/Bacteria Ratios to Monitor Prairie Restoration Progress

Anne Booker, Kelly Reed, and Keith Kisselle
Biology Department, Austin College
Abstract #25

The Blackland Prairie has been severely degraded, and less than 1% remains today. A local restoration effort at Austin College's 100 acre Sneed Environmental Research Area has been ongoing for 11 years. The restoration managements are controlled burning, periodic cow grazing, and a combination of the two. Nitrogen is typically a limited resource that is necessary for plant and microbial growth. Thus, its cycling rate can dictate nitrogen availability. Two specific groups of microbes involved in nitrogen cycling and potentially affected by restoration managements are ammonia oxidizing archaea (AOA) and ammonia oxidizing bacteria (AOB). These microbes oxidize ammonia to nitrite, which controls the nitrification process of the nitrogen cycle. AOA and AOB prefer different niches, thus theoretically, AOA will prefer "prairie-like" soil that has lower concentrations of ammonia, while AOB will prefer "pasture-like" soil that contains higher concentrations of ammonia. Therefore, the concentrations of AOA and AOB have the potential to act as a way to quantitatively monitor the restoration progress. Quantitative PCR of the *amoA* gene was used to determine AOA and AOB soil concentrations. Surprisingly, there was a trend toward more AOB in the undisturbed prairie soils than the pasture soils. In addition, there was no statistical difference in the AOA:AOB ratio among any of the different managements. These data suggest that there is not a management dependent effect on the ratio of soil AOA:AOB at the Sneed Prairie.

Arbuscular Mycorrhizal Fungi Colonization in the Sneed Prairie

Morgan Beeman, Xuanru Ding, and Bishnu Twanabasu
Biology Department, Austin College
Abstract #26

Arbuscular Mycorrhizal (AM) fungi, colonizing over 90% of plants, are found in all terrestrial ecosystems. They form a symbiotic association with vascular plants and provide increased access to soil nutrients and water in exchange for host derived photosynthates. AM fungi produce asexual spores, which will recolonize plants after adverse environmental conditions. Spore abundance indicates the health for this association and the ecosystem. Since 1997, Austin College has been working to restore a former 100-acre farm to its original Blackland prairie state. The Clinton and Edith Sneed Environmental Research Area is currently being managed in three varying ways. Each plot is a variance on two restoration techniques: prescribed burnings and controlled grazing with cattle. Plots are managed either by fire, grazing, or fire and grazing. To determine the effects of each management technique, we obtained soil samples from each restoration plot and quantified the number of AM spores. Our goal of this study is to determine the health of the AM association via spore abundance in each type of managed plot. This will help to better understand restoration techniques and management of prairie ecosystems.

Probing TauD Active Site Chemistry with Synthetic Analogues

Connie Herrera and Karla McCain
Chemistry Department, Austin College
Abstract #27

The catalytic oxidative properties of the Fe(II)N2O1 complex in the presence of O₂ and α -ketoacid were determined through studies utilizing anthracene and cyclohexene as substrates. Both assays illustrated an inverse relationship between complex concentration and substrate oxidation turnover. The 9,10-dihydroanthracene (9,10-DHA) oxidation to anthracene, anthrone, and anthraquinone demonstrated high turnover numbers at low catalyst concentrations and lower turnover numbers at higher concentrations of complex (R²=0.9942). This was also demonstrated for the oxidation of cyclohexene to cyclohexene oxide, 2-cyclohexen-1-one, and 2-cyclohexen-1-ol (R²=0.9424). A new Fe(II)N2O1py TauD model was synthesized and characterized with HNMR.

Using EMS Mutagenesis to Identify Suppressors of Calcium Homeostasis Defects in a *pgm2Δ Saccharomyces cerevisiae* Strain

Akshaya Selvamani, Evann Wu, Rachel Jimenez, Courtney Goldstein, and David Aiello
Biology Department, Austin College
Abstract #28

Phosphoglucomutase (PGM) is a key enzyme in carbohydrate metabolism that interconverts glucose 1-phosphate (G1P) and glucose 6-phosphate (G6P). In *Saccharomyces cerevisiae*, the loss of the major isoform of PGM results in an altered ratio of G1P to G6P when galactose is utilized as a carbon source. Concomitantly, the *pgm2Δ* cells exhibit an increase in total cellular Ca^{2+} levels compared to the wild type cells and improper folding of ER resident proteins indicative of altered intracellular Ca^{2+} homeostasis. The current working model proposes that the altered G1P/G6P ratio increases Ca^{2+} sequestration into the vacuole via the Ca^{2+} -ATPase, Pmc1p which results in depletion of cytosolic and ER/Golgi Ca^{2+} levels. This in turn activates a signal for Ca^{2+} uptake across the plasma membrane. The objective of this project is to identify the mechanism linking these two seemingly unrelated processes of carbohydrate metabolism and Ca^{2+} homeostasis. Our approach was to undertake an EMS mutagenesis screen to identify suppressor phenotypes of the *pgm2Δ* mutation. We isolated sixteen candidate strains each exhibiting a suppressor phenotype, referred to as “suppressor of pgm2Δ defects” (*spd*). Of the sixteen *spd* strains, eight are resultant of a recessive, single point mutation. Previously, two of the strains were screened with a genomic library identifying *SPT4*, a gene from chromosome VII, capable of suppressing the *spd* phenotype. By complementation screen, the other six strains showed no suppression of their *spd* phenotype by *SPT4*. A genomic library screen from one of the *spd* strains yielded an 11.6 kb fragment from chromosome VII capable of suppressing the *spd* phenotype. The work presented chronicles the progress in identifying and confirming the gene of interest from one *spd* strain.

Perceiving Ethnic Identity from People's Partner Preferences: An Extension with Asian-White Couples

Jazmin E. Kelly, Dian Dinh, Ashley Malcom, and Lisa Brown
Psychology Department, Austin College
Abstract #29

Previous research has investigated the effects of phenotypic prototypicality, i.e., how much a person looks like a typical member of his or her racial or ethnic group. For example, people tend to infer that someone who is more prototypical looking for his/her ethnic group has higher ethnic identity than someone who is less prototypical looking (Wilkins, Kaiser & Rieck, 2010). In our previous research using pictures of Black-White, Black-Black and White-White couples we found that perceivers make judgments about a target's ethnic identity based upon the ethnicity of his/her romantic partner. The current study is a replication using pictures of Asian-White, Asian-Asian and White-White couples. Results were consistent with our previous findings showing that individuals in interethnic couples are perceived as having lower ethnic identity than people in monoethnic couples. Future research will investigate possible mediators of this effect.

Reawakening the Regenerative Potential of the Mammalian Heart

Karisma Sheth¹, Hesham A. Sadek,² Ahmed I. Mahmoud²,
Fatih Kocabas², Shalini A. Muralidhar², and Suwannee Thet²

¹Biology Department, Austin College

²University of Texas Southwestern Medical Center at Dallas

Abstract #30

Heart failure is a costly and deadly disease affecting over 5 million Americans. At the core of the pathophysiology of heart failure is the inability of the adult heart to regenerate following injury. Recently, it has been shown that neonatal mice hearts are capable of complete regenerative potential following cardiac injury mediated by cardiomyocyte proliferation, which is lost by day 7 after birth. In an effort to determine the mechanism of postnatal cardiomyocyte proliferative and regenerative arrest, a gene array following neonatal cardiac injury was performed. Meis1 was identified as a potent regulator of mammalian cardiomyocyte proliferation. Meis1, which belongs to a homeodomain family of transcription factors, is required for normal hematopoiesis, but little is known about its role in the heart. It's found that Meis1 is expressed in cardiomyocytes during postnatal cell cycle arrest. To further explore the role of Meis1 in postnatal heart maturation and cardiac regeneration, cardiomyocyte-specific Meis1 knockout mice were generated. Loss of Meis1 resulted in robust cardiomyocyte proliferation in the adult heart and improved cardiac function following myocardial infarction. In contrast, transgenic over-expression of Meis1 in the neonatal heart repressed cardiomyocyte proliferation and inhibited the neonatal cardiac regenerative response following myocardial infarction. These results identify Meis1 as a key regulator of postnatal cardiomyocyte cell cycle arrest and as a potential therapeutic target for cardiac regeneration.

Using Infrared Spectroscopy to Examine Structure-Function Relationships in a New Class of Bisurea Organogelators with Branched Ester Tails

Ilish DeWitt, Christine Ritchie, Robyn Wright,
and Karla McCain
Chemistry Department, Austin College
Abstract #31

Structure-function relationships in a new class of bisurea organogelators with ester tails were studied by infrared spectroscopy (FT-IR). The number of carbons before and after the ester linkage was varied as was whether the ester group served as a branch point. This study seeks to better understand the relationship between organogelator molecular structure and overall gel organization. Organogels have potential application in the production of paint and cosmetics, in the transportation of fuel, and in medication. Solid organogelator was dissolved in benzene, and spectra were acquired in the IR using a liquid cell with sodium chloride windows. The amide region was used to determine the relative amount of hydrogen bonding, and the methylene bending region was used to determine the relative amount of conformational deformations in the alkyl tails. The carbonyl stretch due to the ester was also examined to determine the extent of any dipole interactions in which it was involved. It was found that only molecules with branch points formed gels and that molecules with longer tails gelled at lower concentrations. There was also considerable evidence of dipole interactions between the carbonyls in the esters with themselves or with the ureas.

Custom Calibration for the CS616 Soil Moisture Sensor at the Austin College Weather Station: Gravimetric Measurements and Temperature Dependence

Albert Chung, Amy Anderson, Lindsay Bechtel,
and David Baker
Physics Department, Austin College
Abstract #32

The Soil Moisture Project has been under research by Austin College students since 2010. An issue was reported with one of the instruments at the Austin College Weather Station, the Campbell Scientific CS616 Water Content Reflectometer. The CS616 was recording measurements that were impossible to obtain. The 2010 and 2011 research groups established that the CS616's ability to record data is affected by soil temperature and soil moisture. A calibration equation was provided by the 2011 group which was more successful than the suggestions offered by Campbell Scientific. This report discusses how we took more soil samples to increase the population pool for a multiple linear regression in order to produce a more accurate calibration.

Docking the tail-anchored protein TREX1 via TRC40 into the ER

Rachel Jimenez¹, Martin Kucej², and Nan Yan²

¹Biology Department, Austin College

²University of Texas Southwestern Medical Center

Abstract #33

Aicardi-Goutières Syndrome (AGS) is an autoimmune disease that has viral congenital phenotypes and results in brain and heart inflammation (Crow et al., 2009). Deficiency of three prime repair exonuclease I (TREX1) has been linked to AGS. It is believed that the exonuclease activity of TREX1 is responsible for degrading endogenous cytosolic nucleic acids, a phenotype of AGS patients, to avoid activation of the host immune system (autoimmunity). TREX1 is a 3'-5' exonuclease localized in the lumen of the endoplasmic reticulum (ER) in mammalian cells. Preliminary data has shown that TREX1 localizes to the ER. AGS patients with TREX1 mutations affecting the transmembrane domain (TMD) coding region have normal DNase activity, yet TREX1 is mislocalized (Le-Kirsch et al., 2007). Therefore, functional yet mislocalized TREX1 still results in AGS. Therefore proper localization and proper insertion into the ER is needed for proper TREX1 function; this is not mechanistically understood, yet. Interestingly, the TREX1 TMD is at the carboxy terminus and does not contain a signal sequence, excluding it from the typical co-translational ER insertion pathway. Therefore, we hypothesize that TREX1 is post-translationally captured by tail-anchoring (TA) machinery and recruited to the ER membrane for insertion. Co-immunoprecipitations of TREX1 with TA-machinery proteins with tagged constructs display the interaction between TREX1 and TRC40, a key protein in the TA-machinery. This suggests that TREX1 does indeed use the TA pathway. By understanding TREX1 ER insertion, simulations of how mislocalized TREX1 contributes to AGS can be constructed. More broadly, this can lead to a better understanding and further investigation of the role TREX1 in innate immunity.

Student Oral Presentations
Block I
9:00 – 10:15 a.m.

• Repeated measures ANOVA

	F	η^2	P
Like	3.88	.15	.00
Potent	3.31	.13	.01
tract	11.26	.35	.00
	4.47	.18	.00
	3.11	.13	.01
	5.16	.21	.00
	7.46	.27	.00

Research Highlights from the Biology Department

Moderator: David Aiello
Block I: 9:00 – 10:15 a.m.
Wright Campus Center 231

Student Presenters:
(In Order of Presentation Time)

Taliesin Kinser
Kristofer Taylor
Courtney Goldstein

The Relationship of Small Mammals With the Invertebrate Community of the Blackland Prairie

Taliesin Kinser
Biology Department, Austin College
Abstract #34

The blackland prairie ecosystem in North Texas is home to many invertebrates and several small mammal species. This study investigated the role small mammals play in structuring invertebrate community populations by setting up enclosure fences that prevented small mammals from passing through portions of a prairie. We set live traps for mammals during a six-week study period (October-November of 2013) and collected samples of invertebrates in each sample location every week using pitfall traps. We found 3 different small mammal species in the study area: *Sigmodon hispidis*, *Peromyscus maniculatus*, and *Cryptotis parva*. Of the 13 orders of invertebrate species collected, 7 were common (Hymenoptera (social insects), Coleoptera (beetles), Diptera (flies), Hemiptera (true bugs), Orthoptera (grasshoppers), Araneae (spiders), and Colembola (springtails)). No differences were found between control and enclosure subplots in numbers of total invertebrates or numbers of any individual taxon. However, when investigating temporal effects on the number of invertebrates, we found significantly fewer invertebrates in the 1st week of the study than in the 6th week. Since mammals were found in some enclosures in the first 3 weeks, their presence may have skewed the data, suggesting that the study period was too short for differences in invertebrate numbers to become apparent. With the enclosures now operating, we expect future data obtained over a longer period of time to yield potential differences in numbers of total invertebrates and numbers of individual taxa in the enclosures compared with the control areas, revealing small mammals' effects on invertebrate community structure.

Faculty Director: Jessica Healy

Patterns of temporal gland streaming in African elephants (*Loxodonta africana*) within Tarangire-Manyara ecosystem, Tanzania

Kristofer Taylor
Biology Department, Austin College
Abstract #35

Stress, a physiological response to environmental conditions has serious implications on health and fitness of African elephant populations. In elephants, stress can be identified through the presence of temporal gland streaming; however the main causes of stress in African elephants are not well understood. Field surveys in Lake Manyara National Park, Manyara Ranch, and Tarangire National Park were used to gather data on sex, age, group size, group type, location, and season. A generalized linear mixed model with random effects was used to determine and rank the variables with influence on stress. It was found that elephant group type and group size were the most contributing components of stress. Factors such as sex and season played a less significant role in stress levels within elephants. Use of non-invasive and low-cost methods of determining stress levels, such as temporal streaming, in African elephants have the potential to be widely applied in elephant research and management.

Faculty Sponsor: Lance Barton

Methylglyoxal supresses *pgm2Δ* growth defects

Courtney Goldstein
Biology Department, Austin College
Abstract #36

Strains lacking the major isoform of phosphoglucomutase (*pgm2Δ*) exhibit altered calcium homeostasis. Pmc1p hyper-sequesters calcium into the vacuole, depleting cytosolic concentrations of calcium. The endoplasmic reticulum (ER) is thought to be depleted of calcium which leads to many of the defects observed in *pgm2Δ* mutants. A previous study has shown that methylglyoxal (MG), a toxic byproduct of glycolysis, is able to raise cytosolic concentrations of calcium. We examined if the addition of exogenous MG could rescue *pgm2Δ* growth defects on various types of media that *pgm2Δ* mutants are known to exhibit growth sensitivity. We found that MG partially rescues *pgm2Δ* growth defects on high calcium; furthermore, MG rescues the *pgm2Δ* growth defects on low calcium and high sodium but not on high manganese or high magnesium. Current work is seeking to determine if MG is affecting a high affinity calcium transport across the membrane.

Faculty Director: David Aiello

Developing a Framework for
Future Research in
Political Science:
Theory and Hypothesis Creation

Moderator: Dr. Nathan Bigelow
Block I: 9:00 a.m. – 10:15 a.m.
Wright Campus Center 254

Presidential Success: Counter-Normative
Advantages
Dale Abraham

Humor as an Information Gathering Aid in
Presidential Elections
Katherine Harkey

Homeowners Associations and Race in America
Madison Messinger

Partisan Baggage: The Politics of
Judicial Nominations
Kayla Stamas

Suspension: The Literary Journal as Cultural Project

Moderator: Peter Anderson
Block I: 9:00 a.m. – 10:15 a.m.
Wright Campus Center 255

"Suspension" magazine is Austin College's award-winning literary magazine. Student-run, and totally focused upon work produced by Austin College students, alumni/ae, and, occasionally, faculty, it has reached a level of quality and achievement that places it among the best in the nation. This presentation will feature readings from the current issue, together with a brief lecture by the editor on the aims of the journal as a cultural representative of Austin College.

Student Presenters:

Jeesoo Lee
Sarah Martin
Robert Dunlap

Presentations from CML and Religion

Moderator: Todd Penner
Block I: 9:00 a.m. – 10:15 a.m.
Ida Green 112

Student Presenters:
(In Order of Presentation Time)

Blair Whalen
Michele Keller
Caitlin Caswell

Psychopathological Perspective on Hikikomori

Blair Whalen

Classical and Modern Languages Department, Austin College
Abstract #37

In this paper, I investigate hikikomori (acute social withdrawal) from a psychopathological perspective, arguing that mental illness plays a part in the phenomenon.

Faculty Director: Scott Langton

Maghrebian Literature as (not) Media

Michele Keller

Classical and Modern Languages Department, Austin College
Abstract #38

This paper will broach two novelistic treatments of a subject both important and vexed, both timely and (for the Western critic) fraught with danger: the (mis)treatment of women in the Third World post-colony. The novels under discussion—Driss Chraïbi's *The Simple Past* and Assia Djébar's *Fantasia: An Algerian Cavalcade*—prove, by any conventional standard, “difficult” to read and even harder to understand. How so? And why?

Its search for an answer, this paper will adopt an unconventional perspective. It will apply to Chraïbi and Djébar the categories of analysis commonly used in Media Studies: text, audience, social context, and industry (...where “text” denotes the content itself; “social context” the environment in which it emerges; “audience” the targeted consumer group(s); and “industry” the underlying profit motive). It will demonstrate that in both instances, the “text” critiques its status as a medium of communication and exchange. Self-referential, indirect, opaque, these novels dramatize their own inability to find a suitable audience (and thus to make money for their publishers); and this because the text that they both aspire to become—a text that might let the oppressed speak directly, transparently for themselves and to a broader audience—that text proves impossible against the current social backdrop. This results in a new aesthetic paradigm, namely that of the “successful failure” which, by the criteria of a standard media analysis, would seem a patent contradiction in terms.

Faculty Director: Andy Pigott

Christianity and Non-normative Gender Identification

Caitlin Caswell
Religious Studies Department, Austin College
Abstract #39

Christianity has responded to persons with non-normative gender identification in a distinct set of ways, ranging from the historic focus on women in leadership roles and those who are born intersex (more colloquially known as hermaphrodites), to the more recent focus on homosexuality. This paper specifically focuses on the emerging field of transgender studies and the variety of Christian responses to this relatively new identifier, which was only coined within the last several decades. As an area that is less understood, even within the LGBT community, studying the scope of Christian opinions—using both literature and personal interviews—allows for a basic understanding of how gender-traditional, gender-moderate, and gender-nontraditional communities respond to diversions from the gender norm.

Faculty Director: Todd Penner

Student Oral Presentations
Block II
10:15 a.m. – 11:30 a.m.



Presentations from the English Department

Moderator: Carol Daeley
Block II: 10:15 a.m. – 11:30 a.m.
Wright Campus Center 231

Student Presenters:
(In Order of Presentation Time)

Krista Jarrell
Jeesoo Lee
Lauren Bolinger

I Solemnly Swear that I am Up to No Good

Krista Jarrell
English Department, Austin College
Abstract #40

My title refers to mocking oaths sworn by characters in *Harry Potter and the Prisoner of Azkaban* (1999) who subvert the usual purpose of oaths: to tell the truth, to behave morally (Rowling 192). My historicist project aims to assess whether a Renaissance English loyalty oath, the Jacobean Oath of Allegiance (1606), required English Catholics to swear that they too were up to no good, and it asks how Shakespeare's romances, written after 1606, participated in the fierce controversy over the Oath.

Faculty Director: Alex Garganigo

Open Heart Surgery in a Cocktail Dress: Periscoping Anne Sexton's Perspectives on Poetry

Jeesoo Lee
English Department, Austin College
Abstract #41

In coming to terms with Anne Sexton's work and the implications of her death, it is all too easy to consider her as writing out of emotional distress and mental suffering. The overshadowing of the facts of her life suggest the possibility of Sexton's supposed lack of ability to see the boundaries between creativity and self-destructive tendencies; it may even seem that there is a correlation between poetry and the poet as deleterious influences on each other. Yet, in a letter written in 1966, Sexton herself asserts that "suicide is, after all, the opposite of the poem" (7). It is my contention in this paper that it is a mistake, and that it does Sexton a great disservice to read her works solely through the lens of her depression. Though it is true that her first significant poetic endeavors came at the suggestion of her therapist, her initial encounters with poetry predate any recorded instances of psychotic episodes. In addition, her seemingly late and nontraditional entrance into the literary world may make Sexton seem like an "accidental" poet — a notion held by critics like Helen Vendler. However, if we understand and read Sexton separately from her death, we find that she reveals herself as a force of natural energy. Through examining letters written to friends and looking closely at her interviews, Sexton emerges as a poet of life, not death. She wrote out of necessity to free herself from a life she recognized as alien to her own essence. In this way, she manifested an incredible attention to prosody and form. Through her highly developed confessional verse, Sexton gave herself the opportunity to take control of a life she feels that she has lost. I argue that the poetry of Anne Sexton is not a poetry of pathology, but of a quest for an abiding truth.

Faculty Director: Peter Anderson

The Ego-Centric Predicament and Class-Driven Alienation in Tennyson's *Maud: a Monodrama* and T. S. Eliot's "The Love Song of J. Alfred Prufrock"

Lauren Bolinger
English Department, Austin College
Abstract #42

Alienation is a timeless element of the human condition, crossing over centuries to bridge the generational gaps between periods such as the Victorian and Modern. This paper analyzes two poems by authors quintessential to their respective eras: Tennyson's *Maud: a Monodrama* (1855) and T. S. Eliot's "The Love Song of J. Alfred Prufrock" (1917) to argue that the time-transcendent problem of alienation is made possible by society's persistent class-driven social structure and the pressure to constantly adhere to one's social status. The internal conflict engendered by craving acceptance into the very system that cripples individual freedom when combined with the oppressive nature of the status quo leaves people, no matter the era, torn between an effort to escape and a desire to belong. The philosophical notion of the ego-centric predicament, that the only reality that exists is that which we perceive, is key when studying two texts (a monodrama and a monologue) delivered by solitary speakers disillusioned by their societies. Relying heavily upon psycho-analytical and biographical-historical analysis, this paper utilizes both intrinsic and extrinsic criticism to investigate points of connectivity between these two seemingly unrelated works.

Faculty Director: Roger Platizky

Current Research in Psychology

Moderator: Renee Countryman
Block II: 10:15 - 11:30 a.m.
Wright Campus Center 254

Student Presenters:
(In Order of Presentation Time)

Maddisson Elizardo
Risa Rylander
Stephanie Kutler

Using Behavior Analysis in the Real World – Experiences in Applied Psychology

Maddisson Elizardo and Risa Rylander
Psychology Department, Austin College
Abstract #43

We will present on our experiences applying Behavioral Analysis in the field as experienced through a two semester sequence on Applied Behavioral Analysis in the Psychology Department. A discussion of the principles of Behavioral Analysis and its practical applications in the treatment of behavioral deficits will be covered as well as some of the ethical considerations associated with working with clients and patients.

Faculty Director: Anne Rowland

Perceptions of Non-Prescription Adderall Use and Academic Ability in College

Stephanie Kutler
Psychology Department, Austin College
Abstract #44

Non-prescription Adderall use has become common among students. Oftentimes, Adderall is used without a prescription by students who believe it enhances cognition, memory, and concentration (Arria & DuPont, 2010). The current study looks at the ways that perceptions of Adderall use are related to academic attitudes. Data were collected using an electronic surveying tool from 151 undergraduates. To measure perception of Adderall use, we developed scales composed of two parts. First, a series of vignettes portrayed students using Adderall without a prescription under various conditions (cramming for a test, writing a paper, etc.); follow-up questions assessed the extent to which participants believed that Adderall contributed to performance in the vignettes. Second, the Attitudes toward Adderall Questionnaire (ATAQ) assessed views of non-prescription Adderall use in an academic context, with higher scores indicating greater support or acceptance for using Adderall. Responses to the vignettes and to the ATAQ were compared to existing questionnaires, which measured variables such as general support for cheating (Allmon et al., 2000). Results supported the reliability and validity of our Adderall perception measures. Additionally, results revealed that participants with more tolerance for cheating were also more supportive of Adderall use and tended to downplay the effects of Adderall on performance. These findings were expected as both non-prescription Adderall use and cheating involve the use of external measures to improve performance without necessarily increasing ability, understanding, or effort. Implications and directions for future research are discussed.

Faculty Director: Peter Marks

Math and Physics Research Presentations

Moderator: Aaron Block
Block II: 10:15 – 11:30 a.m.
Wright Campus Center 255

Student Presenters:
(In Order of Presentation Time)

Lindsay Bechtel and Chris Tanner
John Donor
Kusha Mohammed

Properties of Gold and Palladium Thin Films at Nanoscale

Lindsay Bechtel¹, Chris Tanner¹, and Mike Kozlov²

¹Physics Department, Austin College

²University of Texas at Dallas

Abstract #45

When gold and palladium films have a thickness below 100 nm they begin to have different optical and electrical properties than in bulk. In our project, we deposited thin films by sputtering onto glass. We made a set of 12 gold thin films ranging from 2 to 50 nm and 5 sets of palladium thin films ranging from 5 to 40 nm. These films were characterized through electrical and AFM measurements and transmittance spectroscopy.

Faculty Director: Andra Troncalli

Variable Star Photometry from the Adams Observatory

John Donor
Physics Department, Austin College
Abstract #46

The focus of this research was developing a reliable methodology for acquiring and analyzing photometric measurements at the Adams Observatory. Astronomical photometry is the process of quantifying light from an object in a certain range of wavelengths. This research focused on photometry of variable stars. Variable stars are unstable stars whose brightness changes over time. Measurements of Beta Cepheid and SX Phoenicis type variable stars were taken during fall 2013 and January 2014, using a green astrophotography filter and a Johnson-Cousins V filter. Beta Cepheids have periods of approximately 2 to 14 hours and small changes in brightness. In contrast, SX Phoenicis variables generally have periods <2 hours and large changes in brightness. Measurements were taken with a monochromatic CCD camera using the 24" telescope at the Adams Observatory. Photometric analysis of the images was performed with Maxim DL and photometric data was collected into light curves, which show changes in brightness over time.

Faculty Director: Peter Hyland

Staircase Metrics in Space-Time Geometries

Kusha Mohammadi
Math Department, Austin College
Abstract #47

After a brief introduction to this general category of systems with staircase-function metrics (formerly, 'Snell geometry') and its natural methodology (which contrasts considerably with that of differential geometry), we discuss an extension of the scheme to space-time geometries. Focusing on systems where the underlying parameter space is the 2-plane, we establish metrics and derive formulas that lead to straightforward constructions of a large variety of semi-complete (or complete) time-like geodesics. These can be used, for example, to construct fully time-like asymptotic polygons. We demonstrate the construction of such complete geodesics via two sub-cases; the latter sub-case essentially entails 'staircase versions' of general (1,1)-FLRW (Robertson-Walker) metrics in general relativity.

Faculty Director: Jack Mealy

What Makes Independent Media "Indie"? A Selection of Video Essays

Moderator: Erin Copple Smith
Block II: 10:15 a.m. – 11:30 a.m.
Ida Green 112

The label of “indie” has become omnipresent in contemporary media—from music groups like Mumford & Sons to films like *Moonrise Kingdom*. But what does “indie” really mean? The students in Fall 2013’s Media Studies course “The Independence of Independents” spent the semester considering the nature of “independent” media—examining “indie” music, film, and TV to figure out what independent media is all about. Under consideration were the institutional structures of media production, distribution, and exhibition that gave rise to the term, as well as the aesthetic qualities that have come to mark media as “indie.” For their final projects, students created video essays in which they analyzed a specific media text they consider independent, building an argument centered on the components of the text that mark it as “indie.”

Video Essays

Bottle Rocket by Kyle Parker, Ali Center, and Alex Morano
Garden State by Ellie Cary, Savannah Hardin, and Reid Rose
Pulp Fiction by Kenny Herbert, Kellie Day, and Taylor Greenwalt
Secretary by Marimar Hernandez-Jaimes, Madeleine Mannix, and Gaby Margocs
Purity Ring by Skyler Highsmith, Mason Makarwich, and Maeve Nichols
Fez by Easton Willis, Daniel Graham, and Jonathan Dittman

Prospects and Challenges of Undergraduate Research: Faculty and Students in Conversation

Moderators: Todd Penner,
Renee Countryman, Mark Monroe, and
John Richardson
11:30 a.m. – 1:30 p.m.
Wright Campus Center 231
Lunch Provided

The focus of this lunch conversation is how students get involved in research and undergraduate scholarship at Austin College and how it impacts their education. The panel will feature faculty representatives from various academic divisions and students who have conducted research or done creative projects. Students will share their reflective stories of doing research as an undergraduate and the personal and professional impacts of their experiences.

Student Oral Presentations
Block III
1:45 p.m. – 3:00p.m.



Research Highlights from the Communication, Media Studies, and Theatre Department

Moderator: Liz Banks
Block III: 1:45 p.m. – 3:00 p.m.
Wright Campus Center 231

Student Presenters:
(In Order of Presentation Time)

Lizzy Lincoln
Stephanie Schultz
Anika Payne

Canon Fodder: Thornton Wilder's "Our Town" and American Ethos

Lizzy Lincoln
Communication, Media Studies, and Theatre Department,
Austin College
Abstract #48

Often, Thornton Wilder's "Our Town" is relegated, in general American consciousness, to the status of folksy, antiquated love letter to small-town America. Grover's Corners, New Hampshire, the fictive town at the heart of Wilder's most enduring work, seems, to modern sensibilities, quaint, even backwards.

Why, then, does "Our Town" remain one of the nation's most produced plays, averaging over 600 licensed productions per year?

Through recontextualization by brave directors, actors, and Wilder's own awareness of the liminal space in which his play exists, the play survives in American consciousness. It endures, often taught in schools where it is defanged and reduced to so much trite jingoism. It endures, reimagined in more challenging ways, often most effectively, on stage. No matter how it is represented and served up, undoubtedly, it does endure.

My thesis is an exploration of "Our Town's" enduring relevance throughout the years. Through analysis of several filmed versions, Wilder's own notes on American culture, and examination of "Our Town's" place in cultural canon, we find the secret to the play's success and endurance.

Faculty Director: Kirk Everist

The Medicalization of Women's Sexuality: Then and Now

Stephanie Schultz
Communication, Media Studies, and Theatre Department,
Austin College
Abstract #49

As dramaturg, I am responsible for researching and synthesizing information that will provide historical, social, and psychological context to the Austin College Theater Production of *In the Next Room* or the vibrator play, by Sarah Ruhl, which will run April 17 – 19. My presentation today will focus on the history of the medicalization of women's sexuality, from the Victorian era, where the vibrator was used as a clinical treatment for Hysteria, through today, where legislation still exists in some states banning "any device designed or marketed as useful for the stimulation of human genital organs." This will be followed by a short scene from the play, read by the cast of our upcoming production.

Faculty Director: Vanessa Baker

Rocky Horror vs. The Heterosexual Sphere

Anika Payne
Communication, Media Studies, and Theatre Department,
Austin College
Abstract #50

Our society operates in something called Public Spheres. The dominant sphere in society today is a Heterosexual or Heteronormative one. Within public spheres, there can be something called a Counter-public, which is a sphere made up of marginalized people who operate outside the dominant sphere. There are many ways to create and expand Counter-public spheres, and theatre is one of them. Throughout my presentation, I will be discussing what makes the 'cult' that follows The Rocky Horror Picture Show a counter public sphere in a Heteronormative sphere, how the theatricality expands that sphere, and what would need to happen for The Rocky Horror Picture Show to be considered a public sphere in its own right

Faculty Director: Liz Banks

Research Highlights from the History and Economics and Business Administration Departments

Moderator: David Griffith
Block III: 1:45 p.m. – 3:00 p.m.
Wright Campus Center 254

Student Presenters:
(In Order of Presentation Time)

Priscilla Wolfe
Brent Thomas
Zhiwei Cai
Daniel Blackwell, Jeremy
Lauren-Steinbrenner, Robert Wells,
and Gabriel Clarke

On Thin Ice: The “Khrushchev Thaw” and Literary Liberalization

Priscilla Wolfe
History Department, Austin College
Abstract #51

On Thin Ice: The “Khrushchev Thaw” and Literary Liberalization uses a sample of Soviet short and long fiction stories to measure the changing severity of state censorship from 1947-1956, examining the amount of overt and covert political criticism that was present before and after Joseph Stalin’s death in order to determine if there was significant literary liberalization within the Soviet Union under Nikita Khrushchev. Through the in-depth analysis of several stories according to a specific and consistent checklist, this research paper shows that de-Stalinization policies of Khrushchev had had a measurable impact on empowering Soviet authors, enabling direct critique against party leadership, policy, and administration through the themes and characters within their stories, although this literary liberalization did not extend beyond 1957 as more severe censorship policies were implemented.

Faculty Director: Hunt Tooley

With Unflinching and Scrupulous Regard: American Military Atrocities in the Philippines and the Roles of Presidents McKinley and Theodore Roosevelt

Brent Thomas
History Department, Austin College
Abstract #52

This paper examines some of the actions of the United States military in the Filipino-American War during the period from late 1898 until the summer of 1902. Included in these actions were certain atrocities committed against Filipino civilians. The record shows that these acts were committed by American troops with the full knowledge of not only senior field commanders, but also high ranking members of the two American presidential administrations then in office. My intent is to not only chronicle the events themselves, but also the changing social and economic conditions in the United States which may have contributed to the toleration of these atrocities. Finally, the attitudes, actions, and inactions of both President William McKinley and President Theodore Roosevelt, in their constitutionally mandated roles as commanders-in-chief of the armed forces of the United States, are scrutinized in an attempt to determine their propriety given the circumstances. The Filipino-American War was a war waged by conventional military forces of the United States against Filipino insurgents using non-conventional, or guerilla tactics. It was not unlike many of the conflicts with which the United States has found itself involved in recent years. Lessons learned in the Philippines can be instructive in formulating United States military policy especially in terms of command and control and control of field commanders by civilian authority.

Faculty Director: Hunt Tooley

The Effect of FDI and Local Business on Economic Growth and Environmental Issues

Zhiwei Cai

Economics and Business Administration Department,

Austin College

Abstract #53

This paper's primary contribution is to further the understanding of the influence of the FDI and Local Business on GDP and environmental issues (CO₂ emission and other greenhouse gas emission). We analyzed the economic and environmental data of 133 countries from the World Bank, covering three regions, from less developed countries to developed countries. In the research, we found that GDP is positively related to environmental pollution and FDI. The associations between FDI and pollution gas emissions are divergent by region. No correlations between local new business density and either GDP or pollution emissions are found.

Faculty Director: David Griffith

GPS: Directions to the Future

Daniel Blackwell, Jeremy Lauren-Steinbrenner, Robert Wells,
and Gabriel Clarke
Economics and Business Administration Department,
Austin College
Abstract #54

Our project is an analysis of current GPS and driving conditions in Texas and how we might use current infrastructure to improve the functions of GPS devices and programs. These improvements would greatly increase our State's ability to move traffic easily in a way that would remain useful and relevant far into the future without significant monetary investment.

Faculty Director: David Griffith

Quilt Making, American Literature, and Intertextuality

Moderator: Randi Tanglen
Block III: 1:45 p.m. - 3:00 p.m.
Wright Campus Center 255

“Intertextuality” is a term used to theorize the ways in which texts exist in cultural, literary, and aesthetic contexts alongside each other. Students in Randi Tanglen’s fall 2013 “English 250: Visions and Revisions of 19th-Century American Literature” set out to explore the intertextual relationships among three classic 19th-century American novels and their present-day re-tellings by contemporary authors. Drawing upon the African American tradition of quilt making portrayed in the 2006 novel *My Jim* by Nancy Rawles, the students created a quilt that represented the intertextual connections among all six novels. The six papers on the panel will describe the process of making and designing the quilt in collaboration with local quilt artist Becky Goldsmith; analyze how quilt making enhanced the skill of close reading and opened interpretive possibilities; and reflect upon the ways in which making a quilt can be an intellectual project.

Student Presenters:

Amber Eustace
Carla Garcia
Luci Gonzales
Sathya Kikkeri
Alex Opper
Sasha Tatum

Presentations from the Art Department

Moderator: Mark Monroe
Block III: 1:45 p.m. – 3:00 p.m.
Ida Green Gallery

Individual Artists

Sam Gamble
Sarah Martin
Lauren Bolinger
Elsih Escoto

Group Project Participants

Jordan Baugher
Celeste Burnett
Abdelaziz De Vol
Kate Alice Hamilton
Amy Harvey
Krista Jarrell
Jordan Jones
Alexis Larmeu
Samuel Spillyards
Colton Turbeville
Mengfei Yu

Queer Bodies

Sam Gamble
Art Department, Austin College
Abstract #55

My summer research fellowship focused on affect theory, ideas of passing, and queer theory. I have been working to use the themes presented in the books and articles I read over the summer and incorporate them into photographic pieces of art. I am interested in the ways that art can convey difficult and complex ideas in ways that are beautiful and easier to understand than a paper might be.

I am still producing more images which will focus more heavily on the body rather than on the ephemeral birds, though they will not be totally absent from the newer work. These images are representative of ideas of the body, societal impacts on our perception, and question how deeply these ideas penetrate us.

Faculty Director: Todd Penner

Collection of Responses

Sarah Martin
Art Department, Austin College
Abstract #56

These five paintings are all works in acrylic that I have completed while studying Art at Austin College.

The paintings were all created throughout the changing of the seasons. Each painting is a response to the changes in the natural environment.

Faculty Director: Mark Smith

Chrysalis

Lauren Bolinger
Art Department, Austin College
Abstract #57

This interdisciplinary piece uses materials discarded from Moody Science as it approaches renovation. The repurposed materials include a specimen box and images from a field guide to North American butterfly identification. This piece is meant to be shown pinned to a wall from the corners of a web holding the pieces together similar to the way a butterfly specimen would be pinned in the box containing it. When not pinned on the wall, this piece collapses and folds to be placed into its own specimen box. The process of removing “Chrysalis” from its holding cell and pinning it to the wall is just as symbolic as the piece itself. Graduating students, no matter their field of study, deal with a lot of fear while on the verge of exiting one phase entering another, primarily that we will only feel free for a moment to go our own course when we enter the “real world!” only to be almost immediately pinned down by something else. The melodramatic expressions and autobiographical ranting sketched in ink obscure the images of butterflies just as fear often clouds our ambition. While “Chrysalis” seems to emphasize the bondage of fear and anxiety, the potential that exists within it is the main theme of this piece. I would like to encourage facing and exploring our fears as a means of eventually overcoming them.

Faculty Director: Mark Monroe

Raku Tablescape

Jordan Baugher, Celeste Burnett, Abdelaziz De Vol, Kate
Alice Hamilton, Amy Harvey, Krista Jarrell,
Jordan Jones, Alexis Larmeu, Samuel Spillyards,
Colton Turbeville, and Mengfei Yu
Art Department, Austin College
Abstract #58

The artwork *Raku Tablescape* was created by the introductory ceramics class taught by Mark Monroe in the fall of 2013. The piece was designed for an event that benefited the downtown Sherman charity group *Women's Gift Exchange*. The "Fall Into Christmas" tablescapes fundraising event was held November 9 in Kelly Square. Designers from across Texoma decorated tables that would represent their specific business. Flower shops, interior design shops, and photographers were just a few of the Sherman businesses involved. Mark Monroe was asked to represent the arts at Austin College and he thought that this would be a perfect opportunity for the ceramics class to create a tablescape that was essentially topographic artwork: a table that would also read as a landscape.

The initial framework for this assignment called on each person to create and design one section of the table. Students worked to manufacture and then sculpt one section. The table was disassembled and then fired in an initial firing. Next, all of these sections were glazed fired with a process know as Raku. The tabletop was then assembled for the first time at the "Fall Into Christmas" event. The resulting artwork is the product of this group working together on a project that would expand each student's idea of what is possible to create with clay. Introductory art students sometimes have a myopic approach to making art and this project necessitated that they work together toward a collective objective. This teamwork resulted in an elevation of each artist's creative vision.

Faculty Director: Mark Monroe

ACUMEN

Call for Papers

ACUMEN is Austin College's student-run journal of research. Are you involved in a research project on campus? Have you written a paper for class you are particularly proud of? Submit your paper for publication! All subjects welcome.

How to Submit

Send your research paper (with bibliography) as .doc or .rtf to **acumen@austincollege.edu**

Submission Guidelines

- Submissions should be approximately 7-20 pages in length.
- Submissions may be the products of individual or class research, directed or independent studies. Please do not submit work that is up for publication elsewhere, such as honors theses or research done in collaboration with AC faculty.
- Students should consider their audience to be generally educated and well read. However, the emphasis on interdisciplinary exchange of ideas requires that technical terminology from any field be generally explained for this audience.
- Submissions may be selected for publication on a conditional basis, provided the student makes the necessary revisions.
- All papers must follow college guidelines for academic integrity.

For more information, or if you are interested in participating in Acumen as a member of the review board, please email the editor at **acumen@austincollege.edu**

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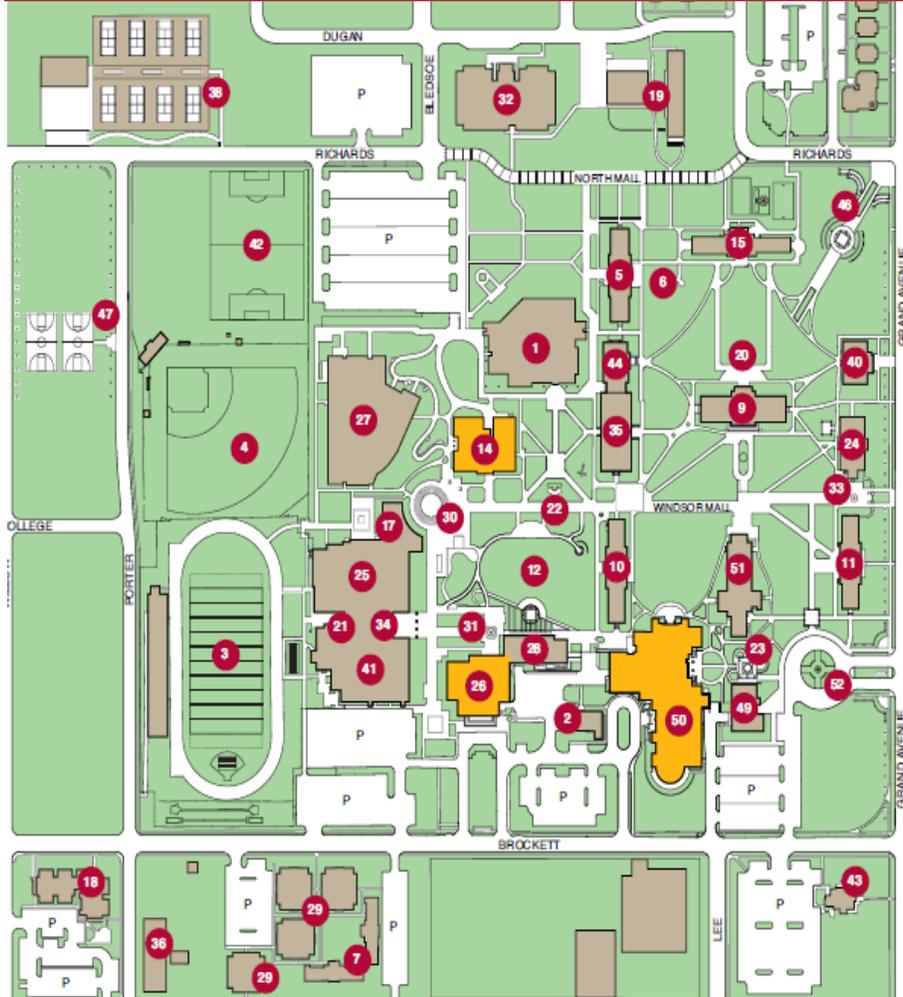


Acumen (Student Research Journal)



Suspension Literary Journal

Austin College Map - Student Scholarship Conference Locations



MAP KEY

- | | | | |
|-------------------------------------|---|---|---|
| 1. Abell Library Center | 14. Craig Hall for Music | 28. Jackson Technology Center | 41. Sid Richardson Recreation Center |
| 2. Adams Center | 15. Dean Residence Hall | 29. Johnson 'Roo Suites | 42. Soccer Field |
| 3. Apple Stadium | 16. Detweiler House | 30. Jonsson Fountain | 43. Temple Center for Teaching and Learning at Thompson House |
| 4. Baker Athletic Field | 17. Dickey Fitness Pavilion | 31. Jonsson Plaza | 44. Thompson Hall (Sciences) |
| 5. Baker Residence Hall for Men | 18. The Flats at Brockett Court | 32. Jordan Family Language House | 45. The Village on Grand |
| 6. Elia Barker Memorial Garden | 19. Forster Art Studio Complex | 33. Kappa Fountain | 46. Williams Founders Plaza |
| 7. Bryan Apartments | 20. Hall Graduation Court | 34. Mason Athletic-Recreation Complex | 47. Williams Intramural Complex |
| 8. Carruth Guest House | 21. Hannah Natatorium | 35. Moody Science Center | 48. Windsor House |
| 9. Caruth Administration Building | 22. Hersh Memorial Garden | 36. Physical Plant Building | 49. Wortham Center |
| 10. Caruth Residence Hall for Women | 23. Honors Court and Collins Fountain | 37. President's House | 50. Wright Campus Center |
| 11. Clyce Residence Hall | 24. Hopkins Social Science Center | 38. Russell Tennis Center | 51. Wynne Chapel |
| 12. College Green | 25. Hughey Gymnasium | 39. Settles House | 52. Zauk Circle Drive and Garden |
| 13. Collins Alumni Center | 26. Ida Green Communication Center | 40. Sherman Hall (Humanities) and Hoxie Thompson Auditorium | P = Parking |
| | 27. IDEA Center | | |