<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00 a.m. - 2:00 p.m.</td>
<td>Registration Open</td>
<td>South Ballroom</td>
</tr>
<tr>
<td>8:00 a.m. - 9:20 a.m.</td>
<td>Breakfast</td>
<td>Red Raider Lounge</td>
</tr>
<tr>
<td>8:00 a.m. - 9:20 a.m.</td>
<td>Day 1 Poster Set-Up</td>
<td>North Ballroom</td>
</tr>
<tr>
<td>9:30 a.m. - 9:50 a.m.</td>
<td>Conference Welcome</td>
<td>South Ballroom</td>
</tr>
<tr>
<td>10:00 a.m. - 11:30 a.m.</td>
<td>Poster Session #1</td>
<td>North Ballroom</td>
</tr>
<tr>
<td>10:00 a.m. - 4:00 p.m.</td>
<td>Visual Art Exhibition</td>
<td>South Ballroom</td>
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<tr>
<td>11:00 a.m. - 12:30 p.m.</td>
<td>Come-and-Go Lunch</td>
<td>Red Raider Lounge</td>
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<tr>
<td>12:40 p.m. - 1:50 p.m.</td>
<td><em>Plenary Session:</em> Dr. Ali Nejat<em>Communicating Research to a Broader Audience</em></td>
<td>Traditions Room</td>
</tr>
<tr>
<td>2:00 p.m. - 3:40 p.m.</td>
<td>Oral/Paper Session #1</td>
<td>Various 2nd Floor Rooms</td>
</tr>
<tr>
<td>3:00 p.m. - 4:00 p.m.</td>
<td>Poster Take-Down</td>
<td>North Ballroom</td>
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<tr>
<td>4:00 p.m. - 6:00 p.m.</td>
<td>Performing Arts Session</td>
<td>Escondido Theater</td>
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**WEDNESDAY, MARCH 30, 2016**

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<tbody>
<tr>
<td>8:00 a.m. - 11:00 a.m.</td>
<td>Registration open</td>
<td>South Ballroom</td>
</tr>
<tr>
<td>8:00 a.m. - 9:00 a.m.</td>
<td>Breakfast</td>
<td>Red Raider Lounge</td>
</tr>
<tr>
<td>8:00 a.m. - 11:00 a.m.</td>
<td>Day 2 Poster Set-Up</td>
<td>North Ballroom</td>
</tr>
<tr>
<td>9:00 a.m. - 3:00 p.m.</td>
<td>Visual Art Exhibition</td>
<td>South Ballroom</td>
</tr>
<tr>
<td>9:30 a.m. - 11:10 a.m.</td>
<td>Oral/Paper Session #2</td>
<td>Various 2nd Floor Rooms</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>Luncheon Invited Only Panel</td>
<td>Matador Room</td>
</tr>
<tr>
<td>1:30 p.m. - 3:00 p.m.</td>
<td>Poster Session #2</td>
<td>North Ballroom</td>
</tr>
<tr>
<td>3:00 p.m. - 4:00 p.m.</td>
<td>Poster &amp; Visual Art Take-Down</td>
<td>Ballroom</td>
</tr>
</tbody>
</table>

**THURSDAY, MARCH 31, 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>6:30 p.m. - 8:30 p.m.</td>
<td>TTU Undergraduate Research Banquet Dr. Katharine Hayhoe <em>Researching Bigger</em> (Doors open at 6:00 p.m. for ticket holders. Non-ticket holders admitted at 6:30 p.m.)</td>
<td>Ballroom</td>
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Welcome Conference Attendees:

Thank you for joining us for the 8th Annual Texas Tech University Undergraduate Research Conference (TTU URC). The TTU URC is one of the largest undergraduate research conferences in Texas. With TTU’s recent designation as a Carnegie Tier One university, we are especially pleased to showcase the outstanding undergraduate research of our students to faculty, staff, fellow students, and the local community. This year we have over 200 student presenters representing a broad range of fields including the humanities, performing arts, biological and chemical sciences, social sciences, and physical sciences. Moreover, we are welcoming more than 100 registered reviewers and visiting student presenters representing seven colleges and universities.

The 2016 Undergraduate Research Conference will offer a variety of activities including poster and oral presentations, networking opportunities, artistic performances, exhibits, and a plenary session entitled, “Communicating Your Research to a Broader Audience.” We are thrilled to cap off this year’s conference with a keynote address by Dr. Katharine Hayhoe, associate professor in the Department of Political Science and director of the TTU Climate Science Center. Dr. Hayhoe’s many accolades and achievements include selection as one of Time’s “100 Most Influential People of 2014,” The Huffington Post’s “Top 10 Environmental Leaders,” and a contributor and expert reviewer for the 2007 Nobel Peace Prize winning Intergovernmental Panel on Climate Change.

Thank you for attending the 2016 Texas Tech University Undergraduate Research Conference.

Sincerely,

PATRICK C. HUGHES, PH.D.
Associate Professor & Associate Vice Provost, Undergraduate Education
Welcome from the Center for Active Learning and Undergraduate Engagement:

The Center for Active Learning and Undergraduate Engagement (CALUE) is committed to the discovery and advancement of knowledge, creating intellectual and personal development, and stimulating and inspiring meaningful research and service for both faculty and students. The Center provides direction and support for undergraduate students interested in conducting research with a faculty mentor; hosts workshops for students targeted at organizing, conducting, and presenting research; and creates collaborations and dialogues to support faculty, staff, and organizations engaged in undergraduate research initiatives.

CALUE also provides financial support for undergraduate research through student travel and project funding. During the 2015 – 2016 academic year, CALUE provided over $35,000 in travel funding to more than 50 undergraduate researchers presenting research at regional, national, and international conferences and over $23,000 to fund 26 undergraduate students’ work on TTU research projects. Four additional undergraduate researchers’ projects were funded through a $2500 partnership with TTU Parent and Family Relations.

Each year, with the generous backing of its campus sponsors, CALUE hosts its flagship undergraduate research event, the Texas Tech University Undergraduate Research Conference (URC). CALUE prides itself in supporting a number of the undergraduate researchers whose work you will have an opportunity to see presented during the week.

CALUE looks forward to concluding the 2016 URC by awarding the 2016 Dr. Sarah Kulkofsky Scholarship, recognizing outstanding undergraduate researchers, and honoring exceptional faculty mentors during the annual TTU Undergraduate Research Spring Banquet on March 31. Thank you for joining us during this campus wide celebration. We hope you enjoy all of the conference activities hosted this week.

Sincerely,

Center for Active Learning & Undergraduate Engagement Team
The Center for Active Learning and Undergraduate Engagement (CALUE) would like to recognize Texas Tech University for its support of undergraduate research. Additionally, we would like to extend our appreciation to the following partners for their support of the Undergraduate Research Conference (URC). A special thanks to the following:

- The Office of the President, Office of the Provost, and the Office of the Vice President for Research; the CALUE Advisory Committee; and our URC presenters, performers, faculty mentors, session speakers, moderators, and reviewers.

**Create Level Sponsor**
- Center for the Integration of STEM Education and Research (CISER)
- University Student Housing

**Discover Level Sponsor**
- Teaching, Learning, and Professional Development Center (TLPDC)
- TTU Graduate School
- TTU Honors College

**Campus and Community Partners:**
- Animal and Food Sciences
- Division of Undergraduate Education and Student Affairs
- TTU College of Education
- School of Art
- School of Music
- School of Theatre and Dance
- STEM Center for Outreach Research and Education
- Student Union & Activities
- Women’s Studies Program
Communicating Your Research to a Broader Audience
March 29, 2016
12:40 p.m. – 1:50 p.m.
Student Union Building: Traditions Room
(Plenary Speaker)

Synopsis:
The ability to communicate one’s research to a broad range of audiences is an essential skill for both novice and expert researchers – a skill on which potential funding, legislative support, and perceived level of impact depend. Dr. Ali Nejat will discuss strategies and approaches researchers can employ when presenting their research to various types of audiences.

Ali Nejat, PhD:
Dr. Nejat is an Assistant Professor in the Department of Construction Engineering and Engineering Technology. Prior to his appointment at Texas Tech University, he was involved in a variety of research projects in infrastructure management. These research studies have led to several publications in nationally accredited journals and reports, such as Transportation Research Record, National Cooperative Highway Research Program (NCHRP), Strategic Highway Research Program 2 (SHRP 2), Texas Transportation Institute, Texas Department of Transportation, and Construction Industry Institute.

Dr. Nejat’s research interests include:
• Modeling dynamics of post-disaster recovery
• Multiagent systems
• Agent-based modeling
• System dynamics
• Transportation construction management
CISER Honorary Lifetime Scholar Panel Discussion and Luncheon
March 30, 2016
11:30 a.m. – 1:00 p.m.
Student Union Building: Matador Room
(Invitation Only – RSVP Required)

Synopsis:
Enjoy lunch and inspirational discussion with seven Texas Tech University alumni who have found success in various STEM fields. Take the opportunity to hear, first account, how being Red Raiders has effectuated lasting changes within the panelists’ lives and led to successful professional careers.

Visiting Honorary Lifetime Scholars:
James M. Burkhead, MD, Obstetrics and Gynecology
Gary Fish, MD, JD, MBA, LLM MD, Ophthalmology
Edward A. Graviss, PhD, MPH, Epidemiology
Daragh Heitzman, MD, Neurology
Randy Macurak, MD, Gastroenterology
Jay Vollet, PhD, Immunology and Pharmaceuticals
Michael Whetstone, MD, Plastic Surgery

Sponsored in part by:
CISER: Center for the Integration of STEM Education & Research
2016 TTU Undergraduate Research Banquet
March 31, 2016
6:30 p.m. – 8:30 p.m.
Student Union Building: Ballroom
(Invitation Only – RSVP Required)

Synopsis:
The extensive impact of Dr. Hayhoe’s research across the globe is undeniably inspirational for the burgeoning scholars of this generation. Join us as Dr. Hayhoe shares her advice on “Researching Bigger” and keeping a broad perspective on both the approach and reach of one’s research.

Katharine Hayhoe, PhD:
Katharine Hayhoe is an accomplished climate scientist, with over 100 peer-reviewed publications in the top journals in the field. She is also a remarkable communicator. In 2014, she was recognized by Time Magazine as one of the top 100 most influential people in the world, by Foreign Policy as one of the top 100 global thinkers, and won the American Geophysical Union’s award for climate communication. She’s served on the panels for the National Academy of Science, the American Association for the Advancement of Science, and many other professional organizations devoted to understanding and communicating climate change.

As a world-class climate scientist and a Christian, Dr. Katharine Hayhoe may defy some stereotypes about the politics of religion and science. But defying stereotypes invites inquiry, which can lead to communication, even learning. It creates opportunity for thinking deeply about, and aligning, what we value and what we do. Climate change is a huge issue, and it’s one where citizen engagement is critical. That’s why her work is so fascinating: in part because it’s about climate change, and also because her main theme – faith and science – defies stereotypes.
CISER Scholars
Katherine Crocco
Mai Dinh
Paul Duggan
Rachel Dziuk
Cody Fell
Aicha Fokar
Jorge Franco
Holden Fried
Stacy Galvan
Amanda Lund
Marilyn Mathew
Nitish Mittal
Nicholas Muirhead
Maria Nunez-Tabares
Paden Ortega
Christopher Ponce
Gage Rowden
Helen Scott
Jake Smith
Adam Tsen
John Usala
Hector Valencia
Marisa Elise Wagley
Brooke Walterscheid
Whitney Watson
Maksym Zhelyeznyakov
Robert Campbell

Afﬁliated Programs
AFFILIATED PROGRAMS

Alicia Wafa
Marisa Elise Wagley
Brooke Walterscheid
Jennifer Webster
Gabrielle White
Jordyn Willis

Mentor Tech
Asher George
Ashlie Gomez-Pilcher
Cierra Griffin
Brooke Harris
Loren Hensley
Smith Melinda
Sami Moussa
Christopher Ponce
Elizabeth Stelly
Hector Valencia
Marisa Elise Wagley

PRISM
Caroline Claassen
Boone Coleman
Adam Harper
Farah Mechref
Grace Meehan
Brady Mikeska
Casey Mills
Dhruv Patel
Zachary Tatum

SACNAS
Loren Hensley
Marilyn Mathew
Maria Nunez-Tabares
Christopher Ponce
Mychael Solis-Wheeler
Hector Valencia

2015 SKS Recipient
Nadeem Dabbakeh

SOWER
Edytha Alfaro
Yomer Cisneros
Jorge Chevarria
Jorge Estevez
Erasmo Flores
Wilber Gutierrez
Roberto Miranda-Gomez
Diana Fabiola Orellana
Axel Poou
Mateo Toro

CISER = Center for the Integration of STEM Education & Research
Honors URS = Honors College Undergraduate Research Scholar
PRISM = Proactive Recruitment in Introductory Science and Mathematics
SACNAS = Society for Advancement of Chicanos and Native Americans in Science
SKS = Dr. Sarah Kulkofsky Scholarship
SOWER = Sustaining Our World through Education and Research
1. FUNCTIONAL SPORTS WEAR DESIGN USING 3D OPTITEX
   Moloney, Briana □

2. INTERTWINING ARTISTRY AND ADVANCEMENT: CASE STUDIES OF FEMALE LEADERS IN THE DANCE FIELD
   Pelham, Allison □

**Biological and Chemical Sciences**

3. DNASE1L3 TRAFFICKING IS REDIRECTED FROM SECRETION TO THE NUCLEUS IN LUPUS-PRONE MICE
   Abbott, Kennady □

4. OBESITY-BREAST CANCER INTERACTIONS: EFFECTS OF ADIPOCYTES ON BREAST CANCER CELLS AND PREVENTIVE EFFECTS OF OMEGA 3 FATTY ACIDS.
   Alhaj, Sara □

5. DELTA-TOCOTRIENOL DOSE-DEPENDENTLY DECREASED ADIPOSITY AND INFLAMMATION AND INCREASED MARKERS OF LIPID OXIDATION IN HIGH FAT FED MICE
   Allen, London □

6. THE EFFECT OF VITAMIN B12, BIOTIN, AND THIAMINE ON PRYMNESIUM PARVUM CULTURE GROWTH
   Andersen, Ryley □

7. SEASONAL PHENOLOGY OF A JERUSALEM CRICKET (STENOPELMATUS MONAHANSENSIS) FROM THE MONAHANS SAND DUNES SYSTEM IN WESTERN TEXAS
   Bennett, Tyler □

8. APPLYING DIGITAL HOLOGRAPHY MICROSCOPY (DHM) TO LABEL-FREE DETECTION OF CTCS
   Berry, Jacqueline □

9. TUMOR CELL HYPOXIA AND OXYGEN CONSUMPTION IN A MICROFLUIDIC DEVICE
   Bond, Elise □

10. NOVEL LACTIC ACID BACTERIA (L14 AND L28) AS A BIOCONTROL AGENT FOR INHIBITION OF SALMONELLA IN A RAW CHICKEN FAT USED AS A DOG FOOD INGREDIENT.
    Castillo, Adam □

11. SERUM INFLUENCES PSEUDOMONAS AERUGINOSA VIRULENCE BY ALTERING THE PRODUCTION OF OUTER MEMBRANE PROTEINS
    Chehadi, Max □

12. USE OF BACTERIOPHAGES TO TREAT MRSA INFECTION
    Chu, Bryan □

13. SURFACE-WATER DYNAMICS OF SALT PLAYAS IN TEXAS OVER A 27-YEAR SPAN
    Claassen, Caroline □

14. DEVELOPMENT AND VALIDATION OF A PLUS MAZE ANXIETY TEST IN AFRICAN CLAWED FROGS (XENOPUS LAEVIS)
    Coleman, Boone □

15. EFFECTS OF OMEGA 3 FATTY ACIDS ON INFLAMMATION IN C. ELEGANS
    Coleman, Elise □

16. SPECIES SPECIFIC VIRAL DNA INSERTION OF HEPATITIS B IN OSTEOLAEMUS TETRASPIS
    Crocco, Katherine *

17. THE RELATIONSHIP BETWEEN SEDENTARY TIME AND CONDITIONED PAIN MODULATION AMONG YOUNG HEALTHY ADULTS
    Cross, Austin □

18. EFFECTS OF GUAR GUM ON INFLAMMATION IN ADIPOCYTES
    Dameron, Elizabeth □

19. UPTAKE AND TRANSLOCATION OF CARBON NANOTUBES OF VARIOUS SIZE AND FUNCTIONALITY IN CARROTS
    Deleon, Sabrina *

20. ROLE OF THE ENDOPLEASMIC RETICULUM IN ANGIOTENSIN-INDUCED ADIPOSE TISSUE INFLAMMATION
    Dinh, Tram □

21. PATTERNS OF GENETIC DIVERSIFICATION IN A WIDELY DISTRIBUTED SPECIES OF BAT, MOLOSSUS MOLOSSUS, BASED ON A NUCLER MARKER
    Donckels, Kelsey □

22. PREYOR PRESENCE DECREASES FOOD CONSUMPTION IN JUVENILE XENOPUS LAEVIS
    Duggan, Paul *

23. MATURE SERTOLI CELLS TRANSIENTLY REINITIATE PROLIFERATION AFTER SYNGENIC AND ALLOGENIC TRANSPLANTATION
    Dziuk, Rachel *

24. MICROBIAL PRESENCE OF SALMONELLA AND ESCHERICHIA COLI O157 FOUND IN SMALL-RUMINANT FECAL SAMPLES FROM THE BAHAMAS
    Echevarria, Jorge □

25. A HIGH-THROUGHPUT, MICROFLUIDIC PLATFORM FOR THE STUDY OF LIFESPAN EXTENSION BY DIETARY RESTRICTION IN C. ELEGANS.
    Edwards, Hunter □

26. AROUSAL DURATION EFFECTS ON HIBERNATING BATS
    Esparza, Aaron □

27. LIPID PROFILE AND PROXIMATE ANALYSIS OF FREE RANGE AND COMMERCIALLY-RAISED BROILERS AVAILABLE IN RETAIL OUTLETS IN LUBBOCK, TEXAS.
    Estevez, Jorge □

28. INVESTIGATING THE ROLE OF MRSA IN NECROTIZING SOFT TISSUE INFECTIONS
    Fell, Cody *

29. CONSUMER ASSESSMENT OF DOMESTIC LAMB LOINS FROM 3 MARBLING LEVELS AGED 21 OR 42 D.
    Flores, Erasmoc：□

30. MALDI-TOF AS A NEW TOOL FOR QUANTIFICATION OF POLYAMINES IN PLANTS
    Fokar, Aicha *

31. COMPARISON OF COMMERCIALLY AVAILABLE AND NOVEL LACTIC ACID BACTERIA (L28, FS56) AS BIO-SANITIZERS TO INHIBIT LISTERIA MONOCYTOGENES ON STAINLESS STEEL SURFACES.
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    Fried, Holden *

33. CHOLESTEROL-BINDING DOMAINS FROM PORE-FORMING TOXINS LIMIT STREPTOLYSIN LETHALITY
    Gallegos, Shawna □

□ = Tuesday Presentation: 10:00 a.m. – 11:30 a.m. | North Ballroom
* = Wednesday Presentation: 1:30 p.m. – 3:00 p.m. | North Ballroom
34. EFFECTIVENESS OF NI-07 AS AN ANTI-TUM OR AGENT ON CANINE OSTEOSARCOMA CELLS
   Galvan, Stacy *
35. THE USE OF A STAPHYLOCOCCUS AUREUS PHAGE COCKTAIL TO TREAT MRSA WOUNDS IN DIABETIC MICE
   George, Asher ☑
36. LONG-TERM EFFECTS OF EARLY-LIFE EXPOSURE TO OLANZAPINE
   George, Brianna ☑
37. ROLE OF OLFATORY CUES IN PREY CAPTURE BEHAVIOR OF THE AFRICAN CLAWED FROG, XENOPUS LAEVIS.
   Gomez-Pilcher, Ashlie ☑
38. ESTABLISHING TYPE II DIABETES MOUSE MODEL
   Greer, Hannah ☑
39. THE INFLUENCE OF ETHNICITY AND GENDER ON CONDITIONED PAIN MODULATION AMONG YOUNG HEALTHY AFRICAN AMERICANS AND NON-HISPANIC WHITES
   Griffin, Cierra ☑
40. AN ANNOTATED CHECKLIST AND CATALOGUE OF THE NATIVE BEE SPECIES OCCURRING ON THE SOUTHERN HIGH PLAINS IN WESTERN TEXAS
   Gutierrez, Wilber ☑
41. DIASTOLIC FUNCTION IN RELATION TO REGIONAL ADIPOSITY IN WOMEN
   Hadri, Omar ☑
42. MODEL OF DIAGNOSTIC DIAPER WITH ACID-BASE VIRAL INDICATOR
   Harris, Jennifer ☑
43. VIABLE ANTIBIOTIC RESISTANT BACTERIA ARE DISSEMINATED ON AIRBORNE PARTICULATE MATTER FROM CATTLE FEED YARDS
   Hensley, Loren ☑
44. THE ROLE OF PHYSICAL ACTIVITY IN THE RELATIONSHIP BETWEEN AGE AND PAIN CONDITIONS: AN INNOVATIVE HYPOTHESIS FROM A LITERATURE REVIEW.
   Heredia, Carla ☑
45. SENSITIVITY OF COMMON VASTUS LATERALIS ULTRASOUND VARIABLES FOR EXAMINING AGE-RELATED DIFFERENCES
   Hernandez, Jennah ☑
46. SORGHUM SILAGE: A VIABLE ALTERNATIVE TO CORN SILAGE?
   Hoffman, Amanda ☑
47. THE EFFECTS AND PATHWAY OF TIGECYCLINE IN REDUCING ETHANOL CONSUMPTION
   Holmes, Ashley ☑
48. CHANGES IN BODY COMPOSITION AFTER EXERCISE IN HEALTHY AND OBESE FEMALES: PRELIMINARY DATA
   Hull, Amara ☑
49. INFLUENCE OF PHYSICAL FITNESS LEVELS IN CIRCULATING IRISIN
   Hurtado, Amy ☑
50. EXERCISE BEFORE AND DURING PREGNANCY DOES NOT ALTER MYOSIN HEAVY CHAIN ISOFORMS IN PREGNANT MICE
   Jacobo, Unique ☑
51. POOR PHYSICAL ACTIVITY LEVELS AND PHYSICAL FITNESS IN ADOLESCENTS WITH ANOREXIA AFTER HOSPITALIZATION
   Jeffery, David ☑
52. INVESTIGATING DUAL-SPECIES INTERACTIONS IN AN IN VITRO WOUND ENVIRONMENT
   Johnson, Justin ☑
53. MATERNAL Exercise ACTIVATES GENES ASSOCIATED WITH MITOCHONDRIAL BIOGENESIS IN FETAL MYOCARDIUM OF MOUSE
   Joiner, Hayli ☑
54. WEED MANAGEMENT WITH ENGENIA IN BOLLGARD II XTENDFLEX COTTON
   Keeling, Emily ☑
55. THE EFFECTS OF ZINC SUPPLEMENTATION ON FEEDLOT PERFORMANCE, CARCASS CHARACTERISTICS, AND BLOOD METABOLITES OF FINISHING STEERS
   Kennedy, Kieg ☑
56. IDENTIFYING VESICULAR GLUTAMATE TRANSPORTERS IN THE BRAIN OF THE AFRICAN CLAWED FROG XENOPUS LAEVIS
   Le, Christopher ☑
57. PRELIMINARY TRIALS OF A NEW HUMAN SEMEN THAWING DEVICE
   Littleton, Katelyn ☑
58. THE USE OF PIGMENT EPITHELIUM- DERIVED FACTOR (PEDF) TO ANALYZE ANDROGEN RECEPTOR RESPONSE IN PROSTATE CANCER CELLS
   Loy, Sydney ☑
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   Luna, Isabella ☑
60. BETADINE SOLUTION IS NOT EFFECTIVE IN INHIBITING THE GROWTH OF DIFFERENT GRAM POSITIVE AND GRAM NEGATIVE PATHOGENS IN VITRO
   Luth, Keaton ☑
61. PEDF MODULATORY ACTION ON MACROPHAGES: A NEW WAY TO CURB PROSTATE CANCER
   Martinez-Marin, Dalia *
62. PHYLOGENY OF BATS OF GENUS MONOPHYLLUS. A STUDY OF GENETIC AND MORPHOLOGICAL DIVERGENCE BASED ON MITOCHONDRIAL CYTOCHROME-B GENE.
   Mathew, Marilyn *
63. INITIAL ANALYSES OF LACTOBACILLI OBTAINED FROM PATIENTS WITH VAGINAL LACTOBACILLOSIS.
   Maveddat, Ashley *
64. FORMULATION OF A NOVEL MEDIUM TO EXAMINE THE EFFECT OF PHYSIOLOGICAL LEVELS OF BLOOD IONS ON THE VIRULENCE OF PSEUDOMONAS AERUGINOSA
   Mechref, Farah; Dhruv, Patel ☑
65. NEXT-SCIENCE WOUND GEL ALTERS THE EXPRESSION OF WOUND RELATED CYTOKINES
   Meehan, Grace *
66. GERMINATION RESPONSE OF FOUR TEXAS NATIVE SPECIES TO SMOKE EXPOSURE
   Mikeska, Brady *
67. REDUCTIVE SONOCHEMICAL SYNTHESIS OF SUPERPARAMAGNETIC NANOATERIALS
   Miller, Amanda *
68. HABITAT ASSOCIATIONS OF A JERUSALEM CRICKET (STENOPELMA CUS MONAHANSENSIS) AT THE MONAHANS SAND DUNES IN WESTERN TEXAS
   Miranda-Gomez, Roberto *

Θ = Tuesday Presentation: 10:00 a.m. – 11:30 a.m. | North Ballroom
* = Wednesday Presentation: 1:30 p.m. – 3:00 p.m. | North Ballroom
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70. DEVELOPMENT OF A CRYOPRESERVATION TECHNIQUE FOR SPERMATOZOA OF NON-TRADITIONAL SPECIES
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71. COST-EFFECTIVE STRATEGY FOR LARGE SCALE PREPARATION OF SR-B1 ANTIBODY
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72. UNDERSTANDING SPECIES LIMITS OF PEROMYSCUS MEXICANUS GROUP USING A GENETIC APPROACH
Nunez-Tabares, Maria *

73. MATHEMATICAL MODEL FOR TIME TO NEURONAL APOPTOSIS DUE TO ACCRUAL OF DNA DSBS
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74. ANTIMICROBIAL RESISTANCE OF SALMONELLA ENTERICA ISOLATES RECOVERED BEEF CATTLE FROM MEXICO.
Orellana, Diana Fabiola *

75. PREVALENCE OF ANTIBIOTIC RESISTANT AND SUSCEPTIBLE CAMPYLOBACTER IN RETAIL GROUND BEEF
Ortega, Paden *

76. THE EXPLOITATION OF ALTERNATIVE AROMATASE PROMOTERS BY ER+ BREAST CANCER
Pace, Annelise *

77. SYNTHESIS OF BISMUTH-BASED PHOTOCATALYSTS VIA SOL-GEL CHEMISTRY
Pacheco, Belinda *

78. VITAMIN D INCREASES CHOLESTEROL EFFLUX AND APOPTOSIS IN BREAST CANCER
Ponce, Christopher *

79. HONDURAN FED CATTLE DIETS AND THEIR RESULTING EFFECT ON LIVE WEIGHT AND RIBEYE AREA
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80. INFLUENCE OF pH ON YEAST CELL SIZE AND AGING: IT’S PRETTY BASIC
Rajan, Arsheen *

81. MYCN AND MYC EXPRESSION PROFILE IN ETOPOSIDE SENSITIVE AND RESISTANT NEUROBLASTOMA CELL LINES
Rodriguez, Brian *

82. FUNCTIONAL AMYLOIDS: A LINK BETWEEN YEAST MATING AND MAMMALIAN FERTILIZATION
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<td>10:50 – 11:10 a.m.</td>
<td>196</td>
<td>Scott Watkins, Carlton Johnson</td>
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**PANEL 11**  
**TRADITIONS ROOM**  
*To Build and Protect: Personal, Corporate, and National Branding*

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Speaker(s)</th>
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<tr>
<td>9:35 – 9:55 a.m.</td>
<td>175</td>
<td>Bailey White</td>
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<td>10:00 – 10:20 a.m.</td>
<td>178</td>
<td>Jessica Gorder</td>
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<tr>
<td>10:25 – 10:45 a.m.</td>
<td>186</td>
<td>Jason Berry</td>
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**PANEL 12**  
**BRAZOS ROOM**  
*#New Millennium Problems: Pollution, Cyber Victimization, and Pop Culture*

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<tr>
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<td>197</td>
<td>Ashley Hogan</td>
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<td>10:00 – 10:20 a.m.</td>
<td>200</td>
<td>Elle Rickman</td>
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<tr>
<td>10:25 – 10:45 a.m.</td>
<td>203</td>
<td>Alexandra Trevino</td>
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PLEASE SEE PAGES 15-16 FOR ABSTRACT TITLES

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17
Performing Arts Session
March 29, 2016
4:00 p.m. – 6:00 p.m.
Student Union Building: Escondido Theater

Synopsis:
Ensembles featuring undergraduates from the TTU College of Visual and Performing Arts will showcase their creative scholarship through performances in dance, theatre, and music.

Schedule:
3:50 p.m. – 4:00 p.m.  Audience Seating
4:00 p.m. – 4:05 p.m.  Session Welcome
4:05 p.m. – 6:00 p.m.  Performances

Visual Art Exhibition
March 29 - 30, 2016
9:00 a.m. – 4:00 p.m.
Student Union Building: South Ballroom

Synopsis:
This is a selection of artworks by undergraduate students in the TTU School of Art. These pieces were selected by faculty from the TTU School of Art.
Use the following key to find abstracts on specific topic more easily:

<table>
<thead>
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<th>Category</th>
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<tr>
<td><strong>Arts</strong></td>
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<tr>
<td><strong>Biological and Chemical Sciences</strong></td>
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<tr>
<td><strong>Business Emphasis</strong></td>
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<tr>
<td><strong>Humanities</strong></td>
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<tr>
<td><strong>Law, Public Policy, and Education</strong></td>
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<tr>
<td><strong>Physical Sciences</strong></td>
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<td><strong>Social Sciences</strong></td>
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Each category includes:

**ARTS**
Art History
Dance
Music
Theater
Visual Art

**BIOLOGICAL AND CHEMICAL SCIENCES**
Biology / Biochemistry
Chemistry / Biochemistry
Environmental Studies
Health Professions

**BUSINESS EMPHASIS**
Business

**HUMANITIES**
Cultural Studies
Gender Studies
Literature
Media and Communications

**LAW, PUBLIC POLICY, & EDUCATION**
Education
Legal Studies
History
Philosophy
Political Science

**PHYSICAL SCIENCES**
Computer Science Engineering
Geosciences
Mathematics
Physics / Astronomy

**SOCIAL SCIENCES**
Anthropology / Archaeology
Economics
Psychology
Social Work
Sociology
1. FUNCTIONAL SPORTS WEAR DESIGN USING 3D OPTITEX

**Presenter(s): Moloney, Briana**

**Authors: Moloney, Briana**

The purpose of this experimental design study was to develop a functional sportswear and assess the fit by utilizing 3D virtual technology. For the methodology of this study, 3D design construction method with OptiTex, 2D Gerber Pattern Design System and optical 3D body scan method have been used to creating a virtual model and constructing a virtual functional sportswear. In results, through computer-generated manipulations, we were able to view a garment without a person to visit and try on outfit. This accelerated the fit process and saved fabric materials. The design concept and patterns built into with the 2D system were easily converted into 3D system. Also, through the process, it was found that 2D patterns could be arranged on a 3D virtual model and they could be either by manually created or a 3D scan of a fit model, and virtually constructed. It was an efficient way of creating functional sportswear with the 3D design construction method. The fit was assessed by placing the sportswear with multiple spandex blends on a virtual fit model that was developed in this study. Overall, this experimental 3D design process could be apply to the current apparel companies, however, it is suggested that a technical designer must be clear on the exact process, measurements and details in assembling the functional sportswear.

2. INTERTWINING ARTISTRY AND ADVANCEMENT: CASE STUDIES OF FEMALE LEADERS IN THE DANCE FIELD

**Presenter(s): Pelham, Allison**

**Authors: Pelham, Allison**

While the dance field is characterized by participation of a female majority, male leadership representation in this field is significantly higher than that of female leadership. The purpose of this research is to reveal how female dance leaders in the academic and professional sectors practice leadership and navigate a field characterized by unequal gender representation in the United States. It will also explore the challenges women in these roles face, their strategies for success, and the issues that arise as they adapt to the various needs of the communities they serve. To observe this, three case studies will be conducted of female leaders in the dance field, from both the academic and professional dance company sectors. This research will provide insight into gender representation and inequalities within the dance field. It will also illustrate individual leaders' descriptions of overcoming obstacles to succeed in dance leadership positions, and the future shifts and opportunities that these leaders foresee for the future of female leadership and representation in the dance field.
3. DNASE1L3 TRAFFICKING IS REDIRECTED FROM SECRETION TO THE NUCLEUS IN LUPUS-PRONE MICE

**Presenter(s): Abbott, Kennady**

**Authors:** Abbott, Kennady; Wu, Wenbo; Shi, Guilan, Salter, Russell; Keyel, Peter

Pediatric-onset Systemic Lupus Erythematosus (SLE) is linked to a deficiency of the endonuclease Dnase1L3. Dnase1L3 can function extracellularly as a barrier to transfection or localize to the nucleus of macrophages to cleave DNA during apoptosis, though the mechanism by which Dnase1L3 protects from pediatric-onset SLE is unknown. Two polygenic lupus murine models, MRL-lpr and NZB/W F1, bear the activity-reducing T89I mutation in Dnase1L3. Dnase1L3 T89I has an eight-fold decrease in barrier-to-transfection activity, while the endonuclease activity is only decreased two-fold compared to the wildtype, providing a tool with which to dissect Dnase1L3 trafficking in SLE. We hypothesized that Dnase1L3 T89I localizes to the nucleus, which decreases barrier-to-transfection activity and enhances SLE onset. We transfected HEK cells with wild type or T89I Dnase1L3, and determined the subcellular localization of Dnase1L3. We found that the majority of wild type Dnase1L3 is secreted from the cell, while Dnase1L3 T89I showed increased nuclear localization. Since Dnase1L3 alters inflammasome function, we tested whether inflammatory stimuli alter Dnase1L3 trafficking. LPS treatment of cells transfected with Dnase1L3 T89I reduced its nuclear localization. Altered Dnase1L3 trafficking may impair inflammasome function, since macrophages from NZB/W F1 mice secreted less IL-1B than wild type mice. Overall, the increase in nuclear localization of Dnase1L3 T89I suggests that barrier to transfection or extracellular nuclease activity may promote IL-1B release and protect against pediatric-onset SLE.

4. OBESITY-BREAST CANCER INTERACTIONS: EFFECTS OF ADIPOCYTES ON BREAST CANCER CELLS AND PREVENTIVE EFFECTS OF OMEGA 3 FATTY ACIDS.

**Presenter(s): Alhaj, Sara**

**Authors:** Alhaj, Sara; Aljawadi, Arwa; Ramalingam, Latha, Scoggin, Shane; Moustaid-Moussa, Naima

Obesity is a disease that poses prominent health problems in the United States. Furthermore, Breast cancer is a chronic disease and a leading cause of death among all cancer types in women in the United States. There is a strong positive association between postmenopausal obesity and the development of breast cancer but the relationship between the two is not completely understood. Our research aims to understand the mechanisms by which obesity promotes the occurrence of breast cancer and to identify dietary interventions such as eicosapentaenoic acid (EPA), an omega-3 fatty acid that may reduce obesity-associated breast cancer. We hypothesized that obesity increases the risk of breast cancer through secretion of pro-inflammatory adipokines from fat cells. To test this hypothesis, we used cultured murine 3T3-L1 preadipocytes and differentiated adipocytes or human mesenchymal stem cells before or after differentiation into adipocytes, and determined their effects on human breast cancer cell lines (MCF-7 or MDA-MB-231). Conditioned media from preadipocytes or adipocytes were transferred into the breast cancer cells and levels of pro-inflammatory cytokines in the media, and gene expression in breast cancer cells were measured. Conditioned media from preadipocytes/adipocytes significantly increased breast cancer cell inflammatory markers such as interleukin 6 and 8. Furthermore, using the Seahorse extracellular flux analyzer, we also observed MCF-7 cells exposed to preadipocytes conditioned medium treated with 100µM EPA exhibited lower glycolytic activity compared to untreated control cells. In summary, our study suggests that adipocytes secreted factors influence breast cancer cell inflammation and metabolism.
5. DELTA-TOCOTRIENOL DOSE-DEPENDENTLY DECREASED ADIPOSITY AND INFLAMMATION AND INCREASED MARKERS OF LIPID OXIDATION IN HIGH FAT FED MICE

Presenter(s): Allen, London
Authors: Allen, London; Ramalingam, Latha; Moustaid-Moussa, Naima, Shen, Chwan-Li

Obesity is a disease that affects one in three American adults and is characterized by chronic low grade inflammation. Several plant bioactive compounds with anti-inflammatory properties have been used to reduce obesity and associated metabolic complications. Hence we are investigating the effect of delta-tocotrienol (dT3), a member of the vitamin E family as an anti-obesity agent. We hypothesized that dT3 will reduce obesity and insulin resistance through its anti-inflammatory and anti-oxidant properties. To test our hypothesis, we used C57BL/6J male mice that were fed a high fat diet (HF) with and without supplementation of increasing amounts of delta-tocotrienol (HF+dT3) up to 1,600mg/kg for 14 weeks. Glucose and insulin tolerance tests were administered two weeks prior to the end of treatments. At the end of the study, serum and tissues were collected for gene and protein analyses. Our results show significant improvements in glucose clearance in the dT3-supplemented groups compared to the HF group. Fat pad weights were reduced dose-dependently by dT3. These changes were also associated with smaller fat cell size and reduced macrophage content in adipose tissue from HF+dT3 compared to HF-fed mice. Mechanistic analyses revealed reduction of mRNA and protein levels of pro-inflammatory adipokines (e.g. resistin, leptin, and MCP-1) and upregulation of anti-inflammatory adipokines (e.g. adiponectin and IL-10) in HF+dT3 compared to HF-fed mice. Moreover, dT3 dose-dependently increased fatty acid oxidizing gene. In summary, dietary delta-tocotrienol exerted promising anti-obesity and anti-inflammatory effects that may be mediated in part by adipose tissue.

6. THE EFFECT OF VITAMIN B12, BIOTIN, AND THIAMINE ON PRYMNESIUM PARVUM CULTURE GROWTH

Presenter(s): Andersen, Ryley
Authors: Andersen, Ryley

We investigated the effect of various vitamins that are important factors for cell growth have on Prymnesium parvum (golden alga). The central purpose of this experiment is to understand what effect exogenous vitamins have on algal culture growth. Vitamin B12 (cobalamin), biotin, and thiamine were all tested individually as well as different combinations of the three for their effect on algal culture growth. Using a 96-well microtiter plate and spectrophotometry, we were able to track the growth rates of the algae over the course of 33 days. We had three replicates of each inoculated vitamin/culture medium combination as well as an uninoculated (negative) control for each. We measured the absorbance every three days at 550, 600, and 680 nm during the experiment. After statistical analysis, we found that the growth rates were significantly higher for the cultures containing vitamin B12, when compared to cultures that contained biotin or thiamine.

7. SEASONAL PHENOLOGY OF A JERUSALEM CRICKET (STENOPELMATUS MONAHANSENSIS) FROM THE MONAHANS SAND DUNES SYSTEM IN WESTERN TEXAS

Presenter(s): Bennett, Tyler
Authors: Bennett, Tyler; Discua, Samuel; Longing, Scott

The Monahans sand dunes system is home to a unique diversity of arthropods. The Jerusalem cricket (Stenopelmatus monahansensis) appears to be restricted to this dune system. More information is needed on the biology and ecology of this species in order to assess potential threats to populations and to provide recommendations for conservation actions. The objective of this study was to determine the seasonal phenology of S. monahansensis based on trap captures and body size measurements. A previous study suggested that S. monahansensis was active every month of the year, with peak activity in September. The current study will measure changes in body size (body length, width and head capsule diameter), sex ratios and immature and adult S. monahansensis.
occurrences over a period of 20 months. Individuals were collected by pitfall traps and by hand from March 2013 to October 2014 from the Monahans dunes. Results from this study will provide information on the life history of S. monahanensis, thus supporting further assessments of the conservation needs for this species.

8. APPLYING DIGITAL HOLOGRAPHY MICROSCOPY (DHM) TO LABEL-FREE DETECTION OF CTCs

**Presenter(s):** Berry, Jacqueline  
**Authors:** Berry, Jacqueline A.; Ahrens, Caroline C.; Dhananjay, Singh, Wei, Li; Vanapalli, Siva

Previous research has shown the importance of quantifying circulating tumor cells (CTCs) in patients with different types of cancer. These cells have been known to lead to metastatic cancer and their presence in peripheral blood is known to correlate with disease progression. Our goal is to monitor CTCs in peripheral blood to provide medical professionals with a better understanding of how each cancer can be effectively diagnosed and treated. Achieving this will lead to a better prognosis for the patient. In this work we introduced Digital Holography Microscopy (DHM) as a powerful technique to analyze low concentrations of CTCs found in peripheral blood. DHM technology is an integral component of this experiment because it allows us to identify and differentiate red blood cells, leukocytes and CTCs according to their different characteristics such as cell size and refractive index in a label-free method. In initial technology development we have used established cancer cell lines mixed with healthy donor whole blood to simulate the blood of cancer patients. These experiments using cancer cell lines are an important validation prior to our future goals to enumerate cancer cells in patient blood.

9. TUMOR CELL HYPOXIA AND OXYGEN CONSUMPTION IN A MICROFLUIDIC DEVICE

**Presenter(s):** Bond, Elise  
**Authors:** Bond, Elise

Tumor cell hypoxia is caused by an imbalance between the supply and consumption of oxygen in the tumor cell. As a tumor grows, it outgrows its blood supply and leaves areas of the tumor with lower oxygen concentrations than in healthy tissues. Because of the lower oxygen concentrations, it makes it more difficult for the cells in the tumor to be killed. This lack of oxygen not only contributes to tumor cell survival but also to drug resistance and tumor progression. This project will be focusing on tumor cell survival. We will make a multi-culture cell chip using poly (dimethyl siloxane) and fill it with tumor cells. Using this cell chip, we will inject a fluorescent dye into the chip at different oxygen levels to see how the tumor cells react.

10. NOVEL LACTIC ACID BACTERIA (L14 AND L28) AS A BIOCONTROL AGENT FOR INHIBITION OF SALMONELLA IN A RAW CHICKEN FAT USED AS A DOG FOOD INGREDIENT.

**Presenter(s):** Castillo, Adam  
**Authors:** Castillo, Adam; Franco, Jorge; Campos, David, Brashears, Mindy

Introduction: Chicken fat being a rich energy source has many important functions in the canine and feline diet. Salmonella is a major pathogen in poultry products and is a frequent vehicle of these bacteria thus posing a risk to pet food. Purpose: The objective of this study was to evaluate the effect of novel isolated lactic acid bacteria (LAB)(L14, L28) on reducing the amount of Salmonella in raw chicken fat stored at room temperature. Methods: For both control and treatment groups, approximately 40 ml of chicken fat was inoculated with a 3-strainSalmonella cocktail (Typhimurium, Enteritidis and Newport) for a final concentration of log 3.00 CFU/ml. Each treatment group received respective treatments of L14 or L28 for a final concentration of log 6.00 CFU/ml. The 40 ml chicken fat was aliquot by 10 ml for each time point. The chicken fat was enumerated on day 0, 1 and 3. Results: After 1 day there were statistical significant differences between the control and the treatments for counts ofSalmonella. After 1 and 3 days the Salmonella in the control chicken fat had grown to approximately log 5.49 CFU/ml and log 7.13 CFU/ml, respectively. For the L14 treatment on
day 3, there was a 4.06 log reduction of Salmonella. Moreover, on day 3 for L28 treatment there was a 7.13 log reduction. Significance: Pets that consume contaminated pet kibble can be colonized with Salmonella organisms without exhibiting clinical signs, making the pet a possible source of contamination to people in the household.

11. SERUM INFLUENCES PSEUDOMONAS AERUGINOSA VIRULENCE BY ALTERING THE PRODUCTION OF OUTER MEMBRANE PROTEINS

**Presenter(s):** Chehadi, Max  
**Authors:** Chehadi, Max; Dzvova, Nyaradzo; Zabet, Masoud, Harmon, Clinton; Hamood, Abdul

Severe sepsis is a common and frequently fatal condition. In United States 1,000,000 individuals with severe sepsis are hospitalized annually. Sepsis is associated with different bacterial pathogens including the gram-negative Pseudomonas aeruginosa. During sepsis, serum is likely to influence *P. aeruginosa* virulence. Using microarray analysis, we previously showed that serum alters the expression of numerous *P. aeruginosa* virulence genes including those coding for potential outer membrane proteins (OMPs). These OMPs interact directly with different serum components and systemically administered antibiotics. We hypothesize that the growth of *P. aeruginosa* in the presence of human serum significantly alters the production of OMPs. To examine this possibility, we grew *P. aeruginosa* strain PA14 in either LB broth (a laboratory medium) or LB broth containing 20% serum (LB/serum). The serum was obtained from 20 adult healthy volunteers. Outer membrane proteins were purified, separated on gel-electrophoresis, and digested. The tryptic peptides were separated using a Dionex-nano-HPLC with reverse phase column and analyzed using LTQ Orbitrap mass spectrometer. In comparison with the LB broth, the growth of PA14 in LB/serum resulted in up-regulation of 103 proteins and down-regulation of 123 others. Twenty five proteins including the FepA receptor were uniquely detected in PA14 that was grown in LB/serum whereas 32 proteins including the ABC-transporter ATP-binding protein were uniquely detected in PA14 that was grown in LB broth. These results suggest that: 1) serum influences *P. aeruginosa* virulence by altering the production of OMPs; and 2) serum either induces or eliminates certain OMPs.

12. USE OF BACTERIOPHAGES TO TREAT MRSA INFECTION

**Presenter(s):** Chu, Bryan  
**Authors:** Chu, Bryan; Schettwan, Blake

After the discovery of antibiotics, bacteria have become more and more resistant to them. One very concerning example is Staphylococcus aureus which has developed a methicillin resistant strain known as MRSA. The presence of MRSA is a huge problem in the medical field. Its infections lead to many deaths per year. Many people that are immunely compromised are not able to fight off MRSA infections with antibiotics anymore. There is a need to treat MRSA with means other than antibiotics. One of those methods is the use of bacteria specific phage to target the MRSA. Bacteriophage is able to utilize the host MRSA to reproduce more phages. The phage will then lyse the host bacteria and release new phages. This research involves a mouse wound model that is artificially wounded and infected with MRSA then treated with a phage cocktail. We then dissect a piece of the wound tissue to be plated out and measured in number of visual bacteria colonies per gram of tissue. So far, it can be seen that the group treated with phage has less bacteria colonies per gram of tissue than the control by at least a factor of 10. However, these studies are preliminary and we are in the process of further refining phage therapy. There are other studies done that include mapping the growth curve of different phage to determine which phage is most effective. Also, whether the use of ions can help with phage absorption.
13. SURFACE-WATER DYNAMICS OF SALT PLAYAS IN TEXAS OVER A 27-YEAR SPAN

**Presenter(s): Claassen, Caroline**

**Authors:** Claassen, Caroline; Heintzman, Lucas; Starr, Scott; McIntyre, Nancy

Seasonal and interannual surface-water dynamics over the past 27 years in the 39 salt playas (salinas) occurring within a ~149,810 km² portion of Texas were examined. These groundwater- and precipitation-fed wetlands are regionally unique habitats with high salt concentrations and halophytic biota that may be vulnerable to changes from groundwater extraction for agriculture. Landsat imagery from four satellite scenes was used to detect water within the 39 salina basins over seven dates (comparing summer and winter, representing periods of high and low groundwater demand, respectively) from 1986-2013, comprising all of the cloud-free data available simultaneously for all four scenes. During this span for the study area, the saturated thickness of the underlying Ogallala Aquifer decreased by ~0.19%, and the amounts of total and irrigated cropland increased in area. There was individual variation in surface water area per salina, with two salina basins never holding water at all during the duration of the study. Most salinas went dry at least once (although not simultaneously or in the same region), slightly more frequently during the summer than in winter. These results suggest that these wetlands are being impacted by human changes to the landscape. Human activities are diminishing groundwater inputs to these wetlands, effectively creating novel wetlands that are now primarily or only supplied by precipitation and no longer by groundwater, thereby potentially altering water chemistry and biota. These novel wetlands no longer have the same hydrological or ecological dynamics and may exacerbate vulnerability to projected climate change.

14. DEVELOPMENT AND VALIDATION OF A PLUS MAZE ANXIETY TEST IN AFRICAN CLAWED FROGS (XENOPUS LAEVIS)

**Presenter(s): Coleman, Boone**

**Authors:** Coleman, Boone; Carr, James; Harris, Breanna

Anxiety is a complex and evolutionarily conserved state that is often associated with behavioral changes. Although rodent models of anxiety exist, there is a need for models in other species as multiple models will allow for a cross-species comparison of the neural and behavioral mechanisms underlying anxiety. We will validate an anxiety test in frogs. A plus maze, a standard rodent anxiety test, consists of 2 “light” open arms and 2 “dark” closed arms adjoined together at a plus shaped cross section. Most animals dislike bright, open spaces, likely because in these spaces they would be vulnerable to predation, and thus increased time spent in the light arms is indicative of lower levels of anxiety. Here, we will establish that: 1) the plus maze model works in African Clawed frogs (Xenopus laevis) and 2) this model is a valid measure of anxiety. To do this, we will build an aquatic plus maze and score baseline frog behavior. Time spent in each arm, the time spent in the center cross section, and the number of entries into each arm (dark & light) will be scored. In baseline conditions, frogs should spend more time in the dark arms and display decreased exploratory behavior. Next, we will use two drugs, one benzodiazepine and one SSRI, to determine if the behaviors displayed in the plus maze can be altered by anxiolytic drugs. In comparison to baseline conditions, we predict frogs treated with anxiolytics will show increased time spent in light arms and increased exploratory behavior.

15. EFFECTS OF OMEGA 3 FATTY ACIDS ON INFLAMMATION IN C. ELEGANS

**Presenter(s): Coleman, Elise**

**Authors:** Coleman, Elise; Har Udahawatte, Shashika; Ramalingam, Latha, Moustaid-Moussa, Naima; Vanapalli, Siva

Obesity is characterized by chronic low grade inflammation which contributes to impairments in adipose tissue function, lipid metabolism, and insulin sensitivity, often leading to type 2 diabetes. Research has shown that omega 3 polyunsaturated fatty acids from fish oil could lower inflammation, reduce fatty liver, glucose intolerance, and insulin resistance. However, further studies are needed to...
understand the mechanism of action of these fatty acids in obesity and diabetes. To understand these mechanisms, we will use the nematode Caenorhabditis elegans (C. elegans) as a model for obesity-related inflammation and oxidative stress. C. elegans is a cost effective and simple organism whose genome is well mapped. Additionally, its short life span facilitates aging investigations. The objective of this research project is to develop methods to grow and maintain C. elegans in traditional agar plates, and isolate RNAs from it to study changes in gene expression for lipid and inflammation and oxidative stress pathways under different fatty acid treatments. We are also using novel microfluidic devices to determine the effects of fatty acids on C. elegans physiology and lifespan. We have made progress in establishing this model by maintaining a population of C. elegans, constructing microfluidic devices that will house the C. elegans and isolated good quality RNA from the worms. Next step is to develop methods to stain lipids in C. elegans and determine how fatty acids will modify them. This project is funded by a USDA NIFA AFRI grant and supported in part by the Honors College and the Undergraduate Research Scholars Program.

16. SPECIES SPECIFIC VIRAL DNA INSERTION OF HEPATITIS B IN OSTEOLAEMUS TETRASPIS

**Presenter(s):** Crocco, Katherine

**Authors:** Suh, Alexander; Ray, David; Osmanski, Austin, Densmore, Lou; Crocco, Katherine

An estimated 240 million people world-wide are chronically infected with some form of Hepatitis B virus, however humans are not the only organisms susceptible to these viruses. Previous studies have concluded that viruses within the Hepadnavirid family have infected many vertebrates since the Mesozoic era, much earlier than previously thought. Through whole genome analyses, researchers have found endogenous Hepatitis B viruses (eHBVs) in birds, turtles, snakes and crocodilians. The earliest HBV infection and subsequent endogenization into the genome was dated over 200 million years ago. In this study we attempt to detect eHBVs in three crocodilians: the dwarf crocodile (Osteolaemus tetraspis), saltwater crocodile (Crocodylus porosus), and the slender-snouted crocodile (Mecistops cataphractus). Presence of an eHBV is detectable by using PCR and gel electrophoresis, positive results exhibit DNA fragments of 350 bp and negative results produce 250 bp amplicons. Analyses of eight crocodilian samples have thus far failed to yield positive results for the presence of eHBVs. Further analyses of different crocodilian species are needed to determine how widespread HBVs were in early crocodilian evolution.

17. THE RELATIONSHIP BETWEEN SEDENTARY TIME AND CONDITIONED PAIN MODULATION AMONG YOUNG HEALTHY ADULTS

**Presenter(s):** Cross, Austin

**Authors:** Cross, Austin; Umeda, Masataka

Introduction: Previous research has shown a positive correlation between physical activity (PA) and a person’s pain modulation abilities. Higher physical activity levels have been associated with greater ability to modulate pain. There has been little evidence verifying a correlation between pain modulation and a sedentary lifestyle. Purpose: This study examined the relationship between pain modulation capabilities and sedentary time from a physical activity standpoint. Methods: Twenty-five, young (18-30 yrs old), healthy participants, including one African American male, four African American females, nine non-Hispanic white males, and eleven non-Hispanic white females volunteered for this study. Participants’ PA levels were assessed using the International PA Questionnaire (IPAQ), and an accelerometer that objectively monitors activity levels. Pain modulation abilities were quantified using a conditioned pain modulation test, where changes in baseline pain ratings to electrical pain stimulus to the ankle were determined in comparison to during and after concurrent application of pressure stimulus on the finger. The change scores, reflecting an ability to modulate pain, were then correlated to sedentary time. Results: As expected, pain ratings were substantially reduced during and after concurrent application of pressure stimulus compared to baseline. In general, the change scores were not significantly correlated to sedentary times as assessed by IPAQ and accelerometer. Conclusion: These results suggest that sedentary time may
not be associated with the capacity to modulate pain, at least, among these young healthy adults. We are still collecting data for this study, and plan to present complete findings in the conference.

18. EFFECTS OF GUAR GUM ON INFLAMMATION IN ADIPOCYTES

**Presenter(s): Dameron, Elizabeth**

**Authors:** Dameron, Elizabeth; Scoggin, Shane; Ramalingam, Latha, Abidi, Noureddine; Moustaid-Moussa, Naima

Obesity is a complex disease that affects in the United States more than one third of adults and over 17% of children. Obesity and related diseases such as diabetes and cardiovascular disease, are associated with a chronic low-grade inflammation. Several food and plant bioactive components possess anti-inflammatory properties. We are specifically interested in potential benefits of guar gum (GG) in reducing obesity-associated inflammation. GG is the ground endosperm of a seed from the plant Cyamopsis tetragonoloba, and was recently shown in rodents to lower glucose and cholesterol levels. However, mechanisms by which GG regulates inflammation or fat cell metabolism remains unknown. We hypothesize that GG reduces inflammation in adipocytes thereby preventing obesity-associated metabolic disorders. To test our hypothesis, we used undifferentiated 3T3-L1 cells, stably transfected with an NFK-B-luciferase DNA construct. Nuclear factor kappa-light-chain-enhancer of activated B cells (NFK-B) is a major transcription factor that regulates inflammatory processes. Luciferase is used as a reporter gene for NFK-B activity. We treated cells with different GG concentrations, up to 1000 mg/mL then collected cell extracts and culture media to measure luciferase activity by luminometry and secreted inflammatory cytokines by ELISA, respectively. Our results showed that GG significantly reduced inflammation, assessed by lower cell NFK-B activity and secreted interleukin-6 (IL-6) levels in GG-treated cells compared to control non-treated cells. Experiments are currently underway in differentiated adipocytes to determine whether GG regulates lipid metabolism and other inflammatory markers. We conclude that guar gum has promising beneficial anti-inflammatory effects that may help reduce obesity-related metabolic complications.

19. UPTAKE AND TRANSLOCATION OF CARBON NANOTUBES OF VARIOUS SIZE AND FUNCTIONALITY IN CARROTS

**Presenter(s): Deleon, Sabrina**

**Authors:** Parra, Amanda; Payton, Paxton; Saed, Mohammed, Canas-Carrell, Jaclyn

Carbon nanotubes are one of the most used manufactured nanomaterials and are used in a variety of fields of research. However, these materials are not regulated and there are concerns regarding their safety for the environment and human health. This current study evaluated the uptake of various types of carbon nanotubes in carrots, a true root plant. Carrots were exposed to either non-functionalized carbon nanotubes (CNTs) or functionalized carbon nanotubes (COOH-CNTs). Carrot plants were grown for 60 d in soil with no CNTs/COOH-CNTs or 10 mg/kg of CNTs or COOH-CNTs in a greenhouse with natural day: night conditions. Following harvest at 60 d, roots, stems, and leaves were dried, grounded, and analyzed using a microwave-induced heating technique to quantify CNT and COOH-CNT concentrations in the carrots. Plants analyses are currently ongoing.

20. ROLE OF THE ENDOPLASMIC RETICULUM IN ANGIOTENSIN-INDUCED ADIPOSE TISSUE INFLAMMATION

**Presenter(s): Dinh, Tram**

**Authors:** Dinh, Tram; Ramalingam, Latha; Kalupahana, Nishan, Moustaid-Moussa, Naima

Over a third of the American population is diagnosed with obesity and patients with obesity often suffer from other diseases such as type 2 diabetes, heart disease, and hypertension. Angiotensinogen (Agt), the protein precursor of Angiotensin II (Ang II), regulates blood pressure. Both Ang II and Agt are secreted locally in adipose tissue and into the bloodstream. Increased levels of these proteins are associated with obesity, inflammation, and insulin resistance. Studies conducted
in our laboratory showed that mice engineered to overexpress Agt in adipose tissue have higher levels of adipose tissue and serum inflammation and endoplasmic reticulum (ER) stress. These mice also exhibited glucose intolerance and insulin resistance that may be results of high inflammation or ER stress. However, whether ER stress contributes to inflammation or vice versa in this mouse model is still unanswered. Our hypothesis is that ER stress is responsible for inflammation that is associated with obesity. To test this hypothesis, we used cultured adipocytes treated with an ER inhibitor (tauroursodeoxycholic acid, TUDCA), to determine whether this will prevent/increase inflammation. We will measure ER stress markers such as C/EBP homologous protein (CHOP) and activating transcription factor 4 (ATF4), and inflammatory markers such as tumor necrosis factor (TNF alpha) and monocyte chemoattractant protein (MCP1). If ER stress regulates inflammation, then we expect to see a decrease in inflammation with ER stress inhibitors. This research will help understand the role of ER stress in angiotensin and obesity-associated diseases such as insulin resistance and hypertension.

21. PATTERNS OF GENETIC DIVERSIFICATION IN A WIDELY DISTRIBUTED SPECIES OF BAT, MOLOSSUS MOLOSSUS, BASED ON A NUCLER MARKER

**Presenter(s):** Donckels, Kelsey

**Authors:** Donckels, Kelsey; Lindsey, Laramie; Ammerman, Loren, Bradley, Robert

The taxonomy and evolutionary relationships of the velvety free-tailed bat, Molossus molossus, from Central and South America long has been debated. Within this species, and for the entire genus Molossus, specimens have been difficult to identify and have presented several taxonomic challenges. DNA sequencing data can be used to compare and propose evolutionary relationships between different organisms. The objective of this project was to characterize the genetic relationship among individuals representing subspecies of the widely distributed species, M. molossus, based on the nuclear marker beta fibrinogen (beta-fib). To obtain these results, we extracted DNA from Molossus tissues using a lysis buffer, and then amplified the intron 7 of beta-fib using Polymerase Chain Reaction. Once the DNA was amplified, we performed traditional Sanger cycle sequencing. A Bayesian analysis was conducted with M. rufus as an outgroup and genetic divergence was estimated. Our results indicate that some currently recognized subspecies of M. molossus are consistent with the lineages recovered, and are consistent with lineages recovered in a mitochondrial gene tree (cytochrome b) from previous work. However, not all recognized subspecies of M. molossus were recovered by this analysis suggesting that several taxonomic revisions are needed. Overall there was low average genetic divergence across all specimens.

22. PREDATOR PRESENCE DECREASES FOOD CONSUMPTION IN JUVENILE XENOPUS LAEVIS

**Presenter(s):** Duggan, Paul

**Authors:** Duggan, Paul; Prater, Christine; Carr, James, Harris, Breanna

Animals in the wild are threatened by the attack of predators and thus face a tradeoff between food and safety. This tradeoff governs many animal behaviors. Predators can have direct (i.e., killing) and non-life-threatening (fear/anxiety) effects on prey. We developed a predator-avoidance model in Xenopus laevis to study the non-life-threatening effects of predation. We asked 1) what is the effect of the presence of a conspecific (size-matched or large) on frog behavior?, and 2) what is the effect of a conspecific on behavior in the presence of food? We exposed 12 juvenile frogs to a control (no frog), a size-matched conspecific, or a large frog (predator) and recorded behavior. Frogs were allowed to acclimate, were exposed to the conspecific alone, and then to conspecific + food. The 12 frogs were exposed to all three scenarios over 1 week. We predicted that in the presence of the large but not size-matched frog, focal frogs would 1) increase fear/anxiety-like behaviors and 2) decrease food consumption. Presence of a conspecific, small or large, did not alter measured behaviors. In the food + conspecific condition, however, focal frogs ate less, spent less time eating, and approached the liver more slowly in the presence of large frog. Overall, frogs did not prefer the provided hide and only a few hid, but tended to do so in the presence of the large frog. Next, we will determine if
anxiolytic drugs ameliorate the effects of the large frog and decrease anxiety behavior and increase food consumption.

23. MATURE SERTOLI CELLS TRANSIENTLY REINITIATE PROLIFERATION AFTER SYNGENEIC AND ALLOGENEIC TRANSPLANTATION

**Presenter(s): Dziuk, Rachel**

**Authors:** Dziuk, Rachel; Vadala, Scott; Kaur, Gurvinder, Dufour, Jannette M.

Sertoli cells (SCs) are somatic cells that form the blood testis barrier (BTB) and create a unique microenvironment within the seminiferous tubules for spermatogenesis. According to dogma, SCs are terminally differentiated after puberty. However, new research contradicts this dogma. We previously demonstrated that Lewis rat SCs reinitiate proliferation for approximately 14 days after syngeneic and allogeneic transplantation. Since transplantation elicits multiple affects on SCs, we hypothesize the loss of SC-SC contact, inflammation, and interactions with alpha-smooth muscle actin (sm alpha actin) positive myoid cells (common contaminant of SC transplants) influence SC proliferation. Purified 22-27-day-old Lewis rat SCs were transplanted under the kidney capsules of recipient adult Lewis rats or immunodeficient, non-obese, diabetic SCID gamma (NSG) mice. Recipient graft-bearing kidneys were removed at day 10 and double immunostained for SC marker, WT1, and BTB tight junction protein marker, claudin-11, to analyze SC-SC contact, immunostained for macrophage infiltration to analyze inflammation, and double immunostained for sm alpha actin and WT1 or claudin-11 to analyze myoid cells. Claudin-11 expression was higher in SCs arranged in tubules compared to SCs outside of tubules in both grafts. Macrophage infiltration was also observed in the grafts. Interestingly, sm alpha actin positive cells surrounded the SC tubules and seemed to reinforce the claudin-11 cell junction associations. These data indicate loss of SC-SC contact and macrophage infiltration may cause mature SCs to transiently reinitiate proliferation, and the reformation of SC-SC contacts with the help of supporting myoid cells may cease their proliferation.

24. MICROBIAL PRESENCE OF SALMONELLA AND ESCHERICHIA COLI O157 FOUND IN SMALL-RUMINANT FECAL SAMPLES FROM THE BAHAMAS

**Presenter(s): Echevarria, Jorge**

**Authors:** Echevarria, Jorge; Miller, Mark; Hanlon, Keelyn, Brashears, Mindy

Salmonella and Escherichia coli are pathogenic microorganisms highly researched as a food safety concern, and studied for their presence in livestock. However, more information is needed on their presence in other animals, such as sheep and goats. Information on the presence of these microorganisms in small-ruminants is necessary, so handling and processing can address potential pathogen contamination. The purpose of this research is to provide information on the presence of Salmonella and E. coli in small-ruminants in the Bahamas. Fecal samples (N = 118) were collected over three years, from pens containing sheep and goats from the Bahamas. Sample were collected in individual containers and stored cold until analysis. Selective and differential media were used to detect targeted microorganisms.

This research is intended to identify frequency of pathogen detection in the fecal samples of small-ruminants from the Bahamas. Presence of Salmonella and E. coli can be compared from 2014, 2015 and 2016, while also creating an average over time. This information can be used to establish better food safety policies for breeding and processing of small ruminants in the Caribbean.
25. A HIGH-THROUGHPUT, MICROFLUIDIC PLATFORM FOR THE STUDY OF LIFESPAN EXTENSION BY DIETARY RESTRICTION IN C. ELEGANS.

**Presenter(s):** Edwards, Hunter

**Authors:** Edwards, Hunter; Rahman, Mizanur; Hewitt, Jennifer; Gabrilska, Rebecca; Vanapalli, Siva

Caenorhabditis elegans (C. elegans) is a well-established genetic model that has emerged as the basis of many life science studies due its advantageous characteristics including short lifespan (3-5 weeks), a fully sequenced genome, and a well-defined cell lineage. Specifically, C. elegans has become a highly utilized organism for studying lifespan-influencing pathways that are often preserved across other organisms such as yeast, mice, and humans. Dietary restriction is one of these major pathways that has been shown to extend lifespan in these organisms. Currently, there are eight described methods of inducing dietary restriction in C. elegans with each method extending lifespan by independent and overlapping genetic pathways. Traditional C. elegans studies on agarose plates or liquid assays are tedious and may require the use of drugs that prevent the development of progeny. In this study, we propose a simple, microfluidic device that has the capability of capturing the effects of liquid bacterial dietary restriction on populations and individuals of C. elegans. E. coli OP50 suspended in media is concentrated to the standard concentration of 100 mg/mL and then serially diluted to obtain dietary restriction concentrations at 10x and 100x dilution. A lifespan extension of 50 to 60% would confirm the efficacy of the high-throughput microfluidic platform to induce dietary restriction.

26. AROUSAL DURATION EFFECTS ON HIBERNATING BATS

**Presenter(s):** Esparza, Aaron

**Authors:** McGuire, Liam

Hibernating bats drop their body temperature to ambient temperature and rely solely on stored energy to survive the winters. Periodic arousals to normal body temperature account for the majority of energy expenditure in hibernating bats. Bats with white-nose syndrome (WNS), a fungal disease introduced to North America, suffer increased arousal frequency, therefore depleting their energy stores. While arousal frequency has been considered in WNS studies, technical limitations of data loggers used in previous studies only allow coarse estimates of arousal duration. I tested two hypotheses 1) arousal durations would be shorter, allowing bats to save energy and potentially prolong the hibernation period, or 2) arousal durations would be longer, allowing for a more effective immune response to fight off the fungal infection. I used motion-sensitive cameras to determine arousal durations of bats hibernating in captivity. Two groups of bats (n=14 & n=17) were inoculated with the fungus that causes WNS, and two controls groups (n=14 & n=17) were sham inoculated. Inoculated bats had longer arousals (65.28 ± 21.62 min) compared to control bats (54.88 ± 26.75 min). I modelled the energy required for a full hibernation period and showed that increased arousal frequency and duration combined resulted in a 23% increase in energy expenditure, whereas increased arousal duration alone accounted for an 8% energy expenditure difference between healthy and WNS bats. Longer arousal durations are an important energetic cost factor not considered in previous WNS studies. However, a 10.4 minute difference might not substantially affect immune response.

27. LIPID PROFILE AND PROXIMATE ANALYSIS OF FREE RANGE AND COMMERCIALY-RAISED BROILERS AVAILABLE IN RETAIL OUTLETS IN LUBBOCK, TEXAS.

**Presenter(s):** Estevez, Jorge

**Authors:** Estevez, Jorge; Krieg, Andrea; Thompson, Leslie

"Free range" in broiler production is a relatively new trend that suggests a better treatment of animals produced for food. Some consumers believe that "free range" also suggests improved nutritional benefits of the food item over conventionally produced items, which supports free-range management system over conventional manner. However, the idea of removing confinement brings
health and economic costs due to the higher cost involved in maintaining the same amount of poultry in an extended safety-parameter area. This study will be conducted with the objective of comparing the proximate composition and lipid profile, specifically free fatty acid, cholesterol and overall lipid content, of raw and oven roasted (end-point cooking temperature of 74°C), light (breast) and dark (drums and thighs) broiler meat (with and without skin) produced under conventional or free range management methods. A total of 48 whole broiler carcasses, half labeled as "free range" and half conventionally produced will be purchased on two different days from two retail locations in Lubbock, Texas. Additionally, data will be collected on parts yields and cooking losses. Preliminary information collected demonstrates the effect of marketing of these products, which gives importance to this study - free range poultry is more expensive than conventional poultry and there appears to be growing demand for this product. This study will provide preliminary data to demonstrate if significant compositional differences exist between broiler meat produced conventionally or in "free range" systems.

28. INVESTIGATING THE ROLE OF MRSA IN NECROTIZING SOFT TISSUE INFECTIONS

Presenter(s): Fell, Cody
Authors: Fell, Cody; Gabrilska, Rebecca; Rumbaugh, Kendra

Staphylococcus aureus is widely known to be one of the leading causative agents of skin and soft tissue infections (SSTI) in the world. Due to emerging antibiotic-resistant strains of S. aureus, such as community-associated multidrug-resistant S. aureus (CA-MRSA), the number of people admitted to hospitals for SSTIs, including those for necrotizing soft tissue infections (NSTI), increased from 1.2 million in 1996 to 3.28 million in 2005. There are currently few virulence factors in S. aureus believed to contribute to NSTI formation; however, most of these have not been thoroughly investigated. Furthermore, variations in bacterial density may phenotypically manifest differently as simple abscesses or necrotic infections. Here we use a mouse model to investigate the potential role that bacterial density or specific virulence factors play on abscess formation versus NSTIs of different strains of S. aureus. Through these data, we hope to better understand the differences in formation of abscesses versus necrosis and the virulence of S. aureus in these infections.

29. CONSUMER ASSESSMENT OF DOMESTIC LAMB LOINS FROM 3 MARBLING LEVELS AGED 21 OR 42 D.

Presenter(s): Flores, Erasmo
Authors: Flores, Erasmo; Phelps, Mallorie; Garmyn, Andrea, Brooks, J Chance; Miller, Mark

Lamb is one of the red meats, along with beef and pork, which is consumed in the U.S. and various countries around the world. In the U.S., lamb consumption is the lowest of the red meats, with the level of consumption being influenced by differences in palatability, affecting consumer acceptability. The objective of this study was to evaluate the effects of marbling level and aging treatment on palatability of lamb loin chops as determined by U.S. consumers. Full lamb loins (IMPS 232; 1 x 1) representing 3 distinct marbling levels (low, medium, and high) were obtained from a commercial lamb processor in Greeley, CO. One side was aged to 21d postmortem, while the other was aged until 42d postmortem, resulting in a 3 x 2 factorial design. Untrained consumer sensory analysis will be performed to determine the tenderness rating and acceptability, juiciness rating and acceptability, flavor liking and acceptability, as well as overall liking and acceptability. Data will be analyzed using SAS. Based on previous research in pork and beef, we expect consumers will favor lamb loins with higher marbling levels and longer aging, resulting in higher scores for tenderness, juiciness, flavor, and overall liking.
30. MALDI-TOF AS A NEW TOOL FOR QUANTIFICATION OF POLYAMINES IN PLANTS

**Presenter(s):** Fokar, Aicha  
**Authors:** Fokar, Aicha; Zabet, Masoud; Fokar, Mohamed  

Polyamines (PAs) are straight-chained C3-C15 aliphatic hydrocarbons substituted with amine groups and are considered a major secondary metabolite regulating cellular growth and development. In plants, polyamines have been implicated in a wide range of processes including responses to biotic and abiotic stress, cell elongation, senescence and hormonal signals. Despite the large understanding of their ubiquitous role, their exact function remains unclear. This is partially due to the difficulties associated with measuring natural polyamines in plants. In an effort to identify the exact functions of these molecules, we are looking to discover an accurate and reproducible means by which we can measure them. The purpose of this study is to develop a new, fast and reliable method to quantify polyamines to further understand the role of polyamines in signal transduction, plant development and responses to stress. MALDI-MS has been used for the analysis of variety of small molecules. In this case, we applied MALDI-TOF for the qualitative and quantitative analysis of dansylated PAs. In order to quantify the PAs, we obtained calibration curves for each using hexamethylenediamine as the internal standard. This will be required in gaining a meaningful understanding of polyamine homeostasis in the plant cell. In this study, we investigate the application of MALDI-TOF as a new tool for qualitative and quantitative analysis of polyamines using model plants Arabidopsis (Arabidopsis thaliana) and Tobacco (Nicotiana tabacum). Further, we will apply this method to analyze polyamines extracted from various mutant lines with lesions in plant hormone biosynthesis and signaling genes.

31. COMPARISON OF COMMERCIALLY AVAILABLE AND NOVEL LACTIC ACID BACTERIA (L28, FS56) AS BIO-SANITIZERS TO INHIBIT LISTERIA MONOCYTOGENES ON STAINLESS STEEL SURFACES.

**Presenter(s):** Franco, Jorge  
**Authors:** Franco, Jorge; Campos, David; Castillo, Adam, Brashears, Mindy  

Introduction: Listeria monocytogenes is known to have the ability to attach and form biofilms on many surfaces including stainless steel. Biofilm is not easily removed with common chemical sanitizing methods used in the industry. Finding innovative ways to inhibit Listeria monocytogenes growth and biofilm formation is necessary. Purpose: The purpose of this experiment was to evaluate a novel (L28) Lactic Acid Bacteria and commercially available (FS56) Lactic Acid Bacteria in inhibition of Listeria monocytogenes (N1-002) on stainless steel coupons at room temperature. Methods: Sterile stainless steel coupons (2cm x 2cm) were placed into 6-well plates with 2ml of Listeria monocytogenes (log10 5.00 cfu/ml) and incubated 24 hours for attachment. After the 24 hours the Listeria monocytogenes was removed and each treatment and control were added. The treatments were with strains L28, FS56 at a concentration of log10 8.00 cfu/ml and the control was with a blank of de Man, Rogosa and Sharpe (MRS) Broth. The Listeria monocytogenes counts were evaluated on modified oxford agar. Results: Our results indicate statistical differences (P<.05) among all of our treatments and our control for counts of Listeria monocytogenes. By the end of the 24 hours the MRS control had increased to log 5.76 cfu/cm² of Listeria monocytogenes. For the treatments, FS56 and L28 had log reduction of 3.1 cfu/cm² and 5.76cfu/cm² respectively. Significance: It is important to optimize these cultures for maximum impact. LAB can be provided to processors in various forms (frozen, liquid or freeze-dried) and application can be easily implemented into current operations.


**Presenter(s):** Fried, Holden  
**Authors:** Fried, Holden; Cetin, Mustafa; Mayer, Michael  

In this project, a new method to prepare [2]rotaxanes was achieved. A [2]rotaxane is an example of a mechanically-interlocked compound, specifically, where a linear axle (distopped olefin) threads a macrocyclic ring; the two species cannot be separated without significant distortion of the covalent
bond network. In this new method, a [2]catenane is inserted into the distoppered olefin by ring-opening metathesis (ROM) and cross metathesis (CM). This process is thermodynamically controlled via dynamic ring-chain equilibration. Reaction conditions were optimized to obtain an 88% isolated yield of the [2]rotaxane from the reaction of the [2]catenane and the distoppered olefin. Crystal structures were obtained for the core complex of the catenane and the product while the product was characterized by 1H and 13C NMR spectroscopy, as well as by size-exclusion chromatography. This method is a viable and promising new strategy for the synthesis of [2]rotaxanes.

33. CHOLESTEROL-BINDING DOMAINS FROM PORE-FORMING TOXINS LIMIT STREPTOLYSIN LETHALITY

Presenter(s): Gallegos, Shawna
Authors: Gallegos, Shawna; Keyel, Peter

The mechanism of how cells survive cholesterol-dependent cytolysins is not known. Cholesterol-dependent cytolysins, including Streptolysin O (SLO), Anthrolysin O (ALO) and Perfringolysin O (PFO), comprise a large family of bacterial virulence factors that bind cholesterol in the host cell membrane and form lytic pores. Pores are sequestered in blebs and shed, permitting cell survival, but this shedding mechanism is not understood. Since cholesterol governs membrane fluidity, we examined what roles cholesterol plays in toxin binding, sequestration and shedding. We hypothesize that cholesterol promotes both toxin binding and membrane shedding. To test this hypothesis, we altered cholesterol availability in cell membranes and test SLO binding, shedding and killing. We restricted cholesterol availability by treating HeLa cells with the ALO or PFO cholesterol binding region (ALO/PFO d4) in combination with wild type SLO. To do this, we purified ALO and PFO d4 from bacteria. When we treated cells in combination with SLO and a 10-fold molar excess of ALO d4, we found that SLO toxicity was inhibited. In order to determine whether SLO binding is impaired, we are generating recombinant ALO and PFO d4 fused to the fluorophore tdTomato by overlap PCR and labeling SLO with the fluorophore Cy5. We will examine toxicity and binding by flow cytometry and then titrate the amount of ALO or PFO d4 to tune cholesterol availability. These results show how cholesterol availability alters toxin binding and killing. This is the first step to understanding how cholesterol regulates cell survival.

34. EFFECTIVENESS OF NI-07 AS AN ANTI-TUMOR AGENT ON CANINE OSTEOSARCOMA CELLS

Presenter(s): Galvan, Stacy
Authors: Galvan, Stacy; Golalahon, Lauren

The Greater Burdock plant (Arctium Lappa L.) has been used in tea production worldwide for millennia and demonstrates strong medicinal properties for several ailments and conditions. More recently, quantitative analytical studies show that burdock roots exhibit natural neuroprotective activity, anti-inflammatory, anti-hyperglycemic, anti-oxidant and anti-cancer properties. In this study, we further investigate the anti-cancer properties and lack of cytotoxicity to normal cells from an extract derived from the roots. This proprietary extract called NI-07 has shown its effectiveness on a variety of human cancer cells in vitro at a concentration of 36mM (20X). Here, we further extend our investigation of it effectiveness on canine osteosarcoma cells and normal canine kidney cells. We hypothesized that there will be no significant difference in either LD50 concentration (36mM) or time to death between canine and human cells. Results showed no significant difference in mechanisms of action between human and canine cells. We further hypothesized that a decrease in NI-07 concentration to 1.8mM (1X) would attenuate the time to cancer cell death, but not overall effectiveness. Results showed a steady increase in cell death by day 5 in as low as 1.8mM NI-07. Furthermore, we demonstrate no cytotoxicity in canine and human normal cells up to 7.2 M. In conclusion, NI-07 appears to work similarly between different mammalian species, lowered concentrations attenuate time to cell death and that it continues to demonstrate strong safety and no cytotoxicity to normal cells, increasing the need to develop this into a viable anti-cancer treatment.
35. THE USE OF A STAPHYLOCOCCUS AUREUS PHAGE COCKTAIL TO TREAT MRSA WOUNDS IN DIABETIC MICE

**Presenter(s):** George, Asher  
**Authors:** George, Asher; Ramasubramanian, Bhagavathi; Galindo, Ryan, Fralick, Joe

Diabetic individuals exhibit characteristics that leave them susceptible to infections such as those of methicillin-resistant Staphylococcus aureus (MRSA). The purpose of this project was to determine the efficacy of our phage cocktail in treating a MRSA infected wound, employing a diabetic mouse model. To conduct these studies, we initiated a diabetic state by injecting each mouse with Streptozotocin and followed their serum glucose levels. When the mice were in a diabetic state, we surgically made a wound and inoculated it with $10^4$ MRSA. Some of the infected wounds were treated with a phage cocktail consisting of 3 different S. aureus-specific phages (experimental) and some weren’t (controls). The multiplicity of infection (MOI) employed in our initial studies was 1000. The wounds were covered with a waterproof bandage and the mice were followed for different periods of time. At the end of the experiment, the mice were euthanized and the wounds were surgically removed, and the number of MRSA and phage per mg of wound tissue was determined. In our initial studies we found that after 7 days of infection, the wounds of the phage-treated mice appeared healed and had approximately 10X fewer MRSA than did the controls, whose wounds had not healed. We are continuing our study varying the frequency and amount of phage applied to the wounds to better optimize our treatment regime.

36. LONG-TERM EFFECTS OF EARLY-LIFE EXPOSURE TO OLANZAPINE

**Presenter(s):** George, Brianna  
**Authors:** George, Brianna; Ramalingam, Latha; Menikdewella, Kalhara, Soto, Paul; Moustaid-Moussa, Naima

An increasing number of children are prescribed antipsychotic medications, such as olanzapine, which is known to cause excessive weight gain and other metabolic issues. This has raised concerns of long-term complications such as obesity, diabetes and heart disease. We propose to use fish oil to counteract metabolic complications associated with antipsychotic drugs. This project tested the effects of olanzapine and fish oil, individually or in combination in mice fed high fat diets. Male C57BL/6J mice (N=32) were given plain cookie dough or cookie dough with olanzapine (3 and then 6 mg/kg/day) from postnatal day (PND) 37 to 65. Mice were maintained on a high fat (HF)-high sucrose (HS) diet, with or without fish oil (FO) supplementation, resulting in four groups of mice (n=8 per group): HF-HS, HF-HS with olanzapine, HF-HS-FO, and HF-HS-FO with olanzapine. Body weight and food consumption were measured daily. Glucose and insulin tolerance were assessed in adulthood (greater or equal to PND 90). Mice exposed to FO and olanzapine had lower body weights compared to HF-HS diet alone, despite equivalent amounts of food consumed between the groups. Glucose clearance rates were higher in the HF-HS with olanzapine and FO supplementation group compared to HF-HS fed mice. In conclusion, the results demonstrated long-lasting effects of early-life exposure to olanzapine on body weight and metabolism that were comparable to fish oil effects. Gene expression analyses of genes related to lipid metabolism, as well as triglyceride content in the liver are currently underway to determine the mechanisms mediating long-term effects of olanzapine.

37. ROLE OF OLFACTORY CUES IN PREY CAPTURE BEHAVIOR OF THE AFRICAN CLAWED FROG, XENOPUS LAEVIS.

**Presenter(s):** Gomez-Pilcher, Ashlie  
**Authors:** Ashlie, Gomez-Pilcher; Christine, Prater; James, Carr

Most frogs are visual predators, but the African clawed frog (Xenopus laevis) uses multimodal sensory pathways (olfaction, visions, lateral line) to detect and capture prey. The relative contribution of these sensory modalities to prey capture in this species is unknown. Our goal was to eliminate olfactory cues and determine how this affected prey capture in this species. We used a three by two
factorial design, with the presence/absence of food, olfactory cues, and before/after food as
independent variables. A total of sixteen juveniles were set up individually into tanks, and each
monitored for 2 hr time periods. Each animal was tested twice for a total sample size of eight per
treatment level. During the first hour, the video recorded baseline behavior, and the second hour was
dedicated to presence/absence of prey (liver). The prey we used was a precisely measured amount of
chicken liver (0.6 g) that was placed in the cages. Using the same 2 hr set up, we changed the
variables, (0.6 g) chicken liver was placed in a sealed clear container to ensure the frogs were able to
see, but not smell, the liver. The video recordings of the juveniles’ behavior are still being analyzed
and scored through JWWatcher. The results will be presented at the upcoming conference.

38. ESTABLISHING TYPE II DIABETES MOUSE MODEL

Presenter(s): Greer, Hannah
Authors: Shen, Leslie; Tomison, Michael

Diabetes Mellitus (DM) is a chronic disease associated with high blood glucose levels which occurs
either due to lack of insulin (type I diabetes, TID) or resistance of body’s cells to utilize insulin (type II
diabetes, TIID). Diabetes affects 9.3% of the United States population. Previously, it has been
reported that oxidative stress plays a major role in the pathogenesis and development of
complications of both types of DM. We are interested in determining the beneficial effects of anti-
oxidants, specifically combination of green tea and tocotrienol, on TIID related complications. To test
this, our first goal was to establish a TIID animal model in our lab. Male C57BL/6J mice were fed a
low fat diet (LFD) or high fat diet (HFD) containing 10% energy or 65% energy from fat, respectively,
for 12 weeks. To determine impaired glucose tolerance and insulin resistance, intra peritoneal
glucose tolerance test (IPGTT) and intra peritoneal insulin tolerance test (IPITT) was performed,
respectively. At the end of the study, body weight was measured and pancreas was collected for
immunostaining. Body weight was significantly higher in the HFD compared to the LFD. Additionally,
the HFD had impaired glucose tolerance and insulin resistant. Immunostaining the pancreas for
insulin (marker for islet cells) and glucagon (marker for alpha cells) revealed no major difference in
HFD and LFD suggesting early stage TIID has no major impact on pancreas morphology. Collectively,
our data suggests C57BL/6J mice fed a HFD for 12 weeks can be used as model to study TIID.

39. THE INFLUENCE OF ETHNICITY AND GENDER ON CONDITIONED PAIN MODULATION AMONG
YOUNG HEALTHY AFRICAN AMERICANS AND NON-HISPANIC WHITES

Presenter(s): Griffin, Cierra
Authors: Griffin, Cierra

Conditioned pain modulation is a laboratory test to examine the pain inhibition ability of the subject.
Research suggests that reduced ability of pain inhibition, as tested by conditioned pain modulation,
may serve as risk factor for chronic pain conditions. There is little to no evidence that shows the
influence of ethnicity and gender on conditioned pain modulation. This study examined the influence
of ethnicity and gender on pain modulation among young (18-30 yrs old), healthy African Americans
and non-Hispanic Whites. Fifteen men (four African Americans and eleven non-Hispanic whites) and
twenty-three women (fourteen African Americans and twenty-four non-Hispanic whites) were
assessed on pain modulation using a conditioned pain modulation test, where changes in baseline
pain ratings to electrical stimulus to the ankle were determined in comparison to during and after
concurrent application of pressure stimulus on the finger. The change scores, reflecting an ability to
modulate pain, were then compared by ethnicity and gender. As expected, pain ratings were
substantially reduced during and after concurrent application of pressure stimulus compared to
baseline. Mean change scores were generally comparable among African American men, African
American women, non-Hispanic White men, and non-Hispanic White women. These results suggest
that there is no difference of ability to modulate pain between the four groups. We are still collecting
data for this study, and plan to present complete findings in the conference.
40. AN ANNOTATED CHECKLIST AND CATALOGUE OF THE NATIVE BEE SPECIES OCCURRING ON THE SOUTHERN HIGH PLAINS IN WESTERN TEXAS

**Presenter(s): Gutierrez, Wilber**

**Authors: Gutierrez, Wilber; Miranda, Roberto; Longing, Scott, Discua, Samuel**

Pollination is a major ecosystem service provided by insects, and among insects bees are the most important pollinators. Bees (Hymenoptera: Apoidea: Anthophila) pollinate 80% of all flowering plants worldwide, helping to maintain native plant communities and contribute to agricultural production. Loss of natural habitat, excessive use of pesticides, invasive species, diseases and climate change are causing managed and wild bee populations to decline worldwide. The loss of bee populations puts at risk pollination services in natural ecosystems, native plant diversity, and agricultural production. The state of Texas has an estimated 900 bee species; However, the number of species occurring in western Texas, and potential changes in biodiversity attributed to widespread conversion of native lands to agriculture, remains unclear. To better understand what bee species occur in the region and how land use has affected their distribution, it is necessary to compare historical museum records with recent survey collections. The objective of this study is to catalogue and develop an annotated checklist of the bee species occurring on the Southern High Plains. Historical collections of bees from the Museum of Texas Tech University will be compared to collections from recent surveys. A photographic library of bee species and morphological attributes will be built and uploaded on a digital database. Finally, we will determine if potential differences in historical and recent bee diversity is related to land-use change on the Southern high plains.

41. DIASTOLIC FUNCTION IN RELATION TO REGIONAL ADIPOSITY IN WOMEN

**Presenter(s): Hadri, Omar**

**Authors: Hadri, Omar; Gonzales, Ph.D, Joaquin U.**

BACKGROUND: It has been known that women have lower diastolic function than men due to their smaller sized hearts. Few studies have directly examined if diastolic function is also affected by adiposity in women. PURPOSE: The purpose of this study is to examine the relationship between regional adiposity and diastolic function in women. We hypothesize that diastolic function has an adverse relationship with adipose tissue. METHODS: Twenty-eight middle-aged women (31-45y) and 31 older women (60-80y) were included in this study. Diastolic function was assessed by measuring subendocardial viability ratio (SEVR) using radial artery applanation tonometry. Dual-energy X-ray absorptiometry was used to measure body composition. Regional fat measures (android, arms, trunk, gynoid, legs) were normalized to total fat. RESULTS: Trunk (r=-0.48, p=0.009) and android fat (r=-0.43, p=0.02) were negatively associated with SEVR, while gynoid (r=0.53, p=0.004) and leg fat (r=0.46, p=0.013) were positively associated with SEVR in middle-aged women. Stepwise regression identified gynoid fat as the only independent predictor (r2=0.25, p=0.004) of SEVR among all regional fat measures in middle-aged women. Interestingly, no significant relationships between body fat and SEVR were observed in older women. CONCLUSION: These results indicate that middle-aged women with a higher percentage of fat in the gynoid (thigh) region have higher diastolic function. This relationship was age-specific since no associations were found in older women. Our findings warrant future studies to examine the basic mechanisms that underlie our findings.

42. MODEL OF DIAGNOSTIC DIAPER WITH ACID-BASE VIRAL INDICATOR

**Presenter(s): Harris, Jennifer**

**Authors: Harris, Jennifer**

The purpose of this research is to propose a model of a diagnostic diaper than can identify the presence of diseases using urine. The diaper will have a visual indicator that changes color when the disease is present. In order to do this, the research is built upon the "Personal care compositions with color changing indicators" developed by Sabnis et al. (2006); their materials identifies when the diaper is wet by a change in the pH of the environment, thus triggering a color change in the material.
However, instead of looking for urine, the acid-base indicator will be inspecting specific pH levels that correspond with common diseases. Methyl red has been chosen due to its narrow range of 4.4-6.2; an acidic substance will turn red, while a basic substance will turn yellow. Preliminary tests have been conducted with cultured E. coli, but the ultimate goal is for the indicator to work with other diseases such as Vibrio cholerae, Campylobacter jejuni, or even Salmonella typhimurium. These diseases are transmitted by bodily fluids, and are usually accompanied with symptoms such as diarrhea. The acid-base indicator has been proven to work correctly with a urine-like media, which is more basic than the identified diseases. Preliminary results also show that E. coli can be detected by this indicator, and when the two are combined, results show that the pH of the E. coli make the indicator lose color.

43. VIABLE ANTIBIOTIC RESISTANT BACTERIA ARE DISSEMINATED ON AIRBORNE PARTICULATE MATTER FROM CATTLE FEED YARDS

**Presenter(s): Hensley, Loren**

**Authors: Hensley, Loren; Thompson, Kelsey; Wooten, Kimberly; Smith, Philip; Mayer, Gregory**

Increasing incidence of antibiotic resistance is cause for concern; without effective antibiotics humans could quickly lose the war on bacterial disease. Antibiotic resistant bacteria are generated in settings where antibiotics are used in large quantities, such as hospitals, veterinary clinics, and animal production facilities. Some estimates suggest that the amount of antibiotics used in animal production industries constitutes as much as 80% of total North American antibiotic usage. Recently, our group described aerial dissemination of antibiotics, bacteria, and antibiotic resistance genes on airborne particulate matter (PM) emanating from cattle feedlots. Because the previous study utilized a sequencing-based approach, results were unable to confirm viability of the fugitive bacteria. Given the robust population diversity observed in the previous study, we hypothesized that PM could harbor viable bacteria and that members of this population would exhibit antibiotic resistance. Here we show that bacteria associated with feedlot PM are indeed viable in laboratory culture, including several isolates that are antibiotic resistant. PM samples isolated on sterile filters placed downwind of feed yards were cultured in Luria broth and trpticase soy broth with and without tetracycline at 50ug/ml. Viable bacteria, that we were able to culture, included a subset of those observed by sequencing. Tetracycline resistant isolates were observed on tripicase soy agar plates using the disc diffusion method. Isolates were identified by analysis of 16S rRNA gene variable regions. This study validates previous sequencing-based investigations, and provides proof of principle that viable antibiotic resistant bacteria are emitted from feedlots via airborne PM.

44. THE ROLE OF PHYSICAL ACTIVITY IN THE RELATIONSHIP BETWEEN AGE AND PAIN CONDITIONS: AN INNOVATIVE HYPOTHESIS FROM A LITERATURE REVIEW.

**Presenter(s): Heredia, Carla**

**Authors: Heredia, Carla**

It is known that older adults are at a greater risk of chronic pain conditions. It is currently unclear; however, what could be responsible for this association between age and pain conditions. Based on extensive review of the relevant literature, we attempt to propose an innovative hypothesis that may help us understand potential factor for the association. The literature indicates that compared with younger age groups, older populations tend to engage in much less physical activity on average. It has been suggested that efficiency of pain modulatory processing within the central nervous system may be linked to development of chronic pain conditions, and there is growing evidence that 1) older adults typically exhibit a reduced efficiency of central pain modulatory processing compared to younger counterparts, and 2) physically active individuals show an increased efficiency of central pain modulatory processing compared to less active individuals. Together, these lines of research collectively lead to an innovative hypothesis that older adults may be at a greater risk of chronic pain conditions due to their reduced efficiency of central pain modulatory processing via their lower
physical activity levels compared to younger counterparts. Empirical research is warranted in the future to test our hypothesis.

45. SENSITIVITY OF COMMON VASTUS LATERALIS ULTRASOUND VARIABLES FOR EXAMINING AGE-RELATED DIFFERENCES

Presenter(s): Hernandez, Jennah
Authors: Hernandez, Jennah; Stock, Matt; Mota, Jacob

Ultrasoundography is frequently used in neuromuscular research to examine muscle architecture and function. In particular, measures of muscle thickness and echo intensity are often utilized to assess muscle quantity and quality, respectively. The purpose of this study was to examine differences in vastus lateralis muscle thickness versus echo intensity across the lifespan. Ultrasound images were taken of eight boys (mean ± SD age = 12 ± 2 years), eight young men (age = 26 ± 3 years), and seven old men (age = 71 ± 4 years). Muscle thickness (cm) was defined as the distance between the deep and superficial aponeuroses. Echo intensity (au) was defined as the mean of the histogram using ImageJ’s grayscale and rectangle functions. Separate one-way analyses of variance were used to examine mean differences among the age groups. There were no significant differences in muscle thickness (boys = 1.92 cm, young men = 2.13 cm, old men = 1.64 cm [F = 2.795, p = 0.085]). However, the analysis of echo intensity showed significant mean differences (boys = 68.1 au, young men = 47.5 au, old men = 65.5 au [F = 12.654, p &lt; 0.001]). Tukey post hoc analyses demonstrated significantly lower echo intensity for the young men compared to both the boys and old men. Although additional studies with larger sample sizes are needed to confirm these findings, echo intensity may be a more sensitive variable than muscle thickness for examining age-related differences in vastus lateralis muscle architecture.

46. SORGHUM SILAGE: A VIABLE ALTERNATIVE TO CORN SILAGE?

Presenter(s): Hoffman, Amanda
Authors: Hoffman, Amanda; Campanili, Pedro; Sarturi, Jhones, Trojan, Sara

Water for crop irrigation has been declining to critically low levels in areas of the Texas High Plains. Alternative roughage sources to corn silage for feeding cattle that are high-quality, economically viable, and water efficient must be explored. Forage sorghums may be a viable alternative as they utilize water more efficiently than corn silage. Improved varieties of forage sorghums have increased nutrient digestibility, however, the feeding value of new varieties in finishing cattle diets has not been well established. The objective of this experiment was to compare total digestive tract and ruminal nutrient digestion of corn and sorghum silages when included (10 or 20%, DM basis) in cattle finishing diets. Ruminally cannulated steers (6) were used to evaluate in situ nutrient degradability. Total tract apparent digestibility was measured using acid insoluble ash as the internal feed marker, collection of feces (twice-daily, during 5 d), and collection of diets and refusals. Nutrients consumed were corrected for unconsumed feed. Samples were analyzed for fiber fractions (acid and neutral detergent fibers, and hemicellulose). In vitro ruminal methane was also evaluated for all diets. The expected outcome of this experiment is to have a better understanding of the nutrient value of a new forage sorghum variety, compared with corn silage, when included in diets for finishing cattle.

47. THE EFFECTS AND PATHWAY OF TIGECYCLINE IN REDUCING ETHANOL CONSUMPTION

Presenter(s): Holmes, Ashley
Authors: Holmes, Ashley; Martinez, Joseph; Bergeson, Susan

The gastrointestinal microbiota varies from person to person and can contribute to changes in mood, cognition, and chronic pain as well as overall health. Previous data from our lab has shown that the tetracycline derivative, tigecycline is effective at reducing free-choice binge ethanol consumption in mice. We hypothesize that the effects of tigecycline on ethanol drinking are mediated centrally through neuromodulatory effects. The objective of this experiment is to examine if tigecycline’s
Effects are mediated through the gut microbiota; specifically, we will observe if tigecycline’s antibiotic properties contribute in the defense against ethanol’s effects via neuroimmunomodulatory pathways and/or microglial activation. To test this hypothesis, we administered an antibiotic cocktail to partially sterilize the gastrointestinal tracts of mice. These mice were then subjected to a Drinking-In-the-Dark (DID) paradigm of binge drinking to measure the amounts of ethanol and water consumed. Fecal matter was extracted from the mice, and the DNA and RNA will be sequenced to determine the level of sterilization achieved and to catalog the remaining microbiota. If ethanol consumption differences are found, we expect to be able to determine if there is a difference in bacterial species found in the microbiota of the mice groups. We will also be examining any gender differences in microbiota and tigecycline efficacy as well. We will examine the brains of these animals for genetic and epigenetic changes as well as microglia changes in an effort to elucidate the mechanism of action of tigecycline.

48. CHANGES IN BODY COMPOSITION AFTER EXERCISE IN HEALTHY AND OBESE FEMALES: PRELIMINARY DATA

**Presenter(s): Hull, Amara**

**Authors: Hull, Amara; Larumbe-Zabala, Eneko; Fernandez-del-Valle, Maria**

According to the Centers for Disease Control and Prevention, 34.9% or 78.6 million of U.S. adults are obese. It is important to not only look at body mass index (BMI) and/or body weight (BW) when classifying those with obesity. Despite it is more accurate to use other indexes such as lean body mass (LBM) or relative body fat (%BF), BW or BMI are still used to address intervention-related changes. It is well known that exercise has an effect on body composition (BC), increasing LBM and decreasing %BF with no significant effects on BW or BMI. We aimed to study the changes in BC in a group of normal BMI females (22.72 years, 59.67.8 kg) compared to obese females (25.12.2 years, 94.812.6 kg). Methods: The sample consisted of 6 normal BMI females and 3 obese females. Physical fitness was assessed before and after the exercise program by means of a VO2max test to determine cardiopulmonary fitness, strength fitness testing using 1 maximum repetition (1-RM), dual-energy x-ray absorptiometry (DXA) to obtain BC, and fat distribution was also assessed using Magnetic Resonance Imaging (MRI). Results: While BMI and BW was reduced in healthy BMI participants, obese subjects showed an increase (Intervention: BW= -.14 vs .65kg; BMI= -.105 vs .36kg/m2, respectively). However, when looking at BC obese gained LBM (LBM= .87kg) and reduced %BF (%BF = -.05) similarly to the healthy group. Conclusions: Our results support that BMI and BW should not be used as the only indicators to assess intervention-related changes in BC.

49. INFLUENCE OF PHYSICAL FITNESS LEVELS IN CIRCULATING IRISIN

**Presenter(s): Hurtado, Amy**

**Authors: Hurtado, Amy; Fernandez del-Valle, Maria; Kloiber, Shelby, Short, Matthew; Chung, Eunhee**

The recently discovered protein hormone irisin has been shown to increase the mitochondrial density of adipose tissue, a process known as browning. As irisin was found to improve metabolism, it is thought that it may help prevent and/or treat overweight, obesity, and other conditions associated with obesity. PURPOSE: To investigate the association of physical fitness (PF) levels with circulatory levels of irisin. METHODS: Our sample was comprised of a total of 32 male and female volunteers with 21.3 ± 2.2 years, 65.2 ± 8.8 kg of body weight, 22.2 ± 1.99 kg/m2 BMI. The subjects were taken through a series of tests: a cardiopulmonary maximal fitness test on a treadmill, a one repetition maximum strength test, and DXA to assess their PF levels. To study the irisin levels, blood was taken from the subject via venous puncture. RESULTS: We found large correlations between irisin levels and maximal oxygen uptake (VO2max) (r= -.59, p=0.025) and lean body mass (LBM) (r= -.41, p=140) in males (n=14). However, we did not obtain the same results in females. In addition, percentage of body fat was not correlated with irisin (r=0.04 and r= -.04 in male and female, respectively). CONCLUSION: Irisin levels in males seem to be positively associated to increased fat content, negatively associated to increased PF (VO2max and LBM), and these results were different.
for females. Therefore, the secretion mechanisms of this hormone should be studied on a greater sample size, with more varied body composition profiles, and taking into account sex differences.

50. EXERCISE BEFORE AND DURING PREGNANCY DOES NOT ALTER MYOSIN HEAVY CHAIN ISOFORMS IN PREGNANT MICE

Presenter(s): Jacobo, Unique

Authors: Jacobo, A. Unique; Grue, Katherine A.; Joiner, Hayli E., Chung, Eunhee

The myosin heavy chain isoforms (Beta-MHC and Alpha-MHC) determine shortening velocity and power output properties of the heart. There are two types of cardiac hypertrophy, pathological and physiological. Pathological cardiac hypertrophy is often accompanied by re-expression of Beta-MHC with decreases in kinetic properties of the heart. High fat diet is known to lead to cardiac dysfunction seen through the expression of Beta-MHC in the heart. However, little is known about the effects of high fat diet and exercises during pregnancy on MHC isoform content. The purpose of this study is to determine whether exercise in combination with high fat diet consumption before and during pregnancy would alter MHC isoforms. Our model consisted of C57BL/6 virgin female mice whom were first split into high fat diet (HFD, 45% kcal) and low fat diet (LFD 10% kcal) groups. Four weeks before pregnancy initiation, the HFD mice were split into two sub groups, sedentary (HFD) or exercised (HFD+Ex). The HFD+Ex participated in voluntary wheel running through gestation. All mice were sacrificed at 19 days gestation. The MHC isoform content of ventricular homogenates was determined using a 6% SDS-Polyacrylamide gel electrophoresis. We found, there were no differences in MHC isoform expression between the HFD, HFD+Ex group, and the LFD animals. We conclude that exercise before and during pregnancy does not alter MHC isoform content in pregnant mice fed by high fat diet.

51. POOR PHYSICAL ACTIVITY LEVELS AND PHYSICAL FITNESS IN ADOLESCENTS WITH ANOREXIA AFTER HOSPITALIZATION

Presenter(s): Jeffery, David

Authors: Jeffery, David; Fernandez-del-Valle, Maria; Perez-Ruiz, Margarita, Graell, Montserrat; Larumbe-Zabala, Eneko

Physical activity (PA) levels in anorexia nervosa (AN) have been controversial, and inconsistent results have been reported among studies. There are no standardized guidelines for PA levels and exercise prescription in AN patients. Consequently, patients present poor physical fitness (PF) that persists after weight recovery. PURPOSE: To study spontaneous PA and the PF status in a group of adolescents with AN after hospitalization. METHODS: An Actigraph GTM1 monitor was used to assess PA levels in 74 AN patients (mean age = 13.5 years, SD=1.2). Cardio-respiratory parameters for aerobic and anaerobic capacity (maximal oxygen consumption [VO2max], % of VO2max at first and second ventilatory thresholds [VT1, and VT2]), and maximal strength assessed were compared with the PF levels. RESULTS: Values of moderate to vigorous PA (MVPA) levels were 44.5 min/day (SD = 22.5), and resulted different (t[73]=5.91 p<0.001) from the recommendations. Only 21.62% of the AN patients met the MVPA criteria. Functional capacity was affected: 75.68% of the patients presented reduced aerobic capacity (VT1), (t[73]=5.0 p&l t;0.001); 82.4% presented reduced anaerobic capacity (VT2), (t[49]=2.79, p=0.004); among them 32.4% (n=24) did not reach VT2, and 50% (n=37) did not meet the criteria for a healthy VT2. Mean relative strength was significantly below the normal threshold for healthy population on bench press (1.44), (t[73]=15.5, p&l t;0.001). CONCLUSIONS: Our findings show that AN PF levels are not fully recovered, and PA levels do not meet the recommendations. This suggests that exercise prescription might be critical for an adequate PF recovery in AN patients.
52. INVESTIGATING DUAL-SPECIES INTERACTIONS IN AN IN VITRO WOUND ENVIRONMENT

**Presenter(s): Johnson, Justin**

**Authors:** Johnson, Justin; Gabrilska, Rebecca; Rumbaugh, Kendra

Chronic, non-healing wounds are an increasingly relevant medical issue, affecting upwards of 6.5 million patients a year in the US alone and burdening our economy with treatment costs estimated to be as high as 25 billion dollars in 2010. Chronic wounds are often polymicrobial, whereby two or more species of bacteria can interact cooperatively, antagonistically or synergistically within the same environment. However, very little is understood about the nature of these interactions, or whether they influence the severity of the infection. One reason for this deficiency is the difficulty of growing multiple bacteria together in vitro. Therefore, in vitro models that simulate the chronic wound environment and support polymicrobial growth are needed. Thus, we produced a novel in vitro polymicrobial 'wound-like' assay in order to investigate the interactions between several opportunistic pathogens that are commonly found in chronic wounds. Utilizing this assay, our goal is to uncover and characterize interactions between bacteria in wound infections and determine the role of these interactions in pathogenesis, with the hope that new treatment options for debilitating chronic wounds may be uncovered. To date, we have uncovered an antagonistic relationship between Pseudomonas aeruginosa and Acinetobacter baumannii in both aqueous and semi-solid environments. Through co-culture studies of morphology, phenotypic variation and biofilm production, we are beginning to understand the antagonistic relationship between these two opportunistic pathogens commonly isolated from clinical chronic wound samples, which could make them more difficult to treat in human wounds.

53. MATERNAL EXERCISE ACTIVATES GENES ASSOCIATED WITH MITOCHONDRIAL BIOGENESIS IN FETAL MYOCARDIUM OF MOUSE

**Presenter(s): Joiner, Hayli**

**Authors:** Joiner, Hayli; Skelton, Tracer; Looten, Kalli, Chung, Eunhee

Maternal exercise during pregnancy has been shown to improve long-term metabolic health on offspring in later life. Mitochondria are the critical site of metabolism, and are inherited by maternal origin. However, the effects of maternal exercise during pregnancy on fetal mitochondrial biogenesis are not well understood. **PURPOSE:** To test whether maternal exercise can activate genes associated with mitochondrial biogenesis in the fetal heart. **METHODS:** Female mice were divided into sedentary and exercise groups. The mice in the exercise group were exposed to voluntary cage-wheel from gestational day 1 through 17, at which time they were sacrificed. Litter size and individual fetal weights were taken when pregnant dams were sacrificed. All fetuses were sexed and two to three hearts from same sex within the group were pooled to study gene expression. **RESULTS:** Exercise dams ran an average of 7.22 ± 0.41km/day until mid-pregnancy and gradually decreased to low levels through the remainder of gestation. There were no significant differences in litter size, sex distribution, and average fetal body weight per litter between sedentary and exercise dams. Genes associated with mitochondrial biogenesis, including Ppargc1a (peroxisome proliferator-activated receptor gamma, coactivator 1 alpha), Nrf1 (nuclear respiratory factor-1), and Nrf2 (nuclear respiratory factor-2) were significantly upregulated in fetuses from exercise dams. **CONCLUSION:** Although total kilometers run per day (km/day) were significantly decreased in later stage of pregnancy, maternal exercise initiated at day 1 of gestation significantly increased genes associated with mitochondria biogenesis, indicating that maternal exercise enhances mitochondrial biogenesis and mitochondrial function.
54. WEED MANAGEMENT WITH ENGENIA IN BOLLGARD II XTENDFLEX COTTON

**Presenter(s):** Keeling, Emily  
**Authors:** Keeling, Emily; Koonce, Austin; Dotray, Peter

Engenia is a new dicamba formulation under development by BASF for use in Bollgard II Xtendflex cotton, which could improve control of a wide range of annual and perennial weeds. Resistant Palmer amaranth (Amaranthus palmeri), ivyleaf morningglory (Ipomoea hederacaea), woollyleaf bursage (Ambrosia grayi), kochia (Kochia scoparia), field bindweed (Convolvulus arvensis), and Texas blueweed (Helianthus ciliaris) could be more effectively controlled with Engenia when applied post emergence (POST) compared to Roundup PowerMax (RUPM) applied alone. Field studies were conducted in 2015 at Lubbock, TX to evaluate Palmer amaranth, devil's-claw, and Russian thistle control with various applications of Engenia and other residual herbicides, including Prowl H2O and Outlook. The objectives of these studies were to evaluate Palmer amaranth, Russian thistle, and devil's-claw control with Engenia applied pre- or postemergence in Bollgard II Xtendflex cotton. Efficacy of Prowl H2O applied preplant incorporated (PPI) or preemergence (PRE) and Outlook (POST) with Engenia for residual weed control was determined. Field trials compared Prowl alone and Prowl + Engenia (PRE) followed by Roundup PowerMax (RUPM) alone, RUPM + Engenia + Outlook mid-postemergence (MPOST). POST only treatments include RUPM + Outlook, RUPM + Outlook + Engenia, RUPM + Engenia, or RUPM only. Treatments were applied using a CO2-pressurized backpack sprayer calibrated to deliver 15 gallons per acre. Percentage of weed control was estimated visually 17-21 and 60 days after planting (DAP).

55. THE EFFECTS OF ZINC SUPPLEMENTATION ON FEEDLOT PERFORMANCE, CARCASS CHARACTERISTICS, AND BLOOD METABOLITES OF FINISHING STEERS

**Presenter(s):** Kennedy, Kleg  
**Authors:** Kennedy, Kleg; Thompson, Logan; Burson, Clay, Baggerman, Jessica; Bernhard, Bryan

The objective of our study was to observe the effects of zinc on feedlot performance, carcass characteristics, and blood metabolites during the finishing phase of feedlot steers. Crossbred steers (n=32; 442±17 kg) were blocked by BW and organized in a completely randomized block design (8 pens; 4 pens/treatment; 4 steers/pen). Treatments included: 1) 0 g of additional zinc; control (Con) or 2) 1 g/hd/d of additional zinc (Zn) added to the finishing diet. Ractopamine hydrochloride (300 mg/hd/d) was administered during the final 28 days of the feeding period. Body weights were measured on d 0, 42, 79, 107, and 111. Blood was collected from a subset of steers (2 steers/pen; n=16) on d 0, 42, 79, and 107 to determine non-esterified fatty acid (NEFA) and serum urea nitrogen (SUN) concentrations. Overall BW and DMI were not affected by treatment (P>0.20). Zinc supplementation caused an improvement in ADG during the beta-agonist feeding period (P=0.02). Similarly, Zn steers were more efficient than Con steers during the beta-agonist feeding period (P=0.03). Over the entire study, ADG and G:F numerically favored the Zn steers, but were not statistically different (P greater or equal to 0.13). Blood metabolite analyses resulted in Zn steers displaying a greater serum NEFA concentration than Con steers (P less than 0.01). Treatment did not affect SUN (P=0.26), but did increase for both treatments from d 0 to 42 (P=0.01) and d 79 to 107 (P=0.01). The results of this study suggest that zinc supplementation increases the performance and efficiency of finishing cattle during the beta-agonist feeding period.

56. IDENTIFYING VESICULAR GLUTAMATE TRANSPORTERS IN THE BRAIN OF THE AFRICAN CLAWED FROG XENOPUS LAEVIS

**Presenter(s):** Le, Christopher  
**Authors:** Le, Christopher; Carr, James

The peptide corticotropin releasing factor (CRF) is produced by neurons located in sub-cortical visual pathways, especially the optic tectum. Glutamate is the main neurotransmitter that relays information from retinal cells to the optic tectum. Since CRF has a potential role in regulating visually triggered
behavior during stress, we were intrigued as to whether tectal CRF neurons are regulated by glutamate transporters. We attempted for the first time to identify the presence and types of vesicular glutamate (vGLUT) transporters in visual pathways of the African Clawed Frog Xenopus laevis through quantitative real-time PCR (qRT-PCR) and immunohistochemical (IHC) techniques to locate the vGLUT1 protein. We hypothesized that the optic tectum will have the most vGLUT transporters compared to other brain regions. Using an anti-vGLUT1 transporter antibody, we are currently developing an IHC method to detect this transporter in the optic tectum. Furthermore, our qRT-PCR results show that the optic tectum contained the most cDNA expressing vGLUT1 compared to the other brain regions. This is the first attempt by anyone to examine the interaction between vGLUT transporters and CRF neurons in the visual system. We anticipate future results will further our knowledge of the adverse relationship between visually triggered fear and stress.

57. PRELIMINARY TRIALS OF A NEW HUMAN SEMEN THAWING DEVICE

**Presenter(s):** Littleton, Katelyn  
**Authors:** Littleton, Katelyn; Bell, Leah; Rahman, Mahnaz, Penrose, Lindsey; Prien, Samuel

**Introduction:** 1 in 7 couples in the U.S. will seek fertility treatment, which often involves the use of frozen semen. The most common procedure for thawing semen is to place samples in a water bath at 37 °C. In order for more clinics to have the ability to conveniently thaw semen without a water bath, a device was developed that distributes heat from a hot plate uniformly around the sample.

Effectiveness of the device was analyzed in comparison to other common thaw methods. Materials and Methods: 10 semen samples from volunteers were divided into 4 equal aliquots and frozen using standard procedures. After being held for a short period, the samples were thawed using four treatments: 37 °C water bath, 37 °C dry heat block, 42 °C hot plate, and new device placed on the same hot plate. Measurements were taken on each sample with a computer assisted semen analyzer at the time of thaw, after processing the samples, at 1 hour, and at 3 hours. Results: The traditional water bath out-performed the other treatments for motile cell recovery and activity prior to 3 hours (P less than 0.03). Interestingly, the new device appeared to maintain motility through the 3 hour measurements better than any other thaw method (P less than 0.02). Discussion: The new device may stabilize semen survival and performance over time, even though it did not initially match the water bath, making it a promising alternative for some circumstances. Future experiments are planned using a non-electricity heating source.

58. THE USE OF PIGMENT EPITHELIUM-DERIVED FACTOR (PEDF) TO ANALYZE ANDROGEN RECEPTOR RESPONSE IN PROSTATE CANCER CELLS

**Presenter(s):** Loy, Sydney  
**Authors:** Loy, Sydney; Jarvis, Courtney; Nelius, Thomas, Filleur, Stephanie

Prostate cancer is the second most common cancer among American males. If left unchecked, prostate cancer metastasizes becoming virtually incurable. Our laboratory focuses on prostate cancer inhibition by using the endogenous molecule, Pigment Epithelium-Derived Factor (PEDF) which is present in healthy prostate gland tissue. In prostate cancer, PEDF disappears subsequently leading to increased angiogenesis and uncontrolled proliferation of the tumor cells. Our lab has shown that reintroducing PEDF in prostate cancer cells inhibits tumor growth in vivo. We have identified four molecular mechanisms involved in PEDF growth inhibition: (i) stimulation of death of tumor endothelial cells, leading to reduced tumoral angiogenesis and delayed growth; (ii) decreased proliferation of prostate cancer cells; (iii) induction of tumor cell differentiation towards a less malignant phenotype; and (iv) effective host inflammatory immune response stimulation. Our preliminary data suggests that PEDF up-regulates the expression of the androgen receptor in prostate cancer cells. The objective of this project will be to validate androgen receptor expression levels in response to PEDF. Therefore, we will treat TRAMP C1 prostate cancer cell lines 3D7 and E6 with various concentrations of synthetic androgen, R1881. After 48 hours the protein is extracted from the plates. A Western Blot is then performed to measure the expression levels of the androgen
receptor and the B-actin housekeeping. Additionally, an immunofluorescence assay will locate in the cells the androgen receptor. This study will help to expand our current knowledge of PEDFs role in androgen receptor regulation in hopes of finding therapeutic techniques for prostate cancer.

59. EFFECTS OF PHYSICAL ACTIVITY AND DIETARY HABITS ON CARDIAC ADIPOSY: METHODS AND PRELIMINARY DATA

Presenter(s): Luna, Isabella

Authors: Larumbe-Zabala, Eneko; Fernandez-del-Valle, Maria; Kloiber, Shelby, Hill, Jason; Mitra, Sunanda

There is no question that obesity is very prevalent in our society, in white females alone 63.2% of the population is considered to be overweight or obese. Obesity adverse effects on cardiovascular structure and function can lead to further complications such as heart failure, coronary heart disease, sudden cardiac death, or atrial fibrillation. Purpose: To develop a method to study the association between cardiac ectopic fat, physical activity (PA) and dietary habits in a group of obese women. Methods: Three subjects (aged 22.6-26.6 years) compressed our pilot sample. PA levels were assessed using Actical omni-directional accelerometers. Participants had to wear the monitor during a one week period. Diet was evaluated using the automated self-administered 24 hour dietary recall (ASA24), and cardiac fat was measured using Magnetic Resonance Imaging (MRI). Results: Energy intake range was 2435-3145.4 kcal, protein, fat, and carbohydrate intake ranged 68.7-114.4 g/day, 95.5-121.5 g/day, and 292.2-460.4 g/day respectively. PA measurements ranged between 2693-3243.1 steps per day, 61.3-62.4 min at moderate intensity per day, and the energy expenditure ranged between 271.5-342.2 kcal/day. Cardiac fat to heart volume ratio was 1:4.7. Conclusion: The segmentation algorithm coded in MATLAB to separate fat tissue from myocardial tissue developed here will allow us to study cardiac fat volume, and how it relates to changes in PA and dietary habits. Further, this method could be used to assess the effectiveness of interventions in the reduction of this depot that is closely related to the development of cardiovascular disease.

60. BETADINE SOLUTION IS NOT EFFECTIVE IN INHIBITING THE GROWTH OF DIFFERENT GRAM POSITIVE AND GRAM NEGATIVE PATHOGENS IN VITRO

Presenter(s): Luth, Keaton

Authors: Luth, Keaton; Dong, Huy; Tran, Phat, Huynh, Eric; Desai, Akash

Purpose: Injections of intravitreal medications have become routine care in ophthalmology offices throughout the world for the treatment of several retinal diseases. These injections puts the patient at risk for an intraocular infection. The present study was undertaken to measure the effectiveness of Betadine solutions (which is the standard of care for this procedure) in inhibiting the growth of different Gram negative and Gram positive bacteria. Methods: We examined the antimicrobial activity of 2.5%, 5%, and 10% Betadine solutions against different bacteria by both the Agar Diffusion and the Colony Forming Unit (CFU) assays. Results: All the bacteria, except Pseudomonas aeruginosa GFP laboratory strain, using 2.5% Betadine, showed zones of inhibition. At 5 and 10% Betadine concentrations, all the bacteria showed zones of inhibition. However, after measuring the inhibition zones, the disks were tested for live bacteria and only S. aureus and MRSA strains showed no live bacteria at 10% Betadine. The confocal laser microscopy confirmed the CFU results. Conclusions: This study demonstrated the following: 1) the zone of inhibition assay does not give a realistic assessment of the ability of an antimicrobial to kill bacteria; 2) In vitro, 2.5% Betadine is not effective at killing any of the bacterial species associated with post procedure endophthalmitis; 3) 5% Betadine is only effective at killing S. marcescens CI; and 4) 10% Betadine is only effective against S. aureus, MRSA, and S. marcescens strains. A total of 8 different strains were tested.
61. PEDF MODULATORY ACTION ON MACROPHAGES: A NEW WAY TO CURB PROSTATE CANCER

Presenter(s): Martinez-Marin, Dalia

Authors: Martinez-Marin, Dalia; Filleur, Stephanie; Nelius, Thomas

Tumor-associated macrophages have been recognized as cell effectors critical for prostate tumor growth and progression. The molecular interactions between macrophages and prostate tumor cells remain incompletely characterized. Pigment Epithelium-Derived Factor (PEDF) is a secreted factor with anti-angiogenic, anti-tumor, and anti-metastatic activities. Studies investigating PEDF effect on macrophages showed that PEDF induces the recruitment of macrophages in vitro and in the human prostate, and stimulates the polarization of macrophages towards the classically activated pathway. We demonstrate that PEDF modulates the interaction between macrophages and tumor cells through a bi-directional signalling that results in the phagocytosis of tumor cells. We found that PEDF induces the migration of macrophages towards tumor spheroids and reprograms tumor-promoting into tumor-cytotoxic macrophages. In tumor cells-macrophages co-culture, endogenous and exogenous PEDF increases tumor cells phagocytosis through an apoptosis-dependent mechanism, but independently to a direct action of PEDF on tumor cells. ATP5B and PNPLA2, two known receptors for PEDF, were highly expressed in macrophages and up-regulated by PEDF. CD47, a "don't eat me" signal expressed on the surface of tumor cell was down-regulated by PEDF. Inhibiting ATP5B significantly reduced phagocytosis but did not affect macrophage differentiation. Inversely, inhibition of PNPLA2 blocks differentiation but maintains phagocytosis. Phagocytosis induced by CD47 blocking was reverted by angiostatin suggesting that ATP5B is instrumental in phagocytosis. The PEDF-derived N-terminus P18 peptide mimics PEDF's action on macrophages. These findings position PEDF as a "cis-trans" regulator of the molecular interactions between macrophages and prostate tumor cells, and identify PEDF-induced phagocytosis as a novel anti-tumor mechanism.

62. PHYLOGENY OF BATS OF GENUS MONOPHYLLUS. A STUDY OF GENETIC AND MORPHOLOGICAL DIVERGENCE BASED ON MITOCHONDRIAL CYTOCHROME-B GENE.

Presenter(s): Mathew, Marilyn

Authors: Mathew, Marilyn; Bolzan, Dayana P.; Parlos, Julie A., Baker, Robert J.; Phillips, Caleb

The genus Monophyllus is distributed throughout the Caribbean Islands. Two species of Monophyllus are recognized, M. redmani and M. plethodon, and are sympatric in Puerto Rico. Two hypotheses were formed, first that M. plethodon has multiple species and second that there is more than one species of M. redmani; both hypotheses were based by evaluating morphological differences and application of the Morphological Species Concept. Molecular data, generated from the mitochondrial cytochrome-b gene, were used to test if genetic differentiation was congruent with morphological variation. Genetic distance between M. redmani and M. plethodon is approximately 11%. Considering the Genetic Species Concept, analysis of cytochrome-b does not support the hypothesis of more than one species of M. plethodon (genetic distance &lt; 5%). The experimental data generated from analysis of M. redmani suggests that there could be an undescribed species on the island of Puerto Rico (genetic distance &gt; 5%). Genetic distance values of the cytochrome-b gene are compatible with standards used to determine taxonomic status in mammals. Multiple species concepts exist, and not all can be applied. However, application of multiple species concepts provide more confidence in conclusions drawn from the data. Based on available data, there is no indication for the existence of more than three species in the genus Monophyllus. Further research to analyze the cytochrome-b gene, by completing sequencing, is being conducted. In addition, we plan to sequence a nuclear gene which could determine if gene flow is occurring among the two groups classified as M. redmani.
63. INITIAL ANALYSES OF LACTOBACILLI OBTAINED FROM PATIENTS WITH VAGINAL LACTOBACILLOSIS.

**Presenter(s):** Maveddat, Ashley  
**Authors:** Maveddat, Ashley; Mudaliar, Nithya; Hamood, Jane Colmer, Ventolini, Gay; Hamood, Abdul

The lower genital tract of healthy females is commonly inhabited by lactic-acid-producing bacteria. Lactobacillus species comprise of about 70% of the human vaginal microbiota. Lactobacilli protect the urogenital tract from the invasion of bacterial pathogens and possibly prevent urogenital and sexually transmitted diseases. Potential mechanisms through which lactobacilli accomplish these functions include; the production of lactic acid, hydrogen peroxide and bacteriocin which is a proteinaceous substances with antibacterial activity; and the formation of microcolonies that adhere to the vaginal epithelia cells and form a physical barrier that prevents the attachment of bacterial pathogens. Despite their benefits, certain lactobacilli cause a condition termed vaginal lactobacillosis (VL) which is manifested by the production of a profuse white odorless vaginal discharge and vulvar itching. In vaginal wet mounts preparations, lactobacilli obtained from women with VL form extremely long segmented chains. Other than some available theories, the exact mechanism of VL is not known. We hypothesize that lactobacilli associated with VL differ from other lactobacilli in their; morphology, extracellular products, or biofilm development. In this study, we report the initial characterization of lactobacilli obtained from 3 patients with VL. Gram staining revealed the presence of long chains of Gram-negative bacilli. The colony morphology of the purified isolates varied from opaque to semitranslucent. In addition, all three isolates were catalase-negative. Furthermore, Fluorescence in situ hybridization (FISH) revealed that in comparison with standard lactobacilli, the isolates formed partial less-differentiated biofilms. These results suggest that lactobacilli strains obtained from VL vary in potential virulence related phenotypes.

64. FORMULATION OF A NOVEL MEDIUM TO EXAMINE THE EFFECT OF PHYSIOLOGICAL LEVELS OF BLOOD IONS ON THE VIRULENCE OF PSEUDOMONAS AERUGINOSA

**Presenter(s):** Mechref, Farah; Dhruv, Patel  
**Authors:** Mechref, Farah; Patel, Dhruv; Mudaliar, Nithya, Hamood, Abdul

Pseudomonas aeruginosa is a gram negative opportunistic pathogen that causes serious infections in immunocompromised host including; severely burned patients and patients with chronic wounds. Several extracellular virulence factors including elastase and pyocyanin contribute to the extensive tissue damage observed during P. aeruginosa infection. The environments at specific infection sites influence the production of P. aeruginosa virulence factors. In addition, variations within the individual components of that environment influence P. aeruginosa virulence. Within the serum of different patients, the level of different ions including magnesium, calcium, and iron varies. Several previous studies have examined the effect of a single ion or a change in a single ion on P. aeruginosa virulence without considering the physiological level of other ions. We hypothesize that a medium in which the levels of ions parallel their levels in serum is more suitable to examine P. aeruginosa virulence during systemic infection. In this study, we describe the ion supplemented growth medium (ISGM) in which the level of magnesium, calcium, phosphorus and iron parallel their levels in serum. As a source of iron, we supplemented iron storage protein, ferritin. Using transcriptional fusion systems, we showed that the growth in ISGM enhanced the expression of lasB and phz genes throughout the growth cycle of the P. aeruginosa strains PAO1 and PA14. In addition, using enzyme assays we demonstrated that effect of ISGM on the production of lasB and pyocyanin. These results suggest that ISGM is a unique medium that closely mimics the human serum.
65. NEXT-SCIENCE WOUND GEL ALTERS THE EXPRESSION OF WOUND RELATED CYTOKINES

Presenter(s): Meehan, Grace

Authors: Meehan, Grace; Bounds, Kayla; Hamood, Abdul

Chronic wounds such as diabetic foot ulcers, and venous ulcers, affect approximately 6.5 million persons with an estimated $25 billion annual cost. Wound healing occurs through specific overlapping steps that involve different cell types and extracellular matrix protein and are mediated by cytokines and growth factors. We recently described a novel antimicrobial agent, Next Science (NS) that inhibited the growth of different wound pathogens. Our hypothesis is that besides its antimicrobial effect, NS facilitates wound healing through its effect on cytokine production. Using the murine model of wounds, we examined the influence of NS on the level of cytokine expression in full-thickness excision wounds. Tissues were excised from treated and untreated wounds, and total bacterial RNA was isolated. Using quantitative real time PCR, we determined the level of expression of three cytokine genes: CCL20, IL22, and SPP1 at 3 and 7 day post-injury. Ccl-20 recruits skin homing effector memory T- cells and dendritic cells to the inflamed skin while Il22 is involved in keratinocyte proliferation. SPP1 is a mediator of immune cell function/repairs and is expressed in response to wound healing. Injury enhanced the expression of ccl20, IL22, and Spp1. However, in comparison with injured tissues, the level of expression of Spp1 was decreased while that of Ccl-20 was slightly increased in injured/NS treated tissues. These results suggest that treatment of wounded tissues with NS variably influences cytokines expression.

66. GERMINATION RESPONSE OF FOUR TEXAS NATIVE SPECIES TO SMOKE EXPOSURE

Presenter(s): Mikeska, Brady

Authors: Mikeska, Brady J.; Cox, Robert D.

The effects of smoke on seed germination are well known to vary seed growth. Seeds native to several areas of the world, including portions of Australia, South Africa, and California, have been shown to increase germination rate or percent when exposed to smoke from burning vegetation. This effect has not been well studied in grassland areas such as the shortgrass prairie in Texas. The researchers selected three species native to the Southern High Plains and tested their germination response to smoke exposure. The species were: Mexican buckeye (Ungnadia speciosa), lemon mint (Monarda citriodora), and Plains coreopsis (Coreopsis tinctoria). These species represent culturally and economically native species in the region. The researchers found both responsive and non-responsive species. Responsive species were either stimulated or inhibited by the smoke, but not both. This information could aid in predicting species response to wildfire. It should also be useful for those attempting to restore these species to their native habitat.

67. REDUCTIVE SONOCHEMICAL SYNTHESIS OF SUPERPARAMAGNETIC NANOMATERIALS

Presenter(s): Miller, Amanda

Authors: Miller, Amanda; Casadonte, Dominick

We report a study of the sonochemical synthesis of superparamagnetic nanoparticles (SPMNs) using metal salts and lithium naphthalide as the reducing agent. Sonochemistry is the application of high-intensity ultrasound to drive reactions by acoustic cavitation involving the formation, growth, and high-energy implosion of bubbles in solution. The temperatures and collapse times involved during cavitation do not allow formation of particles of sizes greater than a few nanometers. Consequently, the resulting magnetic materials are superparamagnetic in their behavior. The sonochemically-prepared SPMNs are intimately mixed at the atomic level. This reduces the potential for erosion or exfoliation, making the synthesis of these SPMNPs “green.” This study is primarily concerned with the synthesis of SmCo5, MnBi, and Nd2Fe14B nanoparticles. Because of their superparamagnetic property, the SPMNs can be effectively inductively heated to induce cell lysing or cell death. In essence, we would like to explore the question of how to initiate specified cell death without resulting in damage to surrounding host cells and tissue. If we can respond to this question effectively, we
may lead the way to a future in which cancer, microbial infections, and other parasitic conditions are treatable via target-specific agents like SPMNs. The nanomaterial may also be useful in the sterilization of surgical or related instruments in hospitals or in third world clinics, because they provide a way to reach significantly high temperatures without an external energy source. Other applications include water purification, topical wound sterilization, and an alternative to surgical methods or chemotherapy in eradicating cancerous cells.

68. HABITAT ASSOCIATIONS OF A JERUSALEM CRICKET (STENOPELMATUS MONAHANSENSIS) AT THE MONAHANS SAND DUNES IN WESTERN TEXAS

**Presenter(s): Miranda-Gomez, Roberto**

**Authors: Miranda-Gomez, Roberto; Gutierrez, Wilber; Longing, Scott, Discua, Samuel**

The Monahans sand dunes in western Texas are home to a unique diversity of arthropods and other animals. The Jerusalem cricket (Stenopelmatus monahansensis) is an endemic species known to occur within this dune system. Changes to groundwater and plant communities on the dunes are potential threats to this species. The objective of this study is to determine habitat associations of S. monahansensis across different types of vegetation and dune structure. In June 2014, a total of 18, 20 meter transects were established in six different types of vegetation and dune structure: coppice dunes, low shin oak (Quercus havardii), mixed vegetation, open depositional dunes, panic grass (Panicum havardii) dominant, and remnant seeps. In each transect, 5 pitfall traps spaced evenly were used to collect S. monahanensis. Pitfall trap captures from each transect were collected monthly from June to August 2014. Data will be analyzed as a randomized complete block with repeated measures design. Results from this study will help determine habitat associations of S. monahansensis and data will be subsequently used to estimate the potential habitat of the cricket based on vegetation structure.

69. CD47 DOWN-REGULATION BY PEDF: A NEW MEANS OF INDUCING TUMOR CELL PHAGOCYTOSIS IN VITRO

**Presenter(s): Mittal, Nitish**

**Authors: Mittal, Nitish; Martinez-Marín, Dalia; Nelius, Thomas, Filleur, Stephanie**

Prostate cancer is the second leading cause of cancer related death in men in western countries. Our focus is on PEDF (Pigment Epithelium Derived Factor) anti-tumor role in prostate cancer. PEDF is a secreted glycoprotein, which promotes neuronal survival and differentiation, and blocks angiogenesis. Moreover, CD47 is an integrin-associated protein that has been shown to play a role in several cellular processes such as apoptosis, proliferation, adhesion, migration and phagocytosis. Our research hypothesis is that PEDF down-regulates CD47 expression in prostate cancer cells allowing for the phagocytosis of tumor cells by macrophages. The CD47 down regulation was measured through RT-qPCR using several prostate cancer established cell lines - CL1E10, CL1PEDF. The experiment was performed four times to measure the accuracy. Our results showed that CD47 expression level was down-regulated in response to PEDF expression compared to control. As a next step, CD47 down regulation will be corroborated by FLOW cytometry, western blotting, and confocal imaging to validate our hypothesis. This project could lead to better understanding of the role of PEDF in the tumor microenvironment and may result in the identification of new therapeutic target for prostate cancer.
70. DEVELOPMENT OF A CRYOPRESERVATION TECHNIQUE FOR SPERMATOZOA OF NON-TRADITIONAL SPECIES

**Presenter(s):** Mujahid, Momina  
**Authors:** Mujahid, Momina; Prien, Samuel; Penrose, Lindsay

Cryopreservation (cell freezing) has become a routine practice for the storage of reproductive tissues in a number of species. However, the technique had proven less successful for more exotic species. As semen is very sensitive to fluctuations in temperature and can be killed with the exposure to excess heat or cold or a sudden change in temperature, the main objective of this research study was to design a device using simple materials which can be used on the field to store semen at a steady temperature drop for a specific species of lizard. The device’s current design is being modified to fit the requirements for the freezing curves of the mentioned species. The few semi-successful freezing attempts in this species have suggested its freezing curves will vary dramatically from those produced by our current unit. Furthermore, the device is portable and does not require any electricity or solar power to work.

71. COST-EFFECTIVE STRATEGY FOR LARGE SCALE PREPARATION OF SR-B1 ANTIBODY

**Presenter(s):** Noorani, Sahil  
**Authors:** Noorani, Sahil; Panchoo, Marlyn; Sabnis, Nirupama, Lacko, Andras

Current cancer chemotherapy obstacles include toxic side effects, limited accessibility of the drugs to tumor tissue, and multi-drug resistance. A unique drug delivery system has been developed utilizing reconstituted HDL (rHDL) nanoparticles to transport anti-cancer agents selectively to tumor cells via the scavenger receptor class B, type 1 (SR-B1). The purpose of this study was to develop a cost-effective alternative process for large scale production of the SR-B1 antibody compared to purchasing from a commercial supplier at a price of ~$400/100ul. This process is required to monitor the SR-B1 expression of cancer cells and tumors for developing personalized therapy regimens. We hypothesize that the purified antibody will function just as well as the commercially available SR-B1 antibody. Crude blood anti-serum from rabbits sensitized with SR-B1 antigen was applied to a Protein A agarose packed column, washed with PBS, and then eluted with citrate buffer. The collected samples were tested to determine protein concentrations and high protein fractions were pooled separately and dialyzed overnight. Each fraction was then tested using the known SR-B1 expressing cell extracts via Western blot analysis. The fraction containing the purified antibody was run against the commercial and crude antibodies using Western blots, which were then compared. As evidenced by the Western blots, the column purified fraction was able to detect the SR-B1 antigen even at a higher dilution than both the crude and commercial antibodies. The purified SR-B1 antibody is comparable in performance and about 264 fold more cost-effective to prepare than purchasing the commercial antibody.

72. UNDERSTANDING SPECIES LIMITS OF PEROMYSCUS MEXICANUS GROUP USING A GENETIC APPROACH

**Presenter(s):** Nunez-Tabares, Maria  
**Authors:** Nunez-Tabares, Maria; Ordonez-Garza, Nicte; Rowden, Gage, Bradley, Robert

The genus Peromyscus, deer mice is one of the most widely distributed mammalian taxa in North America. Due to their broad distribution this genus consists of more than 70 species. Currently Peromyscus is divided into 13 species groups. Peromyscus nudipes is one of the species in the P. mexicanus species group, and it is distributed from Nicaragua to Panama. P. nudipes systematic relationships to the other P. mexicanus species has not been well studied. For this study, 65 Cytochrome-b (cytb) sequences were examined, 28 samples were obtained from GenBank and the other 37 from the Museum of Texas Tech University. Mitochondrial DNA was extracted with standard DNA methods. Standard Polymerase Chain Reaction (PCR) procedures were followed using primers LH14115 and H15288 for amplification. The laboratory work included PCR cleaning,
and cycle sequencing using the same primers. Cycle sequencing reactions were purified and products were sequenced with an automated sequencer. Resulting sequences were aligned and proofed using sequencer 4,10.1 (Gene Codes Corp). A phylogenetic tree was generated using Maximum Likelihood and Bayesian methods, and genetic distances among samples to assess levels of genetic divergence of the species in the P. mexicanus group were calculated with the Kimura 2-parameter model of evolution.

73. MATHEMATICAL MODEL FOR TIME TO NEURONAL APOPTOSIS DUE TO ACCRUAL OF DNA DSBS

**Presenter(s):** Offer, Annabel

**Authors:** Offer, Annabel; Mohanakumar, Chindu; Rodriguez, Jennifer

We propose a mechanism to explain neuronal aging by tracking the number of non-transient DNA double-strand breaks (DSBs) and repairs over time that may lead to apoptosis. Neuronal apoptosis depends on the amount of space between DSBs as well as time. We derive three models to track the effect of neurodegeneration: a system of autonomous Ordinary Differential Equations (ODEs), a probability model to track the spatial requirement, and a stochastic model that incorporates both the ODE temporal dynamics and a spatial probability model. Using these models, we estimate a distribution for the lifespan of a neuron and explore the effect of parameters on time to death. We identify three possible causes of premature neuronal apoptosis: problems with coding critical repair proteins, issues with the neuron detecting DSBs, and issues with the neuron responding to DSBs.

74. ANTIMICROBIAL RESISTANCE OF SALMONELLA ENTERICA ISOLATES RECOVERED BEEF CATTLE FROM MÉXICO.

**Presenter(s):** Orellana, Diana Fabiola

**Authors:** Orellana, Diana; Ramirez, Alejandra; Maradiaga, Martha, Brashears, Mindy

Salmonella enterica is a leading cause of foodborne salmonellosis in the United States. The number of antibiotic resistant strains identified in humans is steadily increasing. Prevalence of antimicrobial drug resistant variants has been observed and identified in a number of illnesses worldwide. Fatality rates are higher for patients with infections caused by drug-resistant strains and they require hospitalization for longer periods. Salmonella isolates were previously collected from three Mexican abattoirs and two wet markets in Merida, Veracruz and Cancun. Salmonella isolates were grown on sheep blood agar and incubated at 35 °C for 18-24h before antimicrobial susceptibility testing using the SensititreTM automated antimicrobial susceptibility system. The minimum inhibitory concentrations (MICs) of 15 antimicrobials tested were be interpreted using the National Committee for Clinical Laboratory Standards for microdilution broth methods, and the National Antimicrobial Resistance Monitoring System (NARMS) breakpoints. From the total of samples that have been analyzed to date (n=20), 90% presented resistances to at least one antimicrobial. Additionally, isolates exhibited 8 different resistance phenotypes, in which predominated resistance to tetracycline (75%), resistance to streptomycin (55%) and resistance to chloramphenicol (50%) was observed. Furthermore, 50% of the isolates presented multidrug-resistant phenotypes. The most common were: penicillin, chloramphenicol, aminoglycosides, tetracycline, sulfides (15%), chloramphenicol, aminoglycosides, tetracycline (15%) and B-lactam, chloramphenicol, aminoglycosides, tetracycline, and sulfides (15%). 96 of additional isolates will be evaluated. Understanding the susceptibility or resistance of the isolates to different concentrations of antibiotics allows us to identify problematic sources and can potentially implement controls in the future.
75. PREVALENCE OF ANTIBIOTIC RESISTANT AND SUSCEPTIBLE CAMPYLOBACTER IN RETAIL GROUND BEEF

**Presenter(s): Ortega, Paden**

**Authors:** Ortega, Paden; Loneragen, Guy; Ortega, Katelyn; Brahsears, Mindy; Vipham, Jessie

This study was conducted to determine if Campylobacter isolates collected in the spring of 2013 from retail ground beef are resistant, intermediate or susceptible to antibiotics using the National Antimicrobial Resistance Monitoring System sensitiitre methods. This experiment was also performed to identify the recovery of Campylobacter isolates collected a year ago. The FDA estimates that approximately 2.4 million cases of Campylobacteriosis occur annually (Food and Dry Administration, 2013). The mentioned statistic is an underestimate because not everyone goes to the doctor when they are sick. I hypothesized that the Campylobacter isolated from ground beef samples collected a year ago would vary in antibiotic resistance and susceptibility to different antibiotics. To conduct this study, 200 ground beef samples were collected from seven grocery stores across the city of Lubbock in the spring of 2013. Initial Campylobacter testing was conducted on the ground beef samples. Prevalence was determined based on the BAX PCR detection system, agglutination confirmation, and conventional biological growth on highly selective and differential media. The study conducted a year ago identified an overall prevalence of 28%. After Campylobacter growth was determined and confirmed, 175 isolates were collected and frozen for future research. Frozen isolates were streak plated onto blood agar medium, incubated for 48-60 hours under microaerophilic conditions, and subjected to NARMS sesititre testing. 88 isolates were recovered successfully and subjected to varying concentrations of different antibiotics. In conclusion, my hypothesis was correct in that the antibiotic resistance and susceptibility varied between isolates and drug.

76. THE EXPLOITATION OF ALTERNATIVE AROMATASE PROMOTERS BY ER+ BREAST CANCER

**Presenter(s): Pace, Annelise**

**Authors:** Pace, Annelise

The growth and proliferation of estrogen receptor alpha positive (ER+) breast cancer tumors in post-menopausal women is driven by increased intratumoral levels of estrogen. Previous research has shown that the enzyme aromatase, which converts androgens to estrogens, is abnormally expressed in ER+ breast tumors. The objective of this research is to understand how aromatase becomes significantly upregulated in these tumor cells. The expression of the aromatase gene, CYP19A1, is tissue-specific and seems to be controlled primarily at the transcriptional level. Different tissues transcribe CYP19A1 via a unique promoter region, or 5’ Untranslated Region (5’ UTR), that is then spliced together with the coding exon of the gene so that all transcripts, regardless of their 5’ UTR, make the same protein, aromatase. Breast tumor cells exploit multiple promoter regions as one way to increase the expression of CYP19A1, leading to an increased production of estrogen. This project uses reverse transcription-polymerase chain reaction (RT-PCR) to detect which tissue-specific transcripts are present in three different breast cancer cell lines, MCF7, MDA-MB-231, and JEG-3. An aromatase gene specific primer (GSP) is used during cDNA synthesis to optimize the results. From there, quantitative real-time PCR is utilized to determine the percentage of total aromatase levels that active promoters contribute. Intriguingly, the results show that each cell line, derived from different parts of the breast tumor, is unique in its use of the various promoter regions, suggesting that future breast cancer treatments could be targeted to the specific type of cells affected.

77. SYNTHESES OF BSIMUTH-BASED PHOTOCATALYSTS VIA SOL-GEL CHEMISTRY

**Presenter(s): Pacheco, Belinda**

**Authors:** Pacheco, Belinda; Ramirez, Donald

Bismuth-based photocatalysts are seen as attractive materials in energy conversion and organic pollutant remediation due to their efficient, visible light-driven photocatalytic behavior. Herein, bismuth-based photocatalysts have been synthesized via a novel one-pot procedure which utilizes
epoxide initiated, sol-gel techniques. By modifying the synthetic parameters, an assortment of bismuth-based compounds were developed and subsequently characterized using XRD. Investigation of particle morphology and surface area were performed using SEM and BET, respectively, while the photocatalytic activity of each compound was evaluated using rhodamine B as the organic target model. The bismuth-based materials synthesized exhibit complete dye degradation under visible-light irradiation. After extensive characterization the findings suggest that material composition modulates photocatalytic behavior which can be controlled by changes in synthetic scheme. These highly active light-driven photocatalysts demonstrate the importance of developing new synthetic protocols to modulate nanomaterial development, imparting improved bulk-scale behavior that can ultimately be utilized to develop next-generation devices.

78. VITAMIN D INCREASES CHOLESTEROL EFFLUX AND APOPTOSIS IN BREAST CANCER

**Presenter(s):** Ponce, Christopher

**Authors:** Ponce, Christopher; Tabassum Munir, Maliha; MD Khurshidul, Zahid, Tarafdar, Kaiser; Rahman, Shaikh

Breast cancer is the second most-common cancer related death in the USA. Cancer cells undergo metabolic changes during progression. Several studies have revealed cholesterol as an important regulator of breast cancer development though the molecular mechanisms remain unknown. Vitamin D is not only an essential component for bone and calcium metabolism but plays critical role to improve insulin resistance, inflammation and in the prevention of foam cell formation in macrophages. In addition, studies have shown lower levels of serum vitamin D in breast cancer patients. However, whether vitamin D regulates cancer cell proliferation by regulating cholesterol metabolism is not clear. We hypothesize that vitamin D prevents cancer cell proliferation by regulating cholesterol homeostasis and increasing apoptosis. MCF7 (estrogen receptor (ER) positive) cells were grown in DMEM high glucose medium and treated with (1uM and 2 uM) and without (control) vitamin D (calcitriol) for 24 hours. Cells were harvested and lysed with lysis buffer and nuclear and cytosolic fractions were prepared. Vitamin D treatment significantly increased the expression of ATP-binding cassette transporter A1 (ABCA1, a protein involved in cholesterol efflux) and 5' AMP-activated protein kinase (AMPK, a regulator of energy metabolism and inhibits inflammation) activity as evaluated by identifying the expression of phosphorylated AMPK (P-AMPK) and cleaved caspase 3 (which is involved in apoptosis) proteins. Interestingly, Vitamin D treatment also decreased cancer cell viability and induced epigenetic changes. Altogether, the results indicate that Vitamin D might be a promising therapeutic option to prevent cancer cell progression.

79. HONDURAN FED CATTLE DIETS AND THEIR RESULTING EFFECT ON LIVE WEIGHT AND RIBEYE AREA

**Presenter(s):** Poou, Axel

**Authors:** Poou, Axel; Carmichael, Remy; Garmyn, Andrea, Brashears, Mindy; Miller, Mark

The majority of cattle diets in Honduras involve grass feeding, which routinely results in a low dressing percentage and live animal growth. The objective of this study was to explore three alternative diets for increased growth in beef cattle production. We will also establish how these diets affect live weight at harvest and the relationship to carcass ribeye area. The four dietary treatments used were sugar cane, palm kernel meal, a native feed mix, and a grazing treatment with mineral supplementation as a control. Carcass harvest, quality, and fabrication data (n = 125) were collected throughout the year in 2015 at Del Corral facilities in Siguatepeque, Honduras, CA. Our results showed that diet contributed to live weight (P less than 0.05), and the heaviest live weights resulted from the palm kernel meal treatment. Additionally, the grazing treatment and the native premix resulted in lighter live weights than any other treatment, with no difference between the two (P greater than 0.05). Ribeye area was similar (P greater than 0.05) between the four diets. This lack of significance can most likely be attributed other factors not quantified within this study, including age, days on feed, breed type and environmental stress. Furthermore, there was no correlation between
live weight and ribeye area on this group of cattle. From these results, we can conclude that diet affects live weight but does not affect ribeye area, and that live weight was not related to ribeye area.

80. INFLUENCE OF PH ON YEAST CELL SIZE AND AGING: IT’S PRETTY BASIC

Presenter(s): Rajan, Arsheen
Authors: Rajan, Arsheen; Smith, Jessica; Hua, Hui, Schneider, Brandt

Aging is a complex process. The purpose of our research is to investigate the intricate pathways involved in aging and proliferation in a simple model organism, with the goal of increasing lifespan. Yeast serve as ideal model organisms to study aging; many pathways have been conserved from yeast to humans. Moreover, Sir2, a quintessential longevity gene, was first discovered in yeast. Sir2, a histone deacetylase, regulates aging in a wide range of model organisms. For example, increased Sir2 expression increases lifespan and vice versa. However, the molecular mechanisms whereby Sir2 modulates aging are not well understood. Results from our lab demonstrate that longevity correlates closely with cell size. Small cells are long-lived and large cells are short-lived. Increased Sir2 activity decreases cell size. Research has shown that nicotinic acid stimulates Sir2 activity, reduces cell size, and acidifies yeast media. I hypothesize that decreasing the pH of yeast media ALONE reduces cell size. To test this, cells were grown in media with varying pH, and cell size and number were monitored. Observations have revealed that cells grown at lower pH are significantly smaller than those grown in alkaline conditions. In addition, the ability of nicotinic acid to reduce cell size is partially dependent upon its ability to acidify the medium. My results suggest external pH may also modulate cellular lifespan. Cancer progression has been linked to acidic tumor microenvironments. Understanding the role of pH in cell proliferation could be crucial in control and treatment.

81. MYCN AND MYC EXPRESSION PROFILE IN ETOPOSIDE SENSITIVE AND RESISTANT NEUROBLASTOMA CELL LINES

Presenter(s): Rodriguez, Brian
Authors: Rodriguez, Brian; Blaydes, Rachel; Davidson, Heather, Song, Michael; Reynolds, Patrick

Introduction: Neuroblastoma is a malignancy that occurs in the sympathetic nervous system, most frequently in the adrenal gland. It is the most common extracranial solid tumor in childhood and infancy. The MYC family of proto-oncogenes includes MYC (c-MYC) and MYCN and their altered regulation has been linked to poor outcomes in cancer and neuroblastoma, respectively. The purpose of this study was to examine the MYCN and MYC expression in a panel of 10 neuroblastoma cell lines (CLs) that are either sensitive or resistant to etoposide, a chemotherapeutic agent commonly utilized in the treatment of high risk neuroblastoma patients. Methods: The 10 continuous NB CLs (5 etoposide sensitive & 5 resistant) were identity confirmed via short tandem repeat (STR) profiling and verified to be free of EBV and mycoplasma. The cytotoxicity response profile of the CLs was obtained via the DIMSCAN cytotoxicity assay. The mRNA expression levels of MYC and MYCN were measured via RT-qPCR. Results: The sensitive and resistant groups both included cell lines derived from pre-treatment (DX) and progressive disease (PD) patients and included both MYCN gene copy number amplified and non-amplified CLs. The MYCN non-amplified models demonstrated the lowest levels of MYCN expression. Both groups included CLs with low and multi-log higher levels of MYCN and MYC expression. The MYCN and MYC expression levels demonstrated inverse correlation. Conclusion: In the cell lines examined, the MYCN or MYC expression levels did not correlate with the sensitivity to etoposide.
82. FUNCTIONAL AMYLOIDS: A LINK BETWEEN YEAST MATING AND MAMMALIAN FERTILIZATION

**Presenter(s):** Rowden, Gage

**Authors:** Rowden, Gage; Muthusubramanian, Archana; Cornwall, Gail

Amyloids are self-aggregating proteins which form cross-beta sheet fibrils. They are typically thought of as pathogenic structures such as the A-beta aggregates and neurofibrillary tangles in Alzheimer’s disease. However, amyloid can also carry out normal biological roles in the absence of pathology. In a previous study we found that functional amyloids were present in the normal mouse sperm acrosomal matrix, and the zona pellucida (ZP) surrounding the mouse oocyte, suggesting amyloids may play a role in sperm-egg recognition. A sequence analysis of the mouse ZP3 protein using AmylPred 2, which predicts amyloidogenic sites, revealed an important hydrophobic region that is conserved in mollusk, fish, frog, quail, and human ZP3 proteins and is also present in the alpha-agglutinin/Sag1p protein in Saccharomyces cerevisiae, a protein known to be involved in sexual recognition between the Mat-A and Mat-alpha mating types. This suggests yeast sexual mating, as in mammalian fertilization, may be mediated through an amyloid-amyloid interaction. Discovering a similar mechanism for sexual recognition between complex multicellular animals and single-celled eukaryotes would illustrate remarkable conservation through hundreds of millions of years of evolution. Using Congo Red (CR) and Thioflavin-S (Th-S) and the confirmation dependent antibodies, OC and A11, to selectively bind to cross-beta sheets, we observed a concentration of amyloid at the shmoos (mating-specific cell wall extensions) in both mating types. The presence of a signal in these extensions would imply amyloid is involved in yeast sexual reproduction; however, further research is required to establish the interaction of amyloids during the formation of the mating bridge.

83. INVESTIGATING THE RELATIONSHIP BETWEEN ENVIRONMENTAL ENRICHMENT AND THE RESPONSE TO STRESS IN PIGS.

**Presenter(s):** Rubenthaler, RaeAnn

**Authors:** Backus, Brittany; Rubenthaler, RaeAnn

Environmental enrichment (EE) is the use of physical or social aspects to improve the quality of life of caged animals. There is a direct influence on the physical and psychological development of an animal with the environment in which it was reared. EE has shown to reduce anxious and agonistic behaviors, and is protective from stressors; improving the overall wellbeing of animals. The objective of this study was to determine if pigs reared in environmentally enriched pens were better adapted to change and less fearful of novelty than pigs reared in standard, control pens. To test this, 28 d old pigs were housed for a minimum of two weeks in enriched (E; n = 32) or control (C; n = 32) pens. We then randomly tested all pigs in two anxiety behavioral tests. Pigs were placed in a novel arena for a 5 min familiarization period, then either a novel object (the open field [OF] test) or an unfamiliar human (the human interaction test [HIT]) was introduced for a 5 min interaction period. Anxiety-like behaviors; vocalizations, activity and freezes, were determined for each period of each test. The latency to interact, number and duration of interactions with the novel object or human were also determined. We hypothesize that EE will create a positive affective state, enabling E pigs to adapt to and cope with the stress of a novel environment. E pigs will display fewer anxiety-like behaviors and interact with the novel object or human in the OF test and HIT, respectively, quicker than C pigs.

84. THE UTILIZATION OF BACTERIOPHAGE THERAPY TO TREAT METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA)

**Presenter(s):** Schwettmann, Blake

**Authors:** Schwettmann, Blake; Ramasubramanian, Bhagavathi; Fralick, Joe

Methicillin-resistant Staphylococcus aureus (MRSA) is one of many bacteria that have evolved resistance to commonly prescribed antibiotics. This has been a challenge not only in treating infected wounds of a healthy patients, but also in dealing with infected wounds on diabetic ulcers, where biofilms form and treatment often proves futile. Phage therapy is seen as a potential solution to this
problem, as there is no correlation between antibiotic sensitivity and phage sensitivity (i.e. antibiotic resistant bacteria are sensitive to phage) many bacteria are more sensitive to attack by these bacteriophages. Our approach in this study is to use multiple phages (phage cocktail) to treat MRSA infections employing a mouse wound model. In order to decide the best phage to use in this cocktail we have begun characterizing the individual phage of our MRSA phage collection. Our initial experiments have been to characterize and quantify how the different bacteriophages of our phage collection infect and grow on MRSA cultures. One-step growth curves and standard bacterial plate counts of the different members of our phage collection, are being employed to test the effects of calcium and serum on the efficiency of the different phage to target MRSA cells. Hopefully, the data gathered from these experiments can help determine a course of action in the treatment of the in vivo animal wound model.

85. USE OF GALLERIA MELLONELLA AS A MODEL ORGANISM TO STUDY WOUND INFECTIONS

**Presenter(s): Scott, Helen**

**Authors:** Scott, Helen; Gabrilska, Rebecca; Rumbaugh, Kendra

The impact of wound infections on healthcare is enormous. Infections of the dermis, including burns, surgical-site infections and diabetic foot ulcers affect a large population and cost over $18 billion in direct medical costs in the U.S. annually. The microbial populations of these infections are typically polymicrobial and often resistant to antibiotics. Polymicrobial communities often display synergistic interactions that can enhance virulence, persistence and/or antimicrobial tolerance. One major focus of our research is to understand the influence that polymicrobial interactions have on wound infections, especially those caused by the ESKAPE pathogens (Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacter species), a group of bacterial species that are often responsible for nosocomial and wound infections, and are resistant to antibiotics. One strategy we use to study the polymicrobial interactions is to measure the impact of co-infection versus monoinfection on virulence in mouse wound infection models. However, these experiments can require many animals. The invertebrate, Galleria mellonella (Greater Wax Moth) has been proven to be a representative model for Pseudomonas aeruginosa wound infections in mouse models. For this study, we hypothesized that G. mellonella larvae can be effectively used as a surrogate model to study polymicrobial interactions in wounds. To test this hypothesis, G. mellonella were infected with ESKAPE pathogens then measured for mortality and bacterial growth to evaluate virulence and polymicrobial synergy. These data suggest that the underlying mechanisms of infection are similar in mice and wax moth larvae, making them a suitable model to study wound infections.

86. SEX RATIOS AND SEXUAL DIMORPHISM IN THE DIOECIOUS TREE POPULUS BALSAMIFERA L. (BALSAM POPLAR)

**Presenter(s): Scott, Helen**

**Authors:** Scott, Helen; Hale, Haley; Olson, Matt

Sexual dimorphism in plants may arise because of differential investment in reproduction between males and females, and biased sex ratios from 1:1 may arise if different sexes have different environmental requirements. We tested for variation in sex ratio and sexual dimorphism in growth and timing of dormancy among 33 populations of the dioecious boreal forest tree Populus balsamifera L. (balsam poplar) collected from throughout Canada and Alaska and growing in a common garden in Fairbanks, Alaska. The common garden was planted in 2009 from rooted cuttings from 478 different trees, approximately 15 from each of the 33 populations. Timing of dormancy (spring bud flush, fall bud set, and leaf senescence) was monitored in 2010 and 2011, and height has been measured each year from 2010-2015. We used a PCR-RFLP to identify gender-associated alleles at the sex determination locus on chromosome XIX of these individuals. Sex ratios within populations varied from 26.7% male to 75.0% male. We will test the hypotheses that sex ratio varies more than is expected by chance among these populations and that the two genders differ significantly in their
timing of dormancy and height growth, after adjusting for population origin. Our results will be interpreted in relation to sexual selection theory and whether physiological differences between the genders could have an effect on the species’ ability to migrate north in response to global climate change.

87. THE EVOLUTIONARY ECOLOGY OF THE MOLECULAR ADAPTATION TO UNDERGROUND LIVING IN HIGH ELEVATION FOSSORIAL RODENTS (RODENTIA: CTENOMYIDAE)

**Presenter(s): Sherali, Susan**

**Authors: Salazar-Bravo, Jorge; Sherali, Susan**

In lineages invading new ecological zones, intensified natural selection should occur for morphological and molecular adaptations. The ecological transition from surface to subterranean lifestyle in rodents of the genus Ctenomys (South American tucos) is a dramatic example. In less than 1.8 million years the genus evolved from surface dwelling to strict fossorial; this diverse genus (65 species at last count) is known to occur in elevations from sea level to over 13,000 feet. One of the biggest challenges of living exclusively in an underground environment is acute tissue hypoxia during daily activities, especially if these activities are conducted at very high elevations. In order for these rodents to be able to function at high elevations, molecular adaptations must have occurred. Among these, changes in molecules that transport oxygen and that ultimately support large periods of acute tissue hypoxia probably were very important. Myoglobin (Mb) contributes to intracellular oxygen storage and transcellular diffusion of oxygen in muscle, and plays an important role in supplying oxygen in hypoxic conditions. The objective of this research was to identify, (1) the evolutionary pattern of the Mb gene in Ctenomys and (2) to detect if there is positive selection at amino acid level of this protein. In this contribution, we present a progress in our studies to understand the evolution of the myoglobin protein in the fossorial rodents.

88. INVESTIGATING HISTONE MODIFYING PROTEINS IN FIN REGENERATION AND CRANIOFACIAL DEVELOPMENT

**Presenter(s): Solis-Wheeler, Mychael**

**Authors: Solis-Wheeler, Mychael; Yette, Gabriel; Stewart, Scott, Stankunas, Kryn; ,**

Zebrafish possess the remarkable capability to fully regenerate damaged appendages and organs. During epimorphic regeneration, differentiated cells at the injury site revert to a progenitor state by repressing mature cell genes and reactivating genes that previously functioned during embryonic development. These progenitor cells proliferate and then re-differentiate to restore the damaged or lost tissue. How cells produce large-scale gene expression changes in response to regenerative cues is poorly understood. Epigenetic reprogramming through the dynamic control of histone modifications plays a major role in regulating gene expression. We found that several histone modifying proteins are up-regulated in regenerating fin tissue. Using CRISPR/Cas-9, a precise genome-editing tool, we generated null alleles of one histone modifier. We found that homozygous mutant zebrafish had pleiotropic developmental defects and did not survive past larval stages. Although we were unable to use these alleles to investigate adult fin regeneration, we used them to determine that the histone modifier controls craniofacial bone growth and morphogenesis. A small molecule inhibitor approach suggested the histone modifier has an analogous role during adult bone regeneration. We propose that the histone modifier maintains a pool of bone progenitors during both development and regeneration by repressing premature activation of differentiation pathways. A mechanistic understanding of this histone modifier’s roles during zebrafish development and regeneration will provide insights into how to manipulate epigenetic systems to augment innate human regenerative responses.
89. MECHANISMS OF PASSIVE INWARD TRANSPORT IN HYPERALDOSTERONISM MUTANTS AND NORMAL NA/K PUMPS

**Presenter(s):** Spontarelli, Kerri

**Authors:** Spontarelli, Kerri; Meyer, Dylan J.; Allen, Morgan, Olivera, J. Fernando; Artigas, Pablo

Cell Physiology & Molecular Biophysics, Center for Membrane Protein Research, Texas Tech University Health Sciences Center, Lubbock, TX. Under physiological conditions wild type (WT) Na/K pumps (NKAs) catalyze the uphill extrusion of three sodium from the cell in exchange for 2 potassium, at the cost of one ATP molecule. Hyperaldosteronism (HA)-inducing mutations of the NKAs in adrenal gland adenomas induce a passive influx of sodium through the mutant NKAs. Under non-physiological conditions, without external sodium or potassium, WT NKAs passively import protons. We used two-electrode voltage clamp electrophysiology of oocytes expressing WT or HA-mutant NKAs to address whether similar mechanisms and pathways are involved in ion flow through mutated and wild type pumps. One of the 3 ion-binding sites, site-III, only interacts with sodium, while sites-I and -II can bind either sodium or potassium. Proton flow in WT MKAs occurs through a mechanism where protons traverse site III. To test the contribution of sites I and II to proton flow we simultaneously introduced 3 mutations (E327D, N776T, E779D) to disrupt ion binding there by increasing the size of the ion-binding cavity. Resembling the HA mutations, the triple mutant presented a large current inflow with external solutions containing sodium. The single-mutant E327D in transmembrane segment (TM) 4 behaved like E327D/N77T/E779D. It has been proposed that the ions imported in two HA mutations, L97R (in TM1) and V325G (in TM4), travers a distinct pathway than the protons in WT NKAs. To test this proposal, we concomitantly introduced the site-III mutation D926N (known to abolish proton permeation in WT pumps) with L97R, V325G, or E327D. Large current inflow was observed in both L97R/D926N and V325G/D926N, but not in E327D/D926N. This suggests that the pathways for passive ion flow differ in HA mutants, WT or E327D mutant pumps.

90. EXPRESSION OF COMPLEMENT RECEPTOR 1 (CD35) ON EARLY THYMIC EMIGRANTS

**Presenter(s):** Stanopiewicz, Jenna

**Authors:** Stanopiewicz, Jenna

The complement system is an important element in host defense against bacterial and viral infections, and is an important regulator of T cell immunity. We have previously shown that a small percentage (6 to 12%) of peripheral blood CD4+ helper T cells express Complement Receptor 1 (CD35), suggesting one of two possibilities. Either CD35 is an inducible receptor that is homeostatically regulated or CD35 marks a separate thymic derived lineage of T-cell. The thymus is a small organ that provides an environment conducive to the development of different types of T cells, each with its own unique function and phenotype. In the periphery, fully developed T cells that have not encountered a foreign microorganism are known as naïve T cells, which fall into two phenotypically distinct categories, early (CCR7+ CD45RA+ CD45RO- CD31+) and late (CCR7+ CD45RA+ CD45RO-CD31-) thymic emigrants. In addition to the loss of CD31 late thymic emigrants can acquire and differentially express additional receptors. If our hypothesis is correct that T cells expressing CD35 are a unique developmental lineage, CD35 should be found on some early thymic emigrants. We tested this possibility by purifying and separating naïve CD4+ T cells from the effector/memory T cell population and analyzed early (CD31+) and late (CD31-) thymic emigrants for the expression of CD35. Consistent with our hypothesis, we found a small population of early thymic emigrants that express CD35. We are in the process of isolating this subpopulation of naïve CD31+ CD35+ T cells for functional analysis.
91. IMPACTS OF WILDFIRE ON VALLES CALDERA NATIONAL PRESERVE ANT COMMUNITIES

Presenter(s): Tatum, Zachary
Authors: Tatum, Zachary; Gracia-Hernandez, Maria Del Mar; Knudsen, Jonathan, Parmenter, Bob; Verble-Pearson, Robin

Wildfires are known to have an effect on animal community structure, abundance, and diversity. The goal of this project is to survey the effect of wildfires on ant communities at Valles Caldera National Preserve. The researchers are sorting and identifying ants collected via pitfall traps from sites at the Valles Caldera National Preserve that were impacted by the 2011 Las Conchas Wildfire. The researchers anticipate that ant species richness, abundance, and species composition will differ between burned and unburned sites. The researchers predict that samples taken in burned areas will have fewer ants, fewer species, and different species than those collected at unburned sites.

92. COMPARING THE DIFFERENCE IN EATING QUALITY FROM HOT-BONED AND CONVENTIONALLY CHILLED BOVINE MUSCLES

Presenter(s): Toro, Mateo
Authors: Toro, Mateo; Crownover, Roy; Garmyn, Andrea, Miller, Markus

Beef carcasses are usually chilled for 24 hours after slaughter to maintain meat quality. The use of chilling rooms is an expensive energy process in a slaughterhouse. The objective of this research was to evaluate meat quality from hot-boned muscles when compared to chilled muscles. For this study, 32 steers were humanely slaughtered at an average age of 30 months. Carcasses were cut in half and each side was randomly assigned as hot or cold carcass treatment. Cold carcass muscle treatments were chilled prior to boning for 24 h. Hot carcass muscle treatments were boned within 2 h. after slaughter. Muscles collected included Longissimus thoracis, Semimembranous, Gluteus medius, Longissimus lumbarum and Psoas major for both treatments. Muscles were sliced, and aged for 7, 21 or 35 d. and frozen. Warner-Bratzler shear force, proximate, sarcomere length and sensory analysis were conducted for hot and cold carcass muscle treatments. Consumers (n = 1200) evaluated tenderness, juiciness, and flavor. Lack of palatability differences between hot-boned and chilled beef muscles can reduce processors energy costs by removing certain muscles before chilling processes.

93. NEXT-SCIENCE: A NOVEL AGENT THAT PREVENTS DUAL BIOFILM DEVELOPMENT BY STAPHYLOCOCCUS AUREUS AND PSEUDomonAS AERUGINOSA IN THE IN VITRO LUBBOCK CHRONIC WOUND MODEL.

Presenter(s): Tsen, Adam
Authors: Hamood, Abdul; Mudaliar, Nithya; Ramon, Mikal, Myntti, Matthew; Tsen, Adam

Chronic wounds such as pressure ulcers, venous leg ulcers, and diabetic foot ulcers represent a serious problem and require costly treatment. Chronic wounds are colonized with wound pathogens including Staphylococcus aureus and Pseudomonas aeruginosa. Over time, the infections become polymicrobial, consisting of numerous species. Within the wound, the bacteria form protective structures termed biofilms. Therefore, it is essential to investigate alternative antimicrobial agents. We previously showed that Next Science (NS) is a novel antimicrobial agent that inhibits the development of single biofilms by different wound pathogens. We hypothesize that NS is effective in preventing wound pathogens dual biofilms. Using the previously described Lubbock chronic wound pathogenic biofilm (LCWPB) model, we assessed the efficacy of NS in preventing the development of S. aureus and P. aeruginosa dual biofilm. The LCWPB formation media include; Bolton broth with 50% plasma and 5% freeze-thaw lacked horse red blood cells (RBC). Coagulase produced by S. aureus converts the fibrinogen within the biofilm medium to fibrin producing a matrix of interconnected fibrose material that closely resembles debrided tissues from infected wounds. S. aureus and P. aeruginosa formed a dual biofilm within the matrix. In the presence of NS, S. aureus failed to form the Matrix and no microorganisms were recovered. The addition of NS to either a single
S. aureus or a S. aureus/P. aeruginosa dual biofilm eliminated the biofilm and dissolved the matrix. These results suggest that NS is effective agent to treat S. aureus and P. aeruginosa infected wounds.

94. RELATIONSHIP AMONG FKBP5 GENOTYPE, SERUM CORTISOL, AND COGNITIVE FUNCTION IN AGING HUMANS: A PROJECT FRONTIER STUDY

Presenter(s): Tucker, Cody
Authors: Tucker, Cody; Harris, Breanna

An individual reacts physically to stressful events, and during the reaction the body releases cortisol which can be used as a quantifiable way to measure the stress of that individual. Genotype is also able to affect cortisol levels through a gene called FKBP5, which has been reported to increase the amount of cortisol produced after stress if a specific single nucleotide polymorphism (SNP) is present (rs1360780). Stress can also have a detrimental effect on cognitive function, which in turn may lead to dementias such as Alzheimer’s disease. We predict that there is a relation between cortisol, FKBP5, and cognitive function when observed over time. Samples used to test this hypothesis have been taken from Project FRONTIER, a data-set at TTUHSC containing medical information for individuals 40-90 years old. Participants come in every three years for sampling and cognitive testing. Cognitive ability has been independently quantified by Project FRONTIER using standardized cognitive examinations during each visit. Cortisol has been previously assayed and quantified from human serum samples from a baseline visit and the next three year follow-up using commercially available radioimmunoassays. DNA samples used for genotyping are currently being extracted from human whole blood samples and will be genotyped via q-PCR to determine the SNP. Previous results looking at cortisol and cognitive ability showed no significant correlation. However, we anticipate increased levels of cortisol at both time points for an individual possessing the indicated SNP, as well as decreased cognitive test scores when compared to the whole population.

95. SPECTRAL IMAGING OF PLASMA OPTICAL EMISSION VIA COMPRESSED SENSING

Presenter(s): Usala, John
Authors: Usala, John; Maag, Adrian; Gamez, Gerardo

Spectral imaging currently requires array detectors that are very expensive. Further, the acquired image files are typically subjected to compression to keep data manageable which is achieved without loss of critical information, showing the sparsity of the data. Imaging through compressed sensing, however, aims at performing compression during acquisition which results in a more efficient use of experimental resources, such as time and cost. In this study, a single pixel photon detector utilizing compressive sensing will be constructed and used to obtain optical emission spectral images from atmospheric pressure plasmas. The setup consists of a digital micro-mirror array and a monochromator which is an order of magnitude less expensive than traditional setups using CCD cameras. Spectral images of optical emissions from plasma species of interest (He, O, N) will be obtained. The spatial resolution will be characterized as a function of experimental and image processing parameters such as sensing matrix selection and recovery algorithm choice. Further, the spectral images will be compared to a more expensive push-broom hyperspectral imaging system featuring an ICCD camera.

96. MICROBIOLOGICAL AND GEOCHEMICAL EVALUATION OF DUST STORMS ON THE TEXAS HIGH PLAINS

Presenter(s): Valencia, Hector
Authors: Valencia, Hector; Moore-Kucera, Jennifer

In the Texas High Plains, dust storms are a common occurrence due to agriculture practices that leave soils with a high erodibility index compared to naturally vegetated systems. This loss of the top soil leads to the reduction in ecosystem services that microbial communities provide at the source, but also has large implications to affect down wind environments like urban areas and natural
ecosystems, in both positive and negative ways. What this observational study aims to do is get a fingerprint of the microbial community, as well as the elemental composition, that travels on dust particles and throughout the air. Samples are to be collected on dusty and windy days during the spring months when dust storms occur more regularly. Samples will be collected using a dust trap system developed by the United States Geological Survey. Dust traps will be allowed to sit out for up to two weeks at a time, depending on environmental conditions. Dust samples will then be subjected to a series of laboratory assays to evaluate viability of microbial organisms to be cultured, elemental composition, and, with sample size permitting, evaluate the enzymatic activity. This study will be used as a base to develop more in depth research projects that could be used to better evaluate the effects that dust storms play on both natural and urban environments. We hope to find differences in the dust storms across seasonal variability that could potentially be caused by both pre-planting and post harvesting activities used on agricultural lands.

97. TRANSPOSON ANALYSIS IN THE AARDVARK GENOME

**Presenter(s):** Wafa, Alicia  
**Authors:** Wafa, Alicia; Ray, David; Mangum, Sarah, Platt, Roy

Transposable elements (TEs) are DNA sequences with the ability to copy or move themselves within a genome and found in all eukaryotes that have been investigated. They can be useful tools in unearthing clues about the evolution of the genomes in which they reside. Occasionally, they may also play an active evolutionary role. Useful as they are, transposable elements are seldom thoroughly analyzed. This study will provide a detailed analysis of the transposable elements (TEs) of the aardvark genome. A full study of the transposable elements of the genome will include factors such as the relative content, TE identities, and the identification of novel TE families. Such data will be useful for researchers who are investigating the evolution of mammalian genomes.

98. REEVALUATING PHYLOGENETIC RELATIONSHIPS WITHIN THE PEROMYSCUS BOYLIII GROUP

**Presenter(s):** Wagley, Marisa Elise  
**Authors:** Wagley, Marisa Elise; Keith, Megan; Bradley, Robert

The genus Peromyscus has been the focus of many systematic studies because of the diversity that exists within this group of rodents. This genus can be divided into 13 species groups, the specific arrangements of each being a topic for evaluation. The Peromyscus boyliii group is of special interest because of the speciation that has occurred within this group. This is due to the diverse environmental and geographical isolation that has followed in the regions of Mexico in which these species occur. Previous studies have examined morphological, allozymic, mitochondrial and nuclear DNA sequences, and karyotypic data to try to resolve species level relationships within this group. Herein, we propose to utilize a combined dataset consisting of one mitochondrial (Cytb) and five nuclear genes (Adh1-I2, Fgb-I7, Dmp1, GHR, Rbp3) to attempt to resolve relationships within the boyliii species group. DNA sequences from these genes will be analyzed in a phylogenetic context (Bayesian and likelihood methods) in order to determine the evolutionary relationship of species within the boyliii group.

99. CANCER EARLY DETECTION: AN OVERVIEW OF DEVICES AND BIOMARKERS

**Presenter(s):** Walterscheid, Brooke  
**Authors:** Brooke, Walterscheid

As survival rates steadily decrease with the respective stage of cancer, it is crucial to identify cancer at its earliest stages when the chances of response to treatment are higher. In addition to catching the disease in early and generally treatable stages, early detection devices also allow for more time available for treatments. These tests are typically inexpensive and noninvasive. Recently, diagnostics have shifted to point-of-care devices, which allow for bedside, clinical testing using microRNA analysis, microfluidic technology, nanodevices, multimarker assays, and multiplexed panels. These
methods are designed to detect various types of cancer biomarkers with high sensitivity and specificity. However, these new diagnostic devices must be able to discriminate malignant tumors from benign neoplasias, inflammation, and other environmental factors. To improve upon present early detection devices, the current market must be overviewed to evaluate the strengths and weakness of each device, and how the future of early detection devices can aim to solve present challenges.

100. USING GENOMICS AND BIOINFORMATICS TO DETERMINE THE ORIGIN AND PHYLOGENETIC SIGNIFICANCE OF THE ZONADHESIN GENE IN RODENTIA

**Presenter(s):** Watson, Whitney

**Authors:** Roberts, Emma; Watson, Whitney; Hardy, Daniel, Bradley, Robert

Zonadhesin (ZAN) is a multi-domain protein that is utilized in the binding of the egg's zona pellucida layer (ZP) to the spermatozoa. It has been suggested that this process may function in a species-specific fashion and thereby regulate hybridization between closely related species. However, to date, ZAN’s role in species-specific interaction is poorly understood and viability of hybrid offspring between species is largely unknown. ZAN’s structural domains have been studied in several domesticated mammalian taxa, but unfortunately wild rodent systems have been under-utilized in reproductive isolation studies. Rodents are an ideal group of taxa for examining the reproductive role of ZAN, as rodents are r-selected and evolve rapidly compared to other mammalian orders. This thereby generates a system where the genome evolves at a quicker rate due to short gestation times and a rapid population turnover. Currently, we are comparing conserved and variable regions of ZAN in representative species from five suborders of Rodentia to examine differential variability in the gene and determine if regions of this gene are phylogenetically informative in this group of mammals. Protein-coding DNA of ZAN will be obtained from genetic databases for representatives from each suborder. Sequences from domains of interest will be aligned and scored for statistical accuracy using various software programs. Levels of sequence differentiation will be used to assess the rate of molecular evolution and possible codon and nucleotide biases in this gene among this taxonomic group. Further, research on ZAN enhances our understanding of the mammalian reproductive system.

101. THE ANSWER MY FRIENDS IS BLOWING IN THE WIND

**Presenter(s):** Webster, Jennifer; Caserio, Angelica

**Authors:** Webster, Jennifer; Caserio, Angelica; Keim, Elaine, Merry, Kyle; Herdt, Alexandria

Allergies, asthma, and respiratory tract infections are common ailments that many individuals experience throughout the year. Weather reports often include estimations of common allergens which may include pollen, dust, and even bacterial and fungal spores present in the air. In collaboration with the Departments of Biological Sciences and Geosciences (Atmospheric Sciences), we collected bacterial and fungal samples present in the air on calm versus windy days to describe our local "atmospheric microbiome." Control samples were collected once a month during a calm day. Other samples were collected on days with winds originating from the south, west or north with speeds of at least 25 miles per hour. These conditions can produce "blowing dust" and were utilized to maximize particulate matter collection. Samples were obtained by holding open agar plates into the wind at ground level and approximately 200 feet above ground. Plates were then closed, sealed, and incubated at room temperature for 48 hours followed by refrigeration to promote growth of all microbial species. Fungal and bacterial colonies were then processed and subjected to 16S rRNA and 18S rRNA sequencing to identify and quantify the microbial species present within the samples. While many types of bacteria and fungi appear to be consistently present within our samples, distinct differences were also observed. Wind speeds, direction, elevation, and time of year are all factors that influence microbial populations. In future studies, we hope to correlate the presence of specific microbes in the air with increased incidences of respiratory health conditions.
102. SYNTHESIS OF (S)-METHYLOXOBUTANOATE, ATROPANE ALKALOID INTERMEDIATE

Presenter(s): White, Gabrielle
Authors: White, Gabrielle; Seifert, Cole; Li, Guigen

Dr. John D'Auria, a Texas Tech professor of biochemistry, has isolated from the coca plant an unknown intermediate in the biosynthetic pathway for tropane alkaloids; strong evidence implies this intermediate is (S)-methyloxobutanoate. Producing this compound synthetically provides a standard that can confirm Dr. D'Auria's hypothesis. Since our research group is heavily focused in the area of organic synthesis, this provided an opportunity for collaborative research. To obtain the intermediate, we converted Cbz protected L-Proline to the corresponding prolinaldehyde through a mixed anhydride/sodium borohydride reduction followed by a Swern oxidation. A Wittig reaction produced the vinyl methoxy compound, which was then oxidized to the carboxylic acid via TCCA. A hydrogenation reaction over palladium on carbon and formaldehyde removes the Cbz protecting group and places a methyl group on the nitrogen. The final steps include the activation of the carboxylic acid with diimidazole carbonyl and the subsequent addition of methyl acetate enolate to yield the final product, (S)-methyloxobutanoate. Current testing by the D'Auria laboratory is underway to see if this compound corresponds to the compound isolated from the coca plant. Also, our synthesized compound can be fed to the biosystem for enzyme kinetics studies. If the tropane alkaloid biosynthetic pathway and its kinetics can be elucidated, this provides a launch point for research regarding commercial bioreactor synthesis of a variety of tropane alkaloids, many of which could be used for medicinal purposes.

103. RELATIVE ABUNDANCE OF SMALL MAMMALS AT MCGILLIVRAY AND LEONA MCKIE MUSE WILDLIFE MANAGEMENT AREA, BROWN COUNTY, TEXAS.

Presenter(s): White, Rowdy
Authors: White, Rowdy

Only a limited amount of small mammal research has occurred at Texas Parks and Wildlife Department’s McGillivray and Leona McKie Muse Wildlife Management Area in Brown County. This project was conducted to provide small mammal presence and relative abundance data in conjunction with TPWD’s Texas horned lizard translocation project located at Muse WMA following extensive brush control in the study area. Over the course of several nights during spring 2015, Sherman traps were placed in 40 m by 40 m grids. Sixteen of these grids were spaced across the study area to obtain 756 trap-nights. While this study was biased towards species most susceptible to capture in Sherman traps, I was able to identify the presence of 9 unique small mammal species in the study area. Of the species captured, deer mice (Peromyscus maniculatus) and hispid cotton rats (Sigmodon hispidus) were the most abundant (relative abundance = 0.74 and 0.14 respectively).
POSTER PRESENTATIONS

BUSINESS EMPHASIS

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BUSINESS
104. AN EXAMINATION OF THE EFFECTS OF PRIMING ON PRODUCT PERCEPTIONS

**Presenter(s):** Harris, Brooke  
**Authors:** Harris, Brooke; Condon, Miles; Rinaldo, Shannon B.; Popovich, Deidre

Priming refers to exposure to a stimulus which, if personally relevant, activates subconscious mental constructs that influence social perception and behavior. Research suggests that a powerful prime activates a person's self-concept. From a marketing perspective, we are investigating whether certain primes change consumer product evaluations. The objective of our experiments is to identify an appropriate prime (casual vs. sophisticated) for evaluations of wine labels, through data collection using Amazon Mechanical Turk. A pre-test asks participants to score wine labels on a scale from 1 (casual) to 7 (sophisticated). A label that consistently scores 4 (neutral) will be used for follow-up studies. In Study 1a, participants are randomly assigned to write about themselves when they felt either casual or sophisticated, which should activate their self-concept. Then, participants view the pre-tested label and answer questions about their product perceptions, willingness to pay, and expected satisfaction. We hypothesize that individuals whose sophisticated self-concept is activated will evaluate the wine as more expensive and favorable than those in the casual condition. In Study 1b, participants view pre-tested photos of a casual or sophisticated person, then write about the person and indicate how much they identify with them, which should activate the casual-vs.-sophisticated prime and their self-concept. Then, participants view the wine label and answer questions about the product. We hypothesize that individuals in the sophisticated condition will evaluate the wine as more expensive and favorable than those in the casual condition, and how closely participants identify with the photographed person will moderate this relationship.

105. NEURAL RESPONSES DURING EXPRESSIVE DISCLOSURE FOLLOWING A TRAUMATIC SERVICE ENCOUNTER

**Presenter(s):** Willis, Jordyn; Covington, Cole  
**Authors:** Willis, Jordyn; Covington, Cole; Rinaldo, Shannon

Neuroimaging techniques offer researchers new avenues through which to explore consumer behavior (Touhami et al. 2011). Functional near-infrared spectroscopy (fNIRS), or optical topography, is a non-invasive neuroimaging methodology that may allow access to previously inaccessible information about the cognitive processes underlying consumption (Ariely and Berns 2010). The fNIRS tracks changes in hemoglobin oxygenation in specific brain regions over time measured by infrared rays. Hemoglobin oxygenation typically increases in a brain region when it is recruited as part of a cognitive functioning (Ferrari and Quaresima 2012). Recently, fNIRS has been shown to be a useful tool for exploring how people process emotions and stressors (Balconi, Grippa, and Vanutelli 2015; Takizawa, Nishimura, Yamasue, Kasai 2014). I used fNIRS as part of a program aimed at understanding how consumers process traumatic service failure, which occurs when a product or service falls short of consumer expectations to such an extent that it can lead to prolonged stress (e.g., a medical misdiagnosis). According to research on expressive disclosure, people who write or talk about a traumatic event for as little as two minutes tend to report less negative affect and fewer negative health outcomes (Harris 2006; Pennebaker and Chung 2007). Participants in my study will privately describe either a traumatic or mundane service encounter for six minutes. I will compare changes in hemoglobin oxygenation levels during expressive disclosure and report significant differences and notable trends in the data.
106. "I DON’T NEED FEMINISM": A CONTENT ANALYSIS OF (DIS)EMPOWERMENT, SEXUALIZATION, AND BODIES OF WOMEN WHO HATE FEMINISM

Presenter(s): Finlayson, Benjamin
Authors: Christopher, Samantha; Purcell, John; Finlayson, Benjamin, Dalquist, Kristen; Heebner, Tori

BACKGROUND: Negative and inaccurate media portrayals of feminism has served as a barrier for women self-identifying as feminists for decades (e.g., Faludi, 1990). More recently, post-feminism has complicated the landscape by co-opting feminist concepts to promote consumerism and hyper-sexualization of women’s bodies under the guise of “empowerment.” Embedded in post-feminism is the belief that equality has been achieved and individuals are living lives directed by their own choices completely independent of social, political and cultural influences (Budgeon, 2001). These ideas coupled with media-fueled stereotypes of “second wave” feminists are linked to large numbers of young women who reject the feminist label (Aronson, 2003). Moreover, there exist groups of young women who not only disagree with feminism, but also forcefully denounce feminism. One such group is the "Women Against Feminism" (WAF) Facebook page. Method: To explore images and content associated with WAF, photographs with 800 or more “likes” on WAF facebook page were considered for analysis. Images were collected on September 14, 2014 between 10am and 12pm. This day was purposefully selected because, as far as we know, that day was not especially symbolic or relevant to women or feminism. Images and comments were examined using content analysis, focusing on the messages in the posts and how women’s bodies are sexualized and/or objectified within the context of feminist and post-feminist discourses.

107. THE IMPORTANCE OF THE CHARACTER LOKI, AS PORTRAYED BY TOM HIDDLESTON, IN POP CULTURE

Presenter(s): Greenlees, Samantha
Authors: Greenlees, Samantha

The character Loki has been around for over a millennia, yet his popularity has only increased over time. Why? To answer this, I will read through available Scandinavian history, Norse Mythology, Loki’s storylines through Marvel Comics and the Marvel Cinematic Universe, and annotate interviews with Tom Hiddleston and whomever else appropriate. My current research has shown that the character of Loki represents a part of humanity that we tend to do our best to ignore: the trickster in all of us that wants to go against the system. This trickster within us has allowed many characters such as the Joker from DC Comics to be popular in our culture. In the Mid-Twentieth Century Loki became a main antagonist in Marvel Comics. Despite reoccurring in many of the comics, his popularity did not hit the main stream until the release of Marvel Studio’s 2011 film, Thor. Loki was once again the antagonist; however, Tom Hiddleston’s performance as the famous trickster captured the attention of nearly everyone including those who had not even seen the film. Hiddleston’s performance did not have to rely on his personal good looks or charm - the audience became attached to Loki himself because of his upbringing and fate. Hiddleston’s Loki became not only important in pop culture, but the wind in Marvel Studio’s wings - from being the reason the Avengers assembled in Marvel’s The Avengers, to saving the shaky plot of Thor: The Dark World. Marvel has capitalized on Loki’s importance and continues to do so.

108. EAGERNESS FOR PHYSICAL ACTIVITY AS A PREDICTOR OF FREE PLAY IN ELEMENTARY SCHOOL CHILDREN

Presenter(s): Hiner, Matthew
Authors: Lochbaum, Marc; Ureno, Elizabeth; Hiner, Matthew

Daily physical activity is a major variable to combat the global obesity epidemic. Unfortunately, physical activity patterns begin to change (active to inactive) in the elementary school years. Thus, examining physical activity determinants in elementary children is important. One possible determinant is a child’s view of the importance of physical activity now and in their future. Recently,
the Eagerness for Physical Activity Scale (EPAS: Safvenbom et al. 2016) was developed in Norwegian samples. The present study sought to examine this scale in USA elementary students. To achieve this purpose, the EPAS was collected in 44 4th and 5th grade elementary students participating in a large after school program. Of those 44 children, 27 completed two activity sessions: structured and free play. Heart rate was recorded as the measure of physical activity intensity. It was hypothesized that during the structured session EPAS would not be related to activity. In contrast, it was hypothesized that EPAS would predict significant variance in the free play session that is children higher in eagerness for activity would have higher heart rates than children lower in eagerness for physical activity. The results supported our hypotheses as the EPAS accounted for no variance in structure play heart rate while accounting for 18% of heart rate in the free play condition. Thus, even in children, thoughts surrounding physical activity, present and future, determine significant and meaningful amounts of physical activity during free play. Future research should examine whether these thoughts are stable or malleable.

109. MAPPING THE WOMEN OF THE KU KLUX KLAN

**Presenter(s): Lewis, Dylan**

**Authors: Lewis, Dylan**

Over the past year, I have worked with Dr. Abigail Selzer King on her book project regarding the Women of the Ku Klux Klan (WKKK), an organization from the 1920s that had extensive ties to political and social structures around the United States. My poster details the location of organized WKKK groups (local and national) and event locations and sightings across the United States, as well as organizational hierarchy for the WKKK. This poster is a direct translation of archival data into a visual form, both physical and digital. Through this visualization, we can learn about how the group organized, recruited, and functioned. However, there are also many difficulties associated with the physical and digital visualizations of archival research. First, the information visualized is limited to the archival information collected, which is often largely incomplete and therefore misleading when visually represented. Furthermore, physical and digital representation is hard to accurately represent when the information is large-scale or requires different levels of observation. The visualization of hierarchical structures is often challenging because the exact hierarchy of a secret society is not always known or easy to accurately visualize, especially when you are considering a women's organization that both confronts and accepts traditional patriarchal structures. My poster shows how my work has been completed thus far, and offers solutions to many of the problems surrounding the visualization of historical archival research.

110. THE IMPACT OF TECHNOLOGY ON COMMUNICATION IN ROMANTIC RELATIONSHIPS

**Presenter(s): Stelly, Elizabeth; Smith, Melinda**

**Authors: Stelly, Elizabeth; Smith, Melinda**

The purpose of this study is to examine the relationship between technology as a form of communication and romantic relationships. Using a modified version of the Impact of Electronic Communication on Personal Relationships Instrument, this study seeks to measure the perceptions of individuals in current or past relationships regarding the impact technology has on communication in their romantic relationships. This study will identify currently used forms of communication, preferred forms of communication, and the influences of social media on romantic relationships. Insight will be provided to the reasons why certain forms of technology are preferred in communication with a romantic partner. Understanding the role of technology as a means of interaction between romantic partners will allow for a deeper understanding of possible barriers created by an individual's preferred form of communication in his or her romantic relationship.
111. ADVERTISING IN THE WEDDING INDUSTRY AND BRIDAL EXPECTATIONS

**Presenter(s):** Woodfield, Megan  
**Authors:** Woodfield, Megan

Advertising in the wedding industry is unlike advertising in other fields. It combines high emotions, tension, and pressures often stemming from cultural expectations of "having the perfect wedding," often enhanced by advertising. A number of previous studies examined the content of wedding advertising in general, but most have not examined how brides or brides-to-be responded to wedding advertisements. In this qualitative study, I interviewed seven brides or brides-to-be to discover their perceptions of wedding advertising and how it may have influenced their own wedding planning process. Questions were asked about their wedding details, their planning resources, and any pressures they felt regarding the wedding (and from where they felt these pressures). Then, I asked them to view and respond to specific wedding advertisements chosen from popular contemporary wedding magazines to elicit further detailed responses. Results indicated that brides felt some pressure to ensure their wedding matched their individual personality and that this then influenced how and what wedding advertising they consumed and incorporated into their wedding, which sometimes resulted in unwanted pressure to make their wedding as unique and special as possible.
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112. TECHNOLOGY IN EDUCATION

**Presenter(s): Bryan, Emily; Clemens, Stephanie**  
**Authors:** Bryan, Emily; Clemens, Stephanie

According to David Liu, COO of Knewton, “[Technology] can heighten the disparity between rich schools and poor schools, putting disadvantaged students even further behind because of lack of access to these tools.” Unfortunately, many school districts do not have the funds to provide technology to their students. This study speaks to the importance of provided technology so all students can gain experience with technology in their primary and secondary education, in order to be better prepare them for higher education. According to the data, students with self-efficacy in technology generally made them feel more prepared for college. The majority of the participants believed that some form of technology should be implemented in high schools nationwide, due to the convenience and efficiency it brings to the learning process. A common complaint among participants was the cost of technology and certain school’s inability to provide technology to all students. Our data was collected via multimodal survey design. The participants were students ranging from high school juniors to college seniors. The survey consisted of sixteen questions. The questions varied from yes/no, multiple choice, and short response. Our study is meaningful because it shows that students generally feel more prepared for college when they have experience with technology in schools. This study can be used to urge teachers to increase technology use in the classroom to better prepare students for the future, as well as push for increases in technology budgets for schools nationwide.

113. CHARACTERISTICS OF INDIVIDUAL’S ATTITUDES, NORMATIVE BELIEFS, AND CONTROL RELATING TO TEXTING WHILE DRIVING

**Presenter(s): Garza, Michael ; Moroz, Marissa**  
**Authors:** Garza, Michael; Moroz, Marissa; Coronado, Sirena, Flores, Raymond

Texting while driving has been identified as an unsafe but common practice. Using the theory of planned behavior (TPB) this study examined the characteristics of individual’s attitudes (i.e., perceptions about the safety of texting while driving), normative beliefs (i.e., perceptions about what others think about the safety of texting while driving), and control (i.e., perceived ease or difficulty of texting while driving) relating to texting while driving. Using the TPB we designed and developed a survey that was completed by a convenience sample of 90 participants. Results found that participant’s attitudes about safety of texting were the lowest (M= 1.59, SD=0.72), followed by normative beliefs (M=2.37, SD=0.79), and control was highest (M=2.44, SD=1.01). While 77.3% of participants believed that it is unsafe to drive while texting, in the past three months, 30.7% indicated that they had sent a text while driving with no passengers, 14.9% had sent a text while driving with passengers, and 26.5% had been a passenger with a driver who was texting. When asked about their future decisions related to texting while driving 13.8%, 26.7%, and 31.7% indicated that in the next three months they would likely text and drive with passengers, without passengers, and be a passenger with a driver who would text, respectively. Future research should examine the influence of each of these factors on individual’s decisions relating to texting while driving even after knowing the consequences associated with such behavior.

114. WOMEN AIR FORCE SERVICE PILOTS: AN ARCHIVAL LOOK AT THE WASP ORGANIZATION (1942-1944)

**Presenter(s): Hannah, Samantha C.**  
**Authors:** Hannah, Samantha C.; Edlin, Ashley H.

Under the command of Jacqueline Cochran, Nancy Harkness Love, and General Henry Arnold, the Women Air Force Service Pilots became the first women to fly military aircraft in the U.S. Sanctioned at the height of World War II, at least a thousand women volunteered as civilian pilots for the provisional Army Air Corp program. The WASP wanted to prove that women could be a valuable
asset to military operations. The primary goal of this project is to build a comprehensive timeline of the WASP’s accomplishments, goals, primary members, and to explore their historical significance. The WASP timeline will focus on 1942-1944, as these were the years that they were active. Previous years have shown that WASP have not been acknowledged and recognized for their brave sacrifices. Compiling artifacts for these given years and focusing on WASP significance within the ranks of the Air Force will be a major component of commemorating and honoring these women and their accomplishments.

115. HUMAN TRAFFICKING: A PERSPECTIVE FROM COMPUTER SCIENCE AND ORGANIZATIONAL LEADERSHIP

Presenter(s): Sparks, Turner
Authors: Sparks, Turner

With human trafficking plaguing our society, it is obvious the measures taken thus far are not adequate in solving the problem. An interdisciplinary technique is necessary to address human trafficking, because it is a complex issue that is a serious societal concern and has not been resolved. Repko’s 10 step Interdisciplinary Research Process was used to provide a better understanding of the issue. Based on an extensive literature review, it was found that perspectives from Computer Science and Organizational Leadership together can provide valuable insights. Better surveillance and tracking software can be developed, and appropriate strategies can be created to utilize the software to the best potential. The current software works well in controlled environments, but the video sensors we have today are not ideal for real world applications. Law enforcement officers do not have adequate training in dealing with human trafficking, and there aren’t many regulations to protect citizens’ privacy and safety when it comes to video surveillance. In order to overcome these obstacles, further development of video surveillance technology and more extensive training in regards to human trafficking should be the focus for future research and development on this topic.

116. ARE TEACHERS READY FOR INCLUSION?

Presenter(s): Teweleit, Lindsay; Cai, Keeley
Authors: Teweleit, Lindsay; Cai, Keeley

Inclusion classrooms are designed to integrate students with disabilities into the general education classroom. Inclusion classrooms are becoming more popular, but teachers need to be adequately trained in order to effectively teach diverse types of students. An online survey was distributed to inservice and preservice teachers in the Lubbock area in order to answer the question: do current educators feel adequately prepared to create a conducive learning environment for all students in an inclusion classroom? The results of the survey thus far have shown that 1 in 5 of inservice teachers, and 3 in 7 preservice teachers feel that they have received enough training to be successful. Overall a total of 75% of educators feel prepared to teach in an inclusion classroom. When asked what prepared educators the most to work in an inclusion classroom, the number one answer was experience. The survey suggested that in order to be more prepared educators need clear communication between special education and general education teachers, and more training on how to modify lesson plans to fit a wide variety of learning styles and abilities. For the most part the teachers are prepared to teach, but they seem to need more tools and resources in order to effectively teach in an inclusion setting.

117. MALES IN EDUCATION: MOTIVATION FOR SELECTING TEACHING AS A CAREER

Presenter(s): Wharton, Brittany; Eubank, Stephanie; Sixtos, Lori
Authors: Wharton, Brittany; Sixtos, Lori; Eubank, Stephanie

There is an astounding total of 900,000,000,000 teachers in the world. From this group, a total of 3.5 million are teachers in the United States. From this total of teachers in the US, 76% are women. Thus 24% of teachers in the US are men. Based on the above statistics, it is apparent that the teaching
profession is dominated by women. The above statistics pose a salient question. Namely, why do men select teaching as their career? Specifically, this survey research was designed to ascertain what are the factors that motivate men to select teaching as their career? The participants for this study were male undergraduates majoring in education at a university located in the southwest during fall, 2015. The demographic data obtained from the participants indicated that the majority planned to teach in middle-upper secondary schools. In response to the research question, the participants responded that a motivating factor in their career choice was the opportunity to coach. When asked what might encourage more men to enter the teaching profession, the respondents indicated higher wages for teachers (in 2012-2013 the average salary for teachers was $56,383). Thus based on this survey research, the opportunity to coach and higher salaries were reported by the participants as motivating factors for their selection of teaching as their career.
118. EFFECTS OF HAIL IMPACT DAMAGE ON THE CORROSION BEHAVIOR OF ROOFING GRADE GALVANIZED AND GALVALUME STEEL

**Presenter(s):** Adeyi, Oyebode; Millican, Matthew

**Authors:** Meduri, Chandrasehkar; Adeyi, Oyebode; Millican, Matthew, Ton-that, Kevin

Galvanized (Zn) and Galvalume (55% Zn-Al) corrugated steel panels are the most widely used roofing materials in the construction and storage industry due to their high strength-to-weight ratio, corrosion resistance, and relatively low cost. Expected service life of 26-gauge hot-dip-galvanized and 55% Zn-Al coated steel panels are 30 to 50 years. However, the possibility of hail impact can drastically reduce the service life because of the damage to the galvanized layer and the ensuing corrosion and embrittlement of the hail struck regions. The objective of this study was to determine the effect of different degrees of hail impact damage on the corrosion behavior of galvanized steel panels.

Controlled hail impact was performed per FM 4470 and FM 4473 test protocol in a laboratory. As-received and hail-damaged specimens were subjected to constant tensile stress while completely immersed in a 3.5% NaCl solution to accelerate the corrosion process. Corroded samples were then subjected to standard three-point bend tests to determine the effect of hail impact on the strength and crack resistance of hail-struck specimens as compared to non affected material. Surface features of the hail-struck regions were characterized via SEM and stereo microscopy.

119. REVERSIBLE TRAPPING OF CAENORHABDITIS ELEGANS IN A MICROFLUIDIC TRAP FOR IMAGING LIVE ANIMALS.

**Presenter(s):** Albus, Kimberly;

**Authors:** Albus, Kimberly; Rahman, Mizanur; Bithi, Swastika, Vanapalli, Siva

Caenorhabditis elegans (C. elegans) is a widely used experimental model for biological research due to its short lifespan, fully sequenced genome, genetic tractability and transparency. Being transparent in particular has opened a wide range of research areas dealing with gene expression, function of the protein and localization of proteins through the use of fluorescent markers. Usually this requires using long exposure times for capturing the fluorescence. A very active C.elegans must be immobilized in order to image gene expression or physiological parameters (pharyngeal pumping, etc.) or examining anatomy. Currently, the way to do this is by immobilizing the worm using an agar pad and placing the worm between two glass slides. This process is tedious, sometimes resulting in either injury of the animal, making it unavailable for analyzing at a later time point. As a result, imaging data for a particular assay is rarely available in a longitudinal fashion. In an effort to avoid this, we propose a new microfluidic bench-top use device that will "trap" the C. elegans such that we can look at them, collect data, and release them unharmed. We optimize flow rate and initial worm concentration to achieve maximum trap efficiency. We observed post imaging recovery of a large fraction of trapped worms. As a proof-of-principle, we use our microfluidic device and visualize green fluorescent protein tagged myosin in the sarcomeres of the worm muscles.

120. PRESSURE DROP OF A TRAIN OF CONFINED MICROFLUIDIC DROPLETS

**Presenter(s):** Anazia, Kosi

**Authors:** Anazia, Kosi; Suteria, Naureen; Vanapalli, Siva

Microfluidics is the study of fluid manipulation on a micron scale. It has become a popular research tool in recent years due to the ease of fabrication and low cost of materials and reagents. Microfluidic devices are used in many areas, from studying cell biology to enhancing chemical synthesis. They are commonly made using soft lithography, which requires specialty equipment such as a spin coater and mask aligner. When inadequate equipment is used or unintentional errors are made, they can result in features with non-rectangular channels. Since microfluidics is a field that leaves no room for error, we want to show what effect these imperfections have on the accuracy of the device. We use a simple, well-established pressure measuring technique called a comparator to measure the pressure drop of a confined microfluidic droplets in a train. We compare the measurements made in devices
with either a square cross section, or an intentionally irregular cross-section we call a ‘trapezoid’. Our results show that at low capillary number (Ca less than 0.03), pressure drop is the same in both square and trapezoid cross sections but at higher capillary numbers (Ca greater than 0.03), pressure drop in the trapezoid channel is greater than that in the square channel. This supports our claim that minor variations in channel cross section can affect pressure drop. In the future, we hope to do more of these experiments on other devices made out of a mechanically rigid material in order to determine how much elastic deformation affects pressure drop measurements.

121. MAGNETISM, FLUCTUATIONS, AND MUON DYNAMICS IN VO2:Ti 5 AT%

Presenter(s): Ballinger, Daniel

Authors: Mengyan, P.W.; Lichtie, R.L.; Ballinger, T.D.

Pure vanadium dioxide (VO2) has a reversible metal-semiconductor transition (MST) near 340K that is accompanied by a structural transition from the rutile (T greater than 340K) to monoclinic (T less than 340K) phase. This ultrafast transition comes with a sharp change in optical properties, band gap (from ~0 eV to ~1eV) and a several order of magnitude increase in resistivity. It can be triggered thermally, optically, electrically or application of pressure. The transition temperature can be modified by introducing impurities into an otherwise stoichiometric VO2 system. Impurities such as tungsten and titanium decrease the MST temperature. When implanted in a bulk material, 100% spin polarized muons (+q, S=1/2, lifetime ~2.2 us, 1/9 mass of proton) function as a local magnetic probe. By characterizing the local magnetic environment in pure VO2 and a series of VO2 doped with different concentrations of Ti, we should be able to develop significant insight into the role that dopants may play in the mechanism that drives these transitions in VO2. Despite decades of research, this mechanism is still a highly debated topic. In this particular contribution, we report results from muon spin rotation and relaxation measurements on VO2: Ti 5at%, where we have characterized a previously unknown magnetic phase and fluctuations in the local environment that appear to be related to transitions (MST and magnetic) into each state.

122. COMBUSTION CHARACTERIZATION OF NANO PARTICLE REACTIVE MATERIALS SUSPENDED IN POLYMER BINDERS FOR USE IN ADDITIVE MANUFACTURING

Presenter(s): Cox, Jennifer

Authors: Cox, Jennifer; Clark, Billy; Pantoya, Michelle

The last decade has seen the interest in additive manufacturing of items increase drastically. Several processes including fused deposition modeling, stereo lithography, laser sintering, laser melting, and even various vapor deposition methods are all currently used for additive manufacturing of various materials. This study examines the use of an extrusion process, blade casting, to enable additive manufacture of an energetic film that is free standing once cured but sustains an exothermic reaction once ignition occurs. Three polymer binder solvent systems were chosen for use in this study, these were a tin cured polydimethylsiloxane silicone and xylene, epoxy resin and xylene, and acrylonitrile butadiene styrene, ABS, and acetone. The base energetic used in all synthesized films was aluminum and molybdenum trioxide with potassium perchlorate used as an oxidizing additive. The mass of the energetic materials was held constant for all films tested. The mass percent binder was increased from ten percent to fifty percent in order to establish the effect the binder has on the flame speed of the cured films. All films were blade cast at 1.0 mm thickness with constant volume percent solids. The films were then burned in an unconfined test apparatus and the flame propagation was recorded with a high speed camera. The results from the flame speed testing showed that as the mass percent binder is decreased the flame speed of the films increased with twenty mass percent ABS having the highest flame speed of 1.24 cm/s. Since the binders are participating in the reaction this increase in flame speed is attributed to the fuel-oxidizer ratio approaching an optimum ratio as the binder, a fuel, is removed. In addition, at the higher mass percents binder there is not enough oxidizer to completely react with the binder, thus the non participating binder acts as a heat sink drawing heat from the reaction. These extrusion synthesized films are attracting attention due to their ability to be used in fused deposition methods of additive manufacturing allowing on demand energetic manufacturing.
123. TIME SERIES MODEL ANALYSIS OF WEST TEXAS INTERMEDIATE CRUDE OIL PRICES

**Presenter(s):** Dao, Mai  
**Authors: Dao, Mai**

Crude oil is one of the most important and commonly used commodities in many sectors, especially energy. Because of its widespread applications, crude oil prices are of high interest. The objective of this study is to fit a time series model to the crude oil prices and use it to make forecasts within reasonable confidence intervals. To achieve this, available past data of West Texas Intermediate (WTI) crude oil prices are used to simulate and generate automatic forecasting values using the R Studio computer program. The experimental autoregressive time series models include the ARIMA, APARCH, and GARCH models. Different data frequencies are subjected to closer observation of their effects on the time series analysis. Previous research has shown that different data sets will be compatible with different models, and that no single model works well in every situation, but rather their combination version will yield better forecasting results. In this study, it is expected that the APARCH/GARCH combined model will outperform the other separate models.

124. PREDICTING HOW RANAVIRUS AFFECTS THE CHIRICAHUA LEOPARD FROG

**Presenter(s):** Harper, Adam  
**Authors: Harper, Adam; Peace, Angela**

According to Earl and Gray (2014), local wood frog populations have been predicted to decline and even die off due to ranavirus exposure under certain conditions. Wood frogs (Lithobates sylvaticus) were projected to die off in as little as 5 years if the larval or metamorph life stages were exposed to ranavirus every year. The same could also be true for the Chiricahua leopard frog (Lithobates chiricahuensis). The purpose of this research is to determine if the Chiricahua leopard frog, an endangered species, could go extinct when exposed to ranavirus. This research further asks that question for two strains of ranavirus, Frog virus 3 (FV3) and Ambystoma tigrinum virus (ATV). We hypothesize that, because the Chiricahua leopard frog is listed as an endangered species, there will be possible, and probably faster, extinction scenarios given different levels of ranavirus exposure. We determine this by using a discrete time, age-structured matrix model, or a Leslie matrix model parameterized with estimates of a natural population of Chiricahua leopard frogs. In order to find long term growth rates, we solve the characteristic equation of the system of equations described by the Leslie matrix. The long term growth rate is then used to solve a system of equations taken from the Leslie matrix to give the long term, age-structured population. Further analytical and numerical (matlab simulations) analysis predict extinction scenarios.

125. THE BENDING OF BULK METALLIC GLASS

**Presenter(s):** Herrera, David  
**Authors: Kumar, Golden; Hasan, Molla; Meduri, Chandra Sekhar, Herrera, David**

How do plasticity of Zr-based bulk metallic glass, change with temperature? The temperature used in the experiments varied from liquid nitrogen to 300 degree Celsius. To accomplish our goals we used lab equipment to cast and polish our sample to a specific thickness, width, and length so that the geometry of the sample would not vary. We then used an Instron machine to bend the specimen using a pre-structured mandril at different temperatures. Using the SEM (scanning electron microscope) the number of shear bands, which is the product of bending the specimen and is significant to the determination of the plasticity, were counted on a micro scale. The results found were that as the temperature increased the number of shear bands decreased. Another important factor to be analyzed was the relation of strain and shear bands. The lab group expected that as the strain increased the number of shear bands would increase which was supported by the experimental data. Furthermore, using the SEM images to analyze the surface of where the fracture occurred, the ductile-to-brittle transition was shown to exist in the range of temperatures used in the experiment. Starting with the room temperature, the fracture is very random at the surface which
indicated a brittle fracture, and the higher temperatures gave fractures closer to a cup-cone shape which indicated a ductile fracture. The purpose of the research was to find the correlation between plasticity and temperature which was supported by evidence during the experiment.

126. LIFTING MOTIONS DURING PATIENT REPOSITIONING IN NOVICE AND EXPERIENCED NURSES: A PILOT STUDY

Presenter(s): Holmes, Abigail

Authors: Holmes, Abigail; Opella, Jessie; Cloutier, Aimee, Yang, James

According to the Bureau of Labor Statistics, in 2014 nursing and residential care facilities had the highest incidence rate of total nonfatal occupational injury cases in the U.S. Most work-related back disorders in nurses are related to patient transfers, and manual patient handling tasks result in high lumbar load. The present pilot study seeks to determine if there are significant differences in the motion of experienced nurses and novice nurses while performing the same patient repositioning tasks. A motion capture experiment was conducted in a laboratory setting on 15 female nurses performing two patient repositioning tasks (moving patient toward the head of the bed; transferring patient from bed to a wheelchair). Of the nurses selected, 8 were experienced nurses (greater than 5 years of nursing experience), and 7 were novice nurses (between 0 and 2 years of nursing experience). The motion capture data were post processed using Cortex and Visual3D software. Key joint angle profiles will be compared between the novice and experienced nurses. The hypothesis is that the novice and experienced nurses will have different motions for the same patient reposition task. After the data analysis is completed, the results will be used to test our hypothesis. Data post process is still ongoing. Future work will utilize these findings to develop and validate a generic optimization and reliability-based methodology to predict optimal body dynamic motions for individual nurses and other workers to prevent injuries under uncertainty during load handling.

127. THE EFFECT OF NANOCATALYST PARTICLE SIZE ON MASS TRANSFER RATES

Presenter(s): Jordan, Matthew

Authors: Jordan, Matthew; Wiesner, Theodore

Nanocatalysts serve in a number of chemical process applications for the petroleum and chemical industries. However, many aspects of the nanoscale still remain unknown. Current mass transfer models do not extend into the nanoscale region and previous research findings conflict on the nanoparticle effect. The aim of this research project is to determine the effects of nanocatalyst particle size on the mass transfer rate. The reduction of ferricyanate with potassium iodide was selected as the model reaction due to the mass transfer control of the reaction rate. A series of experiments were conducted with varying nanocatalyst particle sizes, while holding catalyst surface area constant. Reaction rates were measured over a 150-minute duration through spectrophotometry. Results obtained correlate decreasing particle size to an decrease in reaction rate. This contrasts with the existing view that nanoparticles become more reactive as particle size decreases, due to increasing surface to volume ratio. As a result of these findings, future work will investigate the effects of the surface ligands on the nanoparticles as a possible explanation of these findings.

128. DUST IN THE WIND: A STUDY ON THE ORIGIN AND COMPOSITION OF PARTICULATE MATTER IN LUBBOCK

Presenter(s): Keim, Elaine

Authors: Keim, Elaine; Merry, Kyle; Vanos, Jennifer, Herdt, Alexandria

The wind blowing into West Texas brings dust and other forms of particulate matter, bacteria, pollen, and spores of fungi. With collaboration between the Departments of Biology and Geosciences at Texas Tech, an ongoing research study was designed to determine not only the bacteria and fungi present in the blowing dust, but also where the microbes and the blowing dust originated. Control samples were collected once a month, while experimental samples were taken when the wind speed
129. EVALUATION OF 3D PRINTED SOFT FINGERTIP GRASPING ABILITY FOR VARIABLE FINGERTIP SHAPE, LAYER THICKNESS, AND MATERIAL SHORE HARDNESS

**Presenter(s):** Ly, Khoi

**Authors:** Ly, Khoi; Cloutier, Aimee; Yang, James

Early designs of artificial fingertips include only rigid materials, leading to poor performance on grasping tasks, partially due to small rigid contact areas between the fingertips and the objects. Including soft materials provides larger contact area between the fingertips and object, improving grasp stability and ability to manipulate objects. In literatures, various attempts have been made to design soft artificial fingertips that can exhibit grasping ability as close human fingertips as possible. Previous literature has shown that silicone rubber was considered the best material for grasping performance, but there has been no systematic investigation of how design parameters affects fingertip performance. In this research, 30 3-D printed prosthetic fingertip prototypes are created based on three varied parameters: five shapes based on flatness/roundness of the fingertip, three thicknesses of the soft layer which represents fat, and two shore hardness indexes of the silicone rubber. The grasping performance of these 30 prototypes is tested using a custom built three-axial linear actuator experiment device. The objective of this research is to identify what combination of three parameter values results in best fingertip grasping performance.

130. KNOWLEDGE REPRESENTATION, REASONING, AND THE DESIGN OF INTELLIGENT AGENTS

**Presenter(s):** Miller, Jackson

**Authors:** Miller, Jackson

Knowledge representation and reasoning is a branch of science in the field of artificial intelligence that focuses on the design of intelligent agents. Intelligent agents are software systems capable of exhibiting intelligent behavior. The purpose of intelligent agents is to create a system that can solve complex computational problems using knowledge about the environment and rules on how to apply this knowledge. One solution is Answer Set Prolog, a declarative programming language that can be used to precisely describe an intelligent agent. When given a mathematical model of its environment and descriptions of its abilities and goals, an intelligent agent should be able to orient its work to achieve these goals. An agent should also be able to adapt to a changing environment and be capable of achieving its goals with minimal to no human control. Intelligent agents can be used in practical intelligent systems that create programs for many applications such as more efficient search algorithms and smarter robots. Additionally, intelligent agents can lead to a better understanding of the process of thought and to new discoveries in human cognitive ability.
131. DATA ACQUISITION FOR HIGH ENERGY LLANO ESTACADO DETECTOR (HELADO) COSMIC RAY OBSERVATORY

Presenter(s): Mills, Casey
Authors: Mills, Casey; Akchurin, Nural; Cowden, Chris; Hefele, John

The HELADO cosmic ray observatory intends to use large reflective surfaces and photomultiplier arrays for the detection of Cherenkov photons from high-energy gamma ray showers. Methods to extract characteristic features of air showers are being developed to determine the direction and energy of initial gamma rays. We present preliminary studies leading to the development of data acquisition software and hardware for the HELADO ground satellite dish that will be placed at the Texas Tech University Observatory. After completion and testing of the data acquisition system using mostly background events, we plan to implement a smart trigger system based on Monte Carlo simulations that we have already developed.

132. APPLICATION OF BAYESIAN STATISTICS TO IMPROVE PATIENT CARE

Presenter(s): Noble, Allison
Authors: Noble, Allison

Effective and efficient patient care is of great importance to the health care industry and to our country. Healthcare can be revolutionized using developing technologies and through careful analysis of industry processes and procedures. The objective of this research is to explore the possibilities of incorporating technology, engineering expertise, and statistical models to improve patient care. This study explores the application of Bayesian Statistics, Industrial Engineering concepts, and ideas from the Institute for Healthcare Improvement to improve patient admittance and care effectiveness. A study has been done to predict the number of patients admitted to a hospital inpatient unit based on the number of patients admitted to the emergency departments using Bayesian Statistics. A literature review and individual research was conducted, and a course from the Institute for Healthcare Improvement was completed to gain a greater understanding of how to improve patient care.

133. DEVELOPMENT OF A MATHEMATICAL MODEL TO INVESTIGATE THE PRODUCTION OF HYDROGEN FROM SOLAR WATER SPLITTING USING SURFACE PLASMON RESONANCE

Presenter(s): Obianyor, Chiamaka
Authors: Obianyor, Chiamaka; Wiesner, Theodore

The use of solar energy as an alternative source to fossil fuel, though lucrative, poses problems due to the sun’s unpredictability. The energy must be stored for use when sunlight is unavailable. Hence, the splitting of water to produce hydrogen using solar energy is being explored. Although recent experiments show that the use of plasmonics in solar splitting of water enhances the production of hydrogen, a theoretical and mathematical linkage describing this is lacking. In this project, a mathematical model for a photoelectrochemical cell (PEC) that incorporates the relevant mechanisms of water splitting including, plasmon-resonance energy transfer, hot electron and hole transfer, contact effects, and electrocatalysis, will be produced using Mathematica software. Using titanium oxide as semiconductor, the continuity equation will be solved for electrons and holes in the spatial domain of the semiconductor. The electric field spectral density will be computed from Maxwell’s equations and used to calculate exciton generation. The results of our work will enable further parametric analysis on this subject, and provide clear theoretical predictions as to the relative importance of each mechanism.
134. UNDERSTANDING AVAILABLE COEFFICIENT OF FRICTION AND PREDICTION OF SLIP PROBABILITY FOR RAMP WALKING

**Presenter(s):** Opella, Jessie

**Authors:** Opella, Jessie

Slips and falls cause 15% of all accidental deaths and 25% of workplace injuries. More slips and falls occur on ramped surfaces than level surfaces, but little data exists on how the available coefficient of friction (ACOF) for ramped surfaces affects the likelihood of slip and fall. To investigate this phenomenon, measurements of ACOF are taken on two floors using a BOT 3000. The surfaces are first tested to ensure the ACOF is between 0.5 and 0.9 due to equipment limitations. Additionally, due to the realistic nature of the experiment, a fall or slip on a surface with an ACOF greater than 0.9 is very unlikely. Then each untampered, level floor surface is tested 200 times. Note that the ACOF does not change with the angle of the ramp but with the surfaces in contact. The collected data are used to determine the distribution type and thus used to predict the likelihood of a slip or fall for ramp walking. The results show that the generalized extreme value distribution is the best fit for the ACOF and the proposed formulation can predict the probability of slip for ramp walking. This knowledge can then be used to develop and improve ramps to reduce slips and falls.

135. USING DECLARATIVE PROGRAMMING IN AN INTRODUCTORY COMPUTER SCIENCE COURSE FOR HIGH SCHOOL STUDENTS

**Presenter(s):** Perez, Cynthia

**Authors:** Reyes, Maritza; Perez, Cynthia; Upchurch, Rocky, Yuen, Timothy; Zhang, Yuanlin

Though not often taught at the K-12 level, declarative programming is a viable paradigm for teaching computer science due to its importance in artificial intelligence and in helping student explore and understand problem spaces. This paper discusses the authors’ design and implementation of a declarative programming course for high school students during a 4-week summer session.

136. A NOVEL APPROACH TO PUZZLE SOLVING

**Presenter(s):** Sastry, Shashidhar

**Authors:** Sastry, Shashidhar

The choice of a programming language plays a crucial role in the design of programs. Answer Set Prolog (ASP) is a relatively new programming language that has proven useful in solving certain families of problems. A Sudoku Solver, for instance, can be written much more simply in ASP than in some of the well-known programming languages including C, C++ and Java. In this experiment, we will focus on a logical game called ?Akari? or more commonly as ?Light-up.? Two programs will be written - one in ASP and the other in C++ - each designed as an Akari Solver. The programs will then be analyzed. We will examine the simplicity of writing and the ease of reading the program. Additionally, we will look at the method of determining the correctness for each of the two programs. The C++ code is expected to be more complex than the ASP code.

137. INFLUENCE OF SMOKE ON GERMINATION OF GRASSES IN NORTH AMERICA

**Presenter(s):** Smith, Ian

**Authors:** Smith, Ian; Cox, Robert D.

Smoke exposure is known to influence germination of a wide variety of species. However, the influence of smoke on germination of grasses is poorly studied. In order to investigate the influence of smoke on grasses native to North America, we tested six species for their germination response to smoke exposure. Species tested were: side oats grama (Bouteloua curtipendula), blue grama (Bouteloua gracilis), Thurber’s needlegrass (Achnatherum thurberianum), bluebunch wheatgrass (Pseudoroegneria spicata), and Sandberg’s bluegrass (Poa secunda). Seeds were treated with one of four dilutions of smoke-water and distilled water: 0:1 (no smoke), 1:10 (high smoke), 1:100 (medium
smoke), and 1:1000 (low smoke). Seeds were soaked in the smoke treatment for 20 hrs, then placed in a germination chamber programed to 35 degrees Celsius on the high end and 20 degrees Celsius on the low end, with the lights programmed to cycle every 12 hrs per day. We then monitored the seeds daily for germination. We found that germination was inhibited in some species and promoted in others. For example, germination of bluebunch wheatgrass was stimulated at the medium smoke level, while Thurber’s needlegrass was non-responsive to all levels of smoke. On the other hand, blue grama was inhibited at only the low smoke level, while sideoats grama was inhibited by all levels of smoke. It is apparent that smoke does have a significant effect on germination of many grass species in North America.

138. THE POWDERS THAT KNOW

**Presenter(s): Smith, Logan**

**Authors: Smith, Logan**

Explosives have become an integral part of both safety and entertainment in our lives. One concern with the storage of energetic materials is that accidental fires happen everywhere, and a warehouse full of explosives is not a place you want getting hot. Research has been done in an attempt to combat this problem by introducing additives with different mechanisms to inert the combustion reaction in the event of an accidental fire. Unfortunately, until now, the additives used were not plausible because of their carcinogenic effects. We hope to continue this research in hopes to finding a more eco-friendly solution, while still making the reaction inert if an unwanted fire were to occur.

139. STUDY OF PLANAR-TYPE AND MESOSTRUCTURED ORGANO-METAL HALIDE PEROVSKITE BASED PHOTOVOLTAICS: FABRICATION AND CHARACTERIZATION

**Presenter(s): Stoneham, Elizabeth**

**Authors: Stoneham, Elizabeth**

Solar energy is the most abundant source of clean energy on earth. Solar cells are devices that absorb solar light (photons) and convert it to electricity in a so-called photovoltaic process. This requires materials that can absorb the most sunlight, efficiently convert the absorbed photon energy into electricity, and are cost-effective to manufacture. Recently, an exciting new class of photovoltaic materials, organo-metal halide perovskites, have emerged and show strong promise to revolutionize the photovoltaic industry in the near future. The objective of this NSF-supported research is to develop a solution-based process to fabricate the planar structure type perovskite solar cells and characterize their electrical, optical, and photovoltaic properties. In our preliminary study, PSCs with an efficiency of ~ 12% have been demonstrated. Additionally, we developed the process to fabricate mesostructured perovskite solar cells by using TiO2-based mesoporous structure that facilitates the perovskite solution deposition. In this presentation, the device fabrication process and characterization will be reported.

140. SELECTIVE ION REMOVAL FROM BRINE WATER WITH CHEMICALLY MODIFIED ELECTRODIALYSIS PROCESS

**Presenter(s): Vue, Jon**

**Authors: Vue, Jon; Swope, Paul**

The objective of this study is to develop a class of chemically-modified electrodialysis (ED) membranes to achieve more selective removal of Ba2+ from synthetic brine water. For this study, the performance of ED membranes was tested on a bench-top four-chamber ED unit. The original ED membranes and those that have been deposited with a layer of derivatized crown-ethers were evaluated. Each experiment starts with a brine solution of known initial concentrations of Ba2+, Na+, and other co-ions and counter-ions. Total voltage and current applied to the ED stack and the conductivity of diluate and concentrate were recorded. In addition, small samples were taken from the diluate tank at regular time intervals for analysis of the concentrations of cations with atomic
absorption spectrometry. In order to optimize the electrodialysis process, different variables were tested, which included different cation-exchange membranes, concentrations of co-ions, and presence of other contaminants. In the testing of the co-ions, magnesium chloride (MgCl2) was added. For the last variable, water-soluble crown ether was added to the diluate. Data from these experiments suggests that moderate enhancement in barium removal selectivity can be obtained with crown-ether-modified ED membranes. Furthermore, the selectivity is not affected by the presence of co-ions (Mg2+). Further study is on-going to evaluate the effects of chemical modification parameters and the solution chemistry on the efficiency of the proposed ED process.

141. TRACE ELEMENT SIGNATURES IN CARBONATES FROM CALC-SILICATE ROCKS IN THE THERMAL AUREOLE OF THE BALLACHULISH IGNEOUS COMPLEX

**Presenter(s):** Washburn, Alex

**Authors:** Washburn, Alex; Hetherington, Callum J.

The role of fluids in metamorphic processes is well documented, and their impact on accessory mineral texture development and trace element distribution, particularly in silicates, is increasingly well understood. In this study textures in metamorphic carbonates from the aureole of the Ballachulish Igneous Complex are correlated with CL response and trace element abundances to establish textural and compositional relationships in complexly zoned carbonate minerals. Carbonate in samples consist of dolomite and calcite, while silicate portions are dominated by feldspars, and a mixture of neso- and ino-silicate minerals. Low temperature carbonate assemblages are finer grained, with calcite forming very fine-grained aggregates around dolomite. The dolomite grains may be larger with calcite veins, or small grains with ternary junction grain boundaries. Both silicate and calcareous sub-domains contain apatite, zircon, rutile, sphene, pyrite, and monazite. The low temperature calcite has orange CL, while dolomite is red. Dolomite grains are compositionally zoned with Mg-rich cores and more calcic rims, which have brighter orange luminescence. The calcite veins are identified by their strong, contrasting CL response compared to host dolomite. High temperature samples are coarser grained, have significantly fewer accessory minerals, and are characterized by silicate-mineral veins and inter-growths. Grain boundaries between calcite and dolomite are straight, except near veins of silicate minerals where calcite occurs as very fine-grained aggregates. Silicate minerals inter-grown with calcite have curved grain boundaries and no preferred orientation. Calcite and dolomite grains have orange and red CL respectively, but both minerals show a brightening of CL response at their grain boundaries, which weakly correlate with trace element abundances. It is proposed that CL zoning in dolomite and calcite represent recrystallization textures that grew during emplacement of the igneous complex, and their increased CL response reflects the accommodation of changing abundances of trace elements, some of which may have been released into the bulk-rock system upon the breakdown of accessory minerals, which become increasingly rarer at higher temperatures.

142. COMPUTATIONALLY IMPROVING MICROSCOPIC IMAGE RESOLUTION THROUGH FOURIER PtyCHOGRAPHY MICROSCOPY AND FOURIER PLANE IMAGING MICROSCOPY

**Presenter(s):** Zhelyeznyakov, Maksym

**Authors:** Zhelyeznyakov, Maksym; Grave-de-Peralta, Luis; Desai, Darshan

A fundamental method performed by various laboratories is their use of optical microscopes for imaging. The resolution of a compound microscope, as well as other optical imaging devices is however limited by diffraction, known as the Rayleigh Resolution Limit, which is approximately 200 nm for modern microscopes. There is a strong need in the sciences for optical imaging techniques capable to resolve structures on the order below the Rayleigh Resolution Limit. Fourier-optics provides a possible solution to this problem. By studying the Fourier-Plane of a compound microscope, our group has developed a novel imaging technique that is capable of resolving periodic structures below the Rayleigh Resolution Limit.
143. THE MINIMUM COST OF A NUTRITIOUS DIET IN EL SALVADOR

Presenter(s): Alfaro, Edytha
Authors: Alfaro, Edytha; Carpio, Carlos; Sandoval, Luis

One of the pillars of food security is food access, which according to the World Health Organization is having sufficient resources to obtain appropriate food for a nutritious diet. The poverty conditions of El Salvador seriously affect this pillar. It is estimated that 31.9% of households live in poverty conditions and 24% of those households do not have enough income to acquire the basic food basket (Economy Ministry, 2015). This raises the question: what is the cost of acquiring the minimum required nutrients for an active and healthy life in El Salvador? Thus, the main objective of this research is to estimate the minimum cost diet for the representative household. We will use linear programming techniques to estimate the monthly cost of the minimum cost diet from 2012 to 2015, and to obtain the food items that compose the diet. Prices will be obtained from the Consumer Protection Agency of El Salvador, the nutritional composition of the food items from the Food Composition Table for Central America and Panama of INCAP (Central American and Panama Institute of Nutrition) and the nutritional recommendations from the Human Energy, Vitamin and Mineral Requirements reports (FAO/WHO, 2004 and 2002). With this research we will gain a better understanding of the state and dynamics of the food access pillar of food and nutrition security in El Salvador. The results of the study can be used to assist the implementation of nutrient supplementation programs, school lunches and to create food packages for emergency situations.

144. WILL THIS COOKIE MAKE ME FAT: IMPACT OF WEIGHT DISSONANCE AND GENDER ON DISORDERED EATING BEHAVIORS

Presenter(s): Bartlik, Andrew
Authors: Bartlik, Andrew; Dsauza, Cynthia

It is widely known that eating disorders are rife in a college environment. The objective of this study was to examine the relationship between weight dissonance (difference between reported current weight and ideal weight) and symptoms of disordered eating, in a sample of men and women from a college population. Disordered eating behaviors could range from eating rapidly to restricting food intake. The results of this study suggest that women are more likely to report a difference between their current and ideal weight. Furthermore, gender and weight dissonance seemed to have a significant relationship with disordered eating behaviors. This study adds to the literature by showing that there is a deferential relationship between the way that women and men, see their current weight vs. their ideal cognitive weight, and the correlation to disordered eating behavior.

145. HUNGER AT THE HOUSEHOLD LEVEL: A BASELINE STUDY OF FOOD SECURITY IN MADRIZ PROVINCE, NICARAGUA

Presenter(s): Cisneros, Yomer
Authors: Cisneros, Yomer; Millares, Carla; Boren, Amy

Nicaragua is the second poorest country in Latin America (IFAD, 2012). Currently, 20% of Nicaragua’s population is undernourished, and 22% of children are unable to reach their expected height due to stunting (UNDP, 2014). Previous research suggests that Nicaragua, in recent years, has promoted a model of comprehensive care for rural and urban production, actions that have reduced the level of chronic malnutrition. The main objective of this research is to create a baseline for food security in 13 communities of the Madriz province in North-Central Nicaragua. UNICEF (2004) has classified Madriz province as having both high and very high vulnerability to food insecurity. This study aims to identify issues relating to food security and to suggest measures to overcome identified constraints in order to improve the food security situation in the region. Surveys collecting data on household food security status, including dietary habits and food consumption, income, and food preparation customs will be analyzed through SPSS to characterize the situation for each community. This baseline will be very for understanding food security in the region and designing future food security interventions for this area.
146. LATINA/O COLLEGE STUDENT ALCOHOL USE AND ACADEMIC PERFORMANCE: CULTURAL COPING RESILIENCY AGAINST DISCRIMINATION

**Presenter(s):** Cox, Kassidy  
**Authors:** Cox, Kassidy; Piña-Watson, Dr. Brandy

**Background:** Latina/os are the largest ethnic minority in the U.S. and report more discrimination than non-Latina/o Whites. Discrimination can produce negative outcomes such as alcohol use and low academic performance. Studies have shown that Latina/o college students struggle with alcohol use and lag behind other ethnic groups in terms of college graduation rates. Purpose: Given the high alcohol use by Latina/o college students and academic achievement gaps, the present study seeks to determine the relationship between discrimination, alcohol use, and academic performance. Specifically, we hypothesized that all forms of discrimination (i.e., job, academic, public, healthcare, and general) would predict higher levels of alcohol use and lower academic performance. We also investigate the protective value of religious and family coping. We hypothesize that higher levels of family and religious coping would be protective in the relationship between discrimination, alcohol use, and academic performance.  

**Methods:** Participants were 165 Latina/os who attend college in a large university in Texas. Responses were recorded using Qualtrics. Results: Higher public discrimination directly predicts higher alcohol use severity and lower academic performance. Higher levels of religious coping moderated the relationship between healthcare discrimination and alcohol use severity. Additionally, higher levels of family coping moderated the relationship between public discrimination and grade point average. Conclusion: This study provides information about how religious and family coping can be used to protect against various forms of discrimination experienced by Latina/o college students. This can be particularly helpful in developing interventions with those who report high levels of discrimination.

147. ETHNIC IDENTITY AS A CATALYST FOR MEXICAN DESCENT ADOLESCENTS’ MENTAL HEALTH AND ACADEMICS

**Presenter(s):** Cruz, Lauren  
**Authors:** Cruz, Lauren; Piña-Watson, Brandy; Lopez, Belém, Martinez, Ashley

Latinas/os are the largest minority group in the U.S. and continue to lag behind other groups in academic outcomes. Specifically, it is estimated only 76.8% of Latinas/os complete high school and 10.6% obtain a college degree. This is troublesome given the fact that Latinas/os make up 17% of the U.S. population, of which Mexican descent individuals are the largest ethnic group (U.S. Census, 2013; CDC, 2012). Given the educational gap present, understanding mechanisms that can be targeted for efforts aimed at increasing academic success for Mexican descent individuals is imperative. Given this, the present study tested a multiple mediation model, which accounted for the relationship between ethnic identity affirmation, mental health (depression and life satisfaction), and academic outcomes. Specifically, it was hypothesized that the mental health variables will mediate the relationship between ethnic identity affirmation and academic outcomes (i.e., academic motivation, academic skepticism, and ambition for higher education). Additionally, it was hypothesized that academic motivation and skepticism would mediate the relationship between mental health and ambition for higher education. The study included 525 Mexican American adolescents who attended high school in South Texas. Self-report measures were used. The hypothesized path model achieved acceptable model fit. Additionally, all hypotheses were supported. This study provided understanding of mechanisms through which ethnic identity affirmation was related to ambition for higher education. This model showed that feeling good about ones ethnic group membership is a strength and should be attended to in counseling and school settings as a target of intervention and prevention efforts.
148. CULTURAL DIFFERENCES AND LINGUISTIC CORRELATES OF PERSONALITY AMONG ARABS AND AMERICANS: A NOVEL ANALYSIS OF CULTURAL FRAME SWITCHING

**Presenter(s):** Dabbakeh, Nadeem  
**Authors:** Dabbakeh, Nadeem; Ireland, Molly

Big Five personality surveys and computerized text analysis of self-descriptive Arabic and English writing assessed personality differences between Arab and American samples. Americans reported higher openness and conscientiousness, and Arabs reported higher neuroticism, driven primarily by greater vulnerability to stress. Although extraversion did not differ between cultures, facet-level analyses revealed that Arabs reported more gregariousness. Arabs showed greater sex differences in personality than Americans, with sex significantly moderating agreeableness, hostility, and gregariousness in Arabs. For example, Arab men reported slightly greater hostility than American men, whereas Arabic women showed the opposite pattern. Contrary to conservative media reporting, cultural differences for hostility were insignificant for both sexes. Bilingual Arab-Americans respond differently to some Big Five items written in Arabic or English, for example mirroring the differences in agreeableness. In other categories like Extraversion, significant differences between monolinguals were not mirrored in bilinguals when switching languages, suggesting that Big Five items may not all translate proportionally to each other from English to Arabic. Word counts in self-descriptive writing differed dramatically between monolinguals and bilinguals when speaking the same language, suggesting the pragmatics of language differ between monolingual and bilingual speakers.

149. MECHANISMS OF HOW GENDER-SPECIFIC COMMUNICATION BEHAVIORS ELICIT VERBAL RESPONSES IN NEWLYWED SPOUSES’ COURTSHIP NARRATIVES

**Presenter(s):** Ginste, Kristen; Parrales, Orlando  
**Authors:** Ginste, Kristen; Parrales, Orlando; Oldham, Rebecca, Yuan, Shu; Ireland, Molly

Investigations of whether interviewer gender affects participant responses have largely focused on content areas, such as gender-related attitudes or sensitive behaviors (Davis et al., 2010). Less studied is how, in semi-structured interviews, communication styles of male and female interviewers influence responses. We studied the interplay of interviewers' and participants' linguistic patterns from 159 interviews of primarily Hispanic newlyweds recalling courtship experiences. Markers of interview content and depth were, respectively, past-tense verb usage and frequency of negative-emotion words (Morton, 1978). Because of the courtship-interviews' retrospective nature, participants' past-tense verb usage was taken to represent relevant dialogue. Emotional self-disclosures, particularly negative ones (Tolstedt & Stoke, 1984), reflect greater disclosure depth (Reis & Shaver, 1988). We expected that female interviewers would elicit more interview content and depth than male interviewers, because the former would ask more questions, be more sympathetic and cheerful, use more emotion words, and use more agreeable responsive cues (Colvin & Longueuil, 2001). Results confirmed expected gender differences in interview strategies and participant content and depth. Moreover, the number of questions interviewers asked acted as a full and partial mediator between interviewer gender and interview content and depth, respectively. Controlling for participant sex and race, courtship length, and commitment volatility, interviewers' emotion-word usage partially mediated between interviewer gender and interview depth (at borderline significance). These findings add to the interviewer-gender literature by suggesting female interviewers may elicit more depth by asking more questions and using more affect during interviews. These results may aid future interviewer training.
150. PARAGRAPH IV CERTIFICATIONS AND PATENT CHALLENGES: AN EXPLORATION OF COMPETITION BETWEEN BRAND AND GENERIC DRUG FIRMS

**Presenter(s):** Gonzalez, Aaron  
**Authors:** Gonzalez, Aaron

Since the implementation of the Hatch-Waxman Act and its accompanying Paragraph IV clause, various studies have examined its impact on brand drug effective market life, start-up and alliance formations, patenting behavior, and brand drug firm share value. While an absolute assessment of its impact is somewhat inconclusive and requires consideration of exogenous variables, the paramount trends are an increase in patent challenges and generic entry. Our study is comprised of an updated list of brand name, novel molecular entity (NME), prescription drugs, which have received a Paragraph IV certification between 2004 and 2014 and were FDA-approved after the Hatch-Waxman Act. In accordance with preceding studies, a time series analysis was conducted on various characteristics of brand drugs: market life, patent life, drug delivery form, priority status, and patent count. Our econometric analysis extends previous work in this area by introducing parameters for measuring successful generic entry. These parameters include the number Paragraph IV certified drugs versus the number of drugs with FDA-approved generic competitors, the time period between Paragraph IV certification and actual generic entry, and the success rate in nullifying the litigated patent(s).

151. MEASURING CHANGES IN EMPATHY IN TTU HONORS COLLEGE STUDENTS: HOW THE CLIMATE OF FYE IS A CATALYST FOR CHANGE

**Presenter(s):** Kopanski, Stephanie  
**Authors:** Kopanski, Stephanie; Hawley, Patricia; Phillips, Rachael

The FYE program 2015 implemented a Pilot Program in four of the classes meant to introduce students to topics of cultural importance (Race, Sexual Assault, Gender/Sexual Orientation, and Microaggressions). This educational program gives students the opportunity to alleviate issues of denial and negative experiences when discussing these topics. Thus, our current research will evaluate the effectiveness of this intervention by measuring changes in empathy, comparing Pilot to Non-pilot classes. In addition, we will measure students’ perceptions of the environment of the Honors College in terms of their relative self-efficacy, anticipated GPA, belonging, general well-being, and their conformity to masculine/feminine norms in order to garner an overall picture of the Honors College student ecology. It is our prediction with these additional measures that students of the Pilot Program will have higher ratings of self-efficacy and belonging due to the depth and length the Pilot topics were discussed between students and Honors faculty. We intend to measure conformity to masculine/feminine norms to better predict how students will react to the environment of the Honors College as a whole. We predict that students will rate the Honors College as a relatively feminine environment; however, we predict that the population of students in the Honors College will rate themselves more masculine. The researchers will provide a survey link to FYE Professors who will email the link to their students. The survey will query students about their perceptions of the Honors College and their own self-evaluation based on the investigated measures.

152. ENGAGEMENT ON DANIEL TIGER’S NEIGHBORHOOD INVOLVING KIDS WITH AUTISM

**Presenter(s):** Lund, Amanda  
**Authors:** Dotson, Wesley; Lund, Amanda

Children on the Autism Spectrum struggle socially. One popular intervention that has been developed to overcome social issues is video modeling. Many parents of children who are on the Autism Spectrum have noted the increase in social skills after watching the popular PBS cartoon Daniel Tiger’s Neighborhood. The objective of this experiment is to determine what behavior’s a child engaged in while watching the program and to determine whether those behaviors predicted rates of the children learning the targeted skill. To test this we observed two five year old children with ASD watch Daniel Tiger’s neighborhood. Four social skills were measured using a partial interval system
including off task or challenging behavior, orientation, and engagement. Behaviors were scored every 15 seconds for the duration of the episode.

153. FACTORS INFLUENCING PHYSICAL HEALTH AND WELL-BEING

**Presenter(s): Mangold, Ani**

**Authors: Mangold, Ani**

This experiment tests whether maintaining a wide expansive pose, or "power pose" before exposure to scenarios designed to increase feelings of nausea or anxiety lessens their effects. Participants either watched a YouTube video to induce motion sickness or were told that a fictitious illness with commonly experienced symptoms, Hyposceni-B, was spreading across campus in order to increase their feelings of anxiety. Half of the participants were asked to hold a power pose for one minute, while the other half were not. Results were measured by comparing pre and post nausea and anxiety questionnaires across conditions with sex as a mediator. Regression analyses (with log-transformed outcomes) showed a general trend toward lower levels of nausea, but did not reach levels of statistical significance. Further analyses showed an interaction between sex and sopite subscale scores, with women in the power posing condition showing reduced symptoms. Men, however, did not differ in reported symptoms. Similar interactions were also observed in peripheral and central subscales. For participants in the anxiety condition, regression analyses (with log-transformed outcomes) showed a general trend toward higher levels of positive affect in the experimental condition compared to the control condition, but not at levels of statistical significance. Although previous research has focused on how enacted behaviors affect observers, this experiment investigates the effect of power posing on one’s physical and mental health. The experiment’s findings demonstrate a causal relation between behavioral activation and a decrease in sopite symptoms amongst females, and therefore can be adopted by women undergoing chemotherapy.

154. WHAT DOES THE GRAFFITI IN POMPEII SAY ABOUT ITS CULTURE?

**Presenter(s): Medina, Julissa**

**Authors: Medina, Julissa**

Graffiti can be viewed as an outlet of self-expression, a way of sharing ideas and thoughts with the world. Analyzing graffiti can take us into the mind of the creator and most importantly give us insight into its surrounding culture. The purpose of this study is to explore the culture of Pompeii through its wall art. More specifically focusing on the question how does graffiti represent its culture and what does it say about its people? This study will analyze the root of graffiti, how graffiti was used in this era, and the type of people who engaged in it.

155. THE ROLE OF THE VENTROMEDIAL PREFRONTAL CORTEX IN CATEGORY LEARNING: DECISION EVIDENCE OR EXPECTED REWARD?

**Presenter(s): Morris, Kimberly**

**Authors: Morris, Kimberly; Worthy, Darrell; Byrne, Kailegh, Brashears, Bailey; Davis, Tyler**

Ventromedial prefrontal cortex (VMPFC), has been found to track subjective value estimates in a number of behavioral economic and reward learning tasks. However, VMPFC also tends to track cognitive processes not clearly identified with expected value such as episodic memory formation, metamemory judgments, and measures of decision evidence in basic decision making tasks. Together, these results suggest that the VMPFC may have a more general role in cognition such as signaling confidence rather than computing subjective value per se. To test this hypothesis, we conducted an fMRI study in which expected value of responses was anticorrelated with the decision evidence associated with making a choice. Subjects learned to categorize perceptual stimuli that differed along two perceptual dimensions using trial and error. In this task, items located closer to the boundary, separating the categories, tend to be the hardest to classify and items far from the boundary the easiest. To pit expected value against decision evidence, we thus rewarded items more the closer they were to the boundary. Subject specific predictions for expected value, probability
correct, and prediction error were estimated from behavior using reinforcement learning models and were used to interrogate the fMRI data. We found that VMPFC only tracked probability correct, our measure of decision evidence. No voxels in VMPFC were correlated with expected value at even liberal thresholds. These results suggest that in category learning, VMPFC may not code subjective value per se, but a more general function related to decision evidence.

156. THE VAS VS. LIKERT SCALE: WHICH IS MORE INTUITIVE?

**Presenter(s):** Nettles, Haleigh; Curtis, Jacob  
**Authors:** Nettles, Haleigh; Curtis, Jacob

The Visual Analogue (VAS) and the Likert Scale are response scales used to measure subjective characteristics or attitudes. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating a position along a continuous line between two end points. The Likert Scale is usually a five to seven point scale which allows a respondent to express how much they agree or disagree with a statement. Each of the five or seven response points is assigned a numerical value to measure the attitude. This study examined the intuitiveness of the Likert Scale and the Visual Analogue Scale (VAS) based on the time it takes to complete each. The Depression Anxiety Stress Scales was deployed through Qualtrics. The survey was divided into the Likert and VAS format. The Likert took significantly less time to complete than the VAS, t (196) = 2.25, p = .0258.

157. THE RELATIONSHIP BETWEEN MARRIAGE, SELF-CONTROL AND HAPPINESS

**Presenter(s):** Nunez, Miguel  
**Authors:** Nunez, Miguel; Alquist, Ph.D., Jessica

Married people report greater happiness than unmarried people, especially individuals in high quality marriages (e.g., Diener et al., 1999; Heady, Veenhove & Wearing, 1991; Myers, 1999, 2000). Self-control is the ability to restrain one’s thoughts and behavior. Previous research has found that the aggregate amount of spouses’ self-control predicts relationship satisfaction (Vohs, Finkenauer & Baumeister, 2011). We hypothesize that the relationship between marriage and happiness will be stronger for participants with high self-control than participants with low self-control. Participants will be recruited from Amazon’s Mechanical Turk and complete online measures of marital status and happiness. These findings may provide evidence that individuals with low self-control may not enjoy the same benefits from marriage as individuals with high self-control.

158. PERCEIVED CONFLICT RESOLUTION AS A MECHANISM EXPLAINING THE LINK BETWEEN SPOUSES’ FINANCIAL STRAIN AND THEIR SATISFACTION IN MARRIAGE

**Presenter(s):** Parrales, Orlando; Ginste, Kristen  
**Authors:** Yuan, Shu; Oldham, Rebecca; Ginste, Kristen, Niehuis, Sylvia

It is well known that financial strain negatively predicts spouses’ marital satisfaction. Unknown are the mechanisms involved. We examined whether one’s perception of their partner’s ability to effectively resolve conflicts might be one such mechanism. Therefore, we predicted that financial strain would affect couples’ conflict resolution (mediator), which, in turn, would predict marital satisfaction. To test this hypothesis, data from 92 newlywed Hispanic and Caucasian couples, recruited primarily via marriage license records from the Lubbock County courthouse, were analyzed. Given spouses’ interdependent data, husbands’ and wives’ analyses were run separately. Regression results replicated prior research with regard to the association between financial strain and satisfaction, and also fully supported our hypothesis for husbands, and partially the one for wives. Specifically, perceiving that one’s partner is able to effectively resolve conflicts fully mediated the association between financial strain and satisfaction in husbands. That is, for husbands, the significant association between financial strain and satisfaction disappeared entirely when men perceived their spouse to have good conflict resolution skills. For wives, the magnitude of the relationship between financial strain and their own satisfaction was merely reduced when wives’ perception of husbands’ conflict resolution ability was taken into account. These findings suggest
that men might profit more than women from a partner with good conflict resolution skills. These findings have important implications for couple therapy, because they point to the importance of trying to alter spouses’ perceptions of one another’s conflict resolution ability and of helping spouses attain better conflict resolution skills.

159. EXAMINING DYADIC AND SOLITARY SEXUAL DESIRE AND PFC ACTIVATION IN RESPONSE TO SEXUAL STIMULI USING FNIR

Presenter(s) Pennie, Tramel
Authors: Pennie, Tramel; Bradsha, Spencer; Zielinski, Mazie, Wilhite, Hannah; Burden, Ryan

Previous research using fMRI has examined how sexual desire as a unidimensional construct, associates with Prefrontal Cortex activation responses to sexual stimuli. Research has not yet examined PFC activity in response to sexual stimuli using functional-near infrared technology, nor has there been enough focus on how dyadic vs. solitary desire associate with PFC activation responses. This study attempts to examine 1) fNIR as a viable alternative to fMRI in research on sexual desire and the Prefrontal Cortex, and 2) whether or not type of desire (dyadic vs. solitary) associates with distinct regions in the PFC. Using fNIR imaging, PFC activation during presentation of sexual stimuli was measured in a sample of recovering alcoholics. Participants reported their dyadic and solitary sexual desire through completion of the Sexual Desire Inventory (SDI). While data has been collected, but not yet analyzed, it is anticipated that fNIR will prove to be a valuable and cost-effective tool for examining the relationship between sexual desire and PFC activation. We also anticipate that solitary and dyadic desire will associate with distinct regions/activation patterns in the PFC in response to sexual stimuli. This research may increase understanding of sexual desire and PFC processing of sexual stimuli, ultimately leading to benefits for those with sexual dysfunctions (such as HSDD and ISD).

160. THE EFFECTS OF EGO DEPLETION ON MEDIA PROCESSING AND ENGAGEMENT

Presenter(s): Sirgo, Matthew
Authors: Sirgo, Matthew; King, Andy

This continuing project studies the effects of ego depletion (lower levels of self control) on how people process and engage with popular media. Specifically, the project will test if people with lower levels of self control process and engage with audiovisual messages (i.e., TV programs) differently than those with higher levels of self control. Self control (ego depletion) will occur for individuals in the study (or not) before participants watch a sequence of videos. After watching each video, participants are responding to questions about how much they enjoyed the video, if they felt immersed in the video, and if they perceived the video as realistic. Research and theory suggests that people's enjoyment and engagement of these videos will depend on their level of ego depletion, with the effects of ego depletion on enjoyment/engagement explained by people's perceptions of believability, engagement, and immersion in the narratives.

161. MEXICAN DESENT ADOLESCENT SUICIDALITY, DEPRESSION, HOPLESNESS, & LIFE SATISFACTION: THE ROLE OF GENDER AND CAREGIVER CONNECTION

Presenter(s) Yanez, Estephania
Authors: Yanez, Estephania; Pina-Watson, Brandy

U.S. Latina/o youth have significant mental health disparities with outcomes such as suicidality, depression, and other indicators of well-being when compared to youth from other ethnic backgrounds. Latina girls are at a higher risk than Latino boys. Given the Latina/o value of familismo, which places emphasis on family interconnectedness, levels of caregiver-child connection may shed light on these elevated rates. For the present study, we will investigate the relationship of caregiver-child connectedness with suicidality (ideation, plans, and attempts), depression, hopelessness, and life satisfaction for Mexican descent adolescents. Specifically we hypothesize that lower levels of caregiver-child connection and being a girl will be related to worse outcomes. Self-report data was
collected with a sample of 524 Mexican descent adolescents (53.1% female; 46.9% male) from the U.S. Texas/Mexico border. A series of linear and logistic regressions were conducted. Results indicated that higher connection with the female caregiver was related to a lower probability of reporting suicidal ideation, plans and attempts. In terms of the other mental health outcomes, higher levels of both male and female caregiver connection were related to lower levels of depressive symptoms, hopelessness, and higher levels of life satisfaction. Additionally, females reported significantly higher levels of depressive symptoms, suicidal ideation, plans and attempts than boys. It is concluded that male and female caregiver connectedness and gender are differentially associated with various mental health outcomes. This study has the potential to inform family interventions aimed at improving mental health outcomes and could serve to decrease disparities for Mexican decent adolescents.
162. MOVING INSIDE - A REVOLUTIONARY STEP IN THEATRICAL LIGHTING DESIGN

**Presenter(s):** Ballard, Maura S.

**Authors:** Ballard, Maura S.

My research will focus on the lighting strategies and techniques used during the English Renaissance period, an era best known for William Shakespeare's innovative plays and his most famous venue of performance, the Globe Theatre. However, there were many more theaters that housed Shakespearean plays during that time. Initially, these playhouses were only outdoor playhouses, but eventually indoor playhouses became popular. By critically evaluating the lighting techniques of both outdoor and indoor playhouse settings, I will demonstrate that the change from outdoor to indoor playhouses became the first and most crucial step in the development of more complex lighting techniques that we find in later periods. After a short historical overview on the various forms of public performances in place during the early Renaissance (inn yards, outdoor and indoor playhouses), I will discuss current research in the area of Shakespearean lighting techniques, focusing in particular on printed as well as electronic publications by Robert B. Graves, C.J. Sisson, and William Johnson. Even though current research on lighting techniques in English Renaissance Theatre suggests that the difference in lighting techniques between the two settings of the playhouses was minimal, I will argue that there is clear evidence that the construction of the indoor playhouses allowed the next generation of theatrical lighting designers to not only improve their techniques but to enhance the aesthetic usage of theatrical lighting as well.

163. PABLO PICASSO AND HENRI MATISSE: MODERNISM, RIVALRY, AND FRIENDSHIP

**Presenter(s):** Bellet, Caitlin

**Authors:** Bellet, Caitlin

How did the competitive friendship and ongoing rivalry between Pablo Picasso and Henri Matisse influence each artist’s work as well as influence the rise of Modernism in the early 20th century? Pablo Picasso and Henri Matisse are icons to this very day; therefore showing that art is still important. However, many people are unaware that these two artists spent their careers in a never-ending game of trying to outdo one another. With this rivalry, both Picasso and Matisse had the ability to create new styles of art, as well as explore other outlets for art during the Modernist period. I will be researching the influence that their rivalry had on each artist, and how it is/was important to the Modernist movement. By explaining why Picasso and Matisse did the things they did, I hope to show how their friendship and rivalry was critical in each artists’ development into icons. I will also be examining the works and methods that both artists used in relation to one another.

164. SPACE AND PLACE AND THE APPLICATION OF GEOGRAPHIC PRINCIPLES TO ART HISTORY

**Presenter(s):** Joiner, Madeline

**Authors:** Joiner, Madeline

The objective of this research project was to assist Dr. Janis Elliott in creating an interactive GIS map of the medieval Kingdom of Naples, representing the works of art and architecture commissioned by the Angevin royal family and aristocracy in the 13th and 14th centuries. This will provide a comparative geographic setting and help illuminate the role of space and place in the construction of meaning of monumental architecture. The focus of my paper is to investigate the application of cultural spatial approaches to the study of medieval art, from the big picture of viewing entire kingdoms in context, to the way space and place is represented in the two-dimensional arts. Studying spatial placement and representation in medieval art and architecture can allow a deeper understanding of a given object or monument within its physical and geographic context. Inversely, understanding the "space" of a "place," helps us to understand peoples’ interaction within it, and thus their creation of meaning within it through ritual communal activities. I will show that the interdisciplinary incorporation of spatial or geographic principles to the study of art history, as yet in its early stages, shows promise of being a fruitful route of enquiry for art historians.
165. HIGH & LOW PEANUTS: THE POPULARIST ART OF TOM EVERHART

**Presenter(s):** Jones, Sarah  
**Authors:** Jones, Sarah

Tom Everhart, (b. 1952) an American artist famous for painting canvases of Snoopy in psychedelic, translucent colors, introduces Charles Schulz’s Peanuts to fine art museums. Everhart met and began working for Schulz in 1980. Hospitalized in 1988 with cancer, Everhart began experimenting with the Peanuts characters in a new light. In 1991, Schulz granted Everhart legal permission to use subject matter from Peanuts in his own artwork. Everhart is the only artist allowed to do so. As many modern and contemporary artists, such as Everhart, innovate pre-existing “Low” imagery (like the comic strip) to the levels of “High” art (painting), the categories of High and Low Art are becoming obsolete. Contemporary art historian, Kirk Varnedoe, recognizes this categorization problem. My purpose is to situate Tom Everhart within a new category known as Populism (illuminated by art historian Julian Stallabrass) and to analyze five of Everhart’s paintings with recent concepts introduced by contemporary art historians. Despite some critics viewing Everhart’s paintings as “low”, I argue Everhart should be considered as a cutting-edge Popularist artist who extends Warhol’s revolution by appealing to mass culture trends. High and Low Art are defined, Popularist art history is evaluated, and the relationship between Everhart and Schulz is recognized. By examining Everhart’s Popularist Art through the lenses of categories applied to the assessment of contemporary art, my paper brings new perspective to consider Everhart and other artists like him whose works are in the liminal space between art museums, private art collector's homes, and the Internet.

166. AN ARCHITECTURAL PROCESS IDEOLOGY

**Presenter(s):** Spencer, Lawson  
**Authors:** Spencer, Lawson

Answering the question, "What is architecture?" has been a debated subject matter since the beginning of architecture. In 15 BC, Marcus Vitruvius Pollio delivered the most famous definition of architecture in his book De Architectura (Ten Books on Architecture). Vitruvius began by explaining that architecture exists in three separate but equal parts: utilitas (commodity), firmitas (firmness), and venustas (delight), which must all be present for a piece to be deemed architecture. Though Vitruvius' definition was befitting, it has become less relevant as new architectures develop with time. This research intends to challenge the definition of architecture in terms of Vitruvius by synthesizing contemporary definitions of today. Through the lens of the contrasting definitions presented, this paper will derive one central construct. Rather than allowing the historical understanding of architecture to stand alone, such a synthesis aims to bring agency to the primary and fundamental processes through which architecture has and should evolve. It is through this particular evolution in tandem with an emphatic definition that the purpose of architecture will be exposed, lending insight to who and what deems architecture as architecture. For if one cannot define architecture, how can one determine its purpose? Much less go through a process of design?

167. HONEY, AIN’T YOU GLAD WE’RE TEXAN: THE MYTHIC NARRATIVE OF TEXAS IN THE TEXAS CENTENNIAL

**Presenter(s):** Wilson, Hannah  
**Authors:** Wilson, Hannah

The Texas Centennial Exposition in 1936, held in Dallas, was the first exposition of its kind in the state. Texas celebrated its 100th anniversary of independence from Mexico with a permanent Fair Grounds and 176 day celebration. Focused on Texas history, the Centennial would be so large and important it would attract the attention of the rest of the nation. Texas history could then be utilized for advertisement, and also to communicate a Texas historical narrative. Expanding on current scholarship, I examine the Texas Centennial and one of its focal points, the State of Texas Building. With the new scholarship on Texas identity and myth making, such as the new publication of Lone
Star Pasts, I argue alongside Cummings that the Texas Centennial poses a significant shift in Texas identity. However, rather than the argument that Cummings proposes, crafting an idea of a Western Texas, I propose that the Centennial was used to encapsulate and perpetuate the Texas myth and identity. I have found that reusing the phrase 'glorious past', as well as describing the Hall of State as an active historical shrine, the newspaper articles at the time give solid evidence that the response to the Hall of State was a success, just as the building planners had intended, which encompassed the new myth making shift in Texas.
168. MIGRATION IN CO-CULTURE IS LINKED TO PATHOLOGICAL ACTIVATION OF VALVULAR INTERSTITIAL CELLS

**Presenter(s): Dinh, Mai**

**Authors: Dinh, Mai**

Heart valve diseases constitute a significant cardiovascular problem, with thousands of hospitalizations and associated deaths annually. Heart valves help control the blood flow in the heart by opening and closing hundreds of thousands of times a day. Due to such extreme mechanical conditions, heart valve cells need to have the ability to sense pathology-initiating environments. These molecular mechanisms triggered by valvular cells - endothelial (VEC) and interstitial (VIC) - are largely unknown. In this study, we apply a new instrument for the study of cell migration, which enables testing of cellular transformation based on signals in co-culture. In this device, two neighboring chambers of VIC and VEC are isolated, until a separation barrier is removed, allowing cells to migrate and exchange chemical signals. We observed that at 7 days, VIC migrate into the VEC side of the culture chamber and at 10 days, both VIC and VEC have redistributed throughout the neighboring chambers. In addition, VIC phenotype transformation (to pathologic phenotypes) is enhanced in the co-culture environment. These results show that VIC-VEC communication is necessary for cells to transform to their activated states abundant during pathological conditions. This study is the first to employ a platform that allows not only for exchange of small molecules, but for microscopic visualization of cell migration on a soft surface, after an isolated period of growth. Future studies will focus on employing different co-culture ratios and analyzing VEC phenotype.

169. HIDDEN DANGERS OF HYDRAULIC FRACTURE DRILLING: INCREASED LEUKEMIA RATES IN NORTH TEXAS

**Presenter(s): Lanza, Jessica**

**Authors: Lanza, Jessica**

What is the spatial distribution of leukemia clusters in North Texas and their relation to fracture drilling? Fracture drilling has increased exponentially across North Texas. Millions of gallons of water containing nearly 600 chemicals are pressure injected into the earth. Only 15-40% of the fluid is actually recovered. The rest of the fluid is left in the earth with the possibility of contaminating underground aquifers. Many of the drilling sites are located within neighborhoods. These areas have shown a drastic increase in leukemia cases since the presence of fracture drilling. A chemical present in the fluid is the carcinogen benzene. In this study I will graph lymphoma cases and drilling pads to show the increase in cases around pads. I will then obtain tap and well water samples from households between one and five miles from a pad to test for benzene. Well casing failures allow chemicals used in "fracking" fluid contaminate underground freshwater, which in turn contaminate the bodies of those drinking the chemicals.

170. EVALUATION OF CROSS-SPECIES PROTECTIVE EFFICACY OF SM-P80 VACCINE AGAINST SCHISTOSOMA JAPONICUM INFECTION IN MICE

**Presenter(s): May, Jordan**

**Authors: May, Jordan; Molehin, Adebayo; Zhang, Weidong, Rojo, Juan; Siddiqui, Afzal**

Schistosomiasis remains a major global health problem. Despite large-scale schistosomiasis control efforts, clear limitations such as re-infection rates and the emergence of drug resistant parasites, necessitate the development of an effective schistosomiasis vaccine. Schistosoma mansoni antigen Sm-p80, a protein involved in the mechanism of schistosome membrane renewal, has been implicated in the mechanism of host immune modulation and/or evasion by schistosomes. Several vaccination studies by our group have consistently shown that Sm-p80 vaccine provides high protection levels against S. mansoni as well as cross-species protection against urogenital schistosomiasis caused by S. haematobium. We therefore hypothesize that induction of specific host immune responses through Sm-p80-based vaccination would also provide an opportunity to control
Asiatic schistosomiasis caused by S. japonicum. Sm-p80 vaccine was generated by cloning full-length coding sequence of Sm-p80 gene and the recombinant protein expressed in Escherichia coli followed by affinity chromatography. Two groups of mice were immunized with either the adjuvant only (Control group) or Sm-p80 vaccine (Vaccinated group) and subsequently infected with S. japonicum cercariae. Sm-p80-specific antibody titers will be measured by ELISA with vaccine efficacy being determined by reduction in worm burden and tissue egg load. Statistical significance differences between the two groups calculated via t-tests with P values less than 0.5 considered statistically significant. We expect to observe a balanced pro-inflammatory and Th2 type response after vaccination with a corresponding reduction in adult parasite worm and tissue egg burden. Sm-p80 vaccine is currently being prepared for GMP-compliant manufacture and further pre-clinical development leading to human clinical trials.

171. CELLULOSE NANOCRYS TALS: THE NEXT BIG THING

Presenter(s): Moussa, Sami

Authors: Moussa, Sami; Yang, Hu; Abidi, Noureddine

Cellulose is the most abundant of all naturally occurring compounds and, therefore, a biological goldmine for biotechnological research and application. As it is found in all plants, cellulose is biodegradable and nearly limitless in supply; making it applicable in modern manufacturing methodology will be as invaluable as it would be cheap. Cotton is one of the most abundant cellulose resources and it contains a high cellulose content (~95%). Cellulose nanocrystals (CNCs) are cellulosic products of low molecular weight that are produced by means of acid hydrolysis of cellulose. CNCs are rod-like shaped fibers in a nanometer scale with various interesting properties in mechanics, physics and chemistry. CNCs are able to self-assemble to form a hierarchical arrangement exhibiting a chiral nematic liquid crystal phenomenon. In this study, we sought to explore the variation of liquid crystal behavior of CNCs when they were subjected to direct current and alternating current fields. This behavioral tendency could contribute to current liquid crystal technology which may have potential to develop next-generation photosensitive items and promote future liquid crystal display (LCD) technology.

172. EFFECTS RED GRAPE POMACE AS ALTERNATIVE ROUGHAGE SOURCE IN THE ADAPTATION PERIOD OF FEEDLOT FINISHING STEERS.

Presenter(s): Pellarin, Lucas

Authors: Pellarin, Lucas; Sarturi, Jhones; Campanili, Pedro, Ovinge, Lauren; Smith, Zachary

Cattle adaptation phase, from pasture to feedlot finishing diets, represents approximately 40% of the overall roughage consumed after arrival in the feedlot. Roughage ingredients are bulky, require gridding, extra labor and facilities, elevated shrinking losses, and may attract cattle to the bunk, due to the low palatability combined with physical aspect of the particles. Red grape pomace, a winery byproduct, comes as a potential more sustainable alternative source of roughage in feedlot adaptation diets, because of its fiber content (40%). The effects of red grape pomace as roughage source in the adaptation period on cattle growth performance, carcass characteristics, nutrient digestibility, and intake behavior were evaluated. Forty-eight crossbred yearling steers were blocked by weight and assorted to 24 pens (2 steers/pen) into 2 adaptation strategies: traditional strategy (alfalfa hay and cotton seed hulls-based diet); and red grape pomace strategy. Steers were fed once daily a series of five diets consisted by four 7-d step-up diets and a one common finishing diet (150-d). Dietary steam-flaked corn increased for both strategies as they approached the finishing diet. Animals were weighted every 28-d period and amount fed daily adjusted for refusals. Carcass characteristics will be collected at commercial packing-plant. Intake behavior (24-h evaluation period) was performed in each step-up and finishing diet. Total tract apparent digestibility was measured using acid insoluble ash (diet internal marker) to estimate nutrient fecal output. Positive or neutral effects of red grape pomace on cattle parameters evaluated might grant this winery byproduct a strategic place into the cattle industry.
173. IS THE DIFFERENTIAL COUPLING OF GQ TO V2R MUTANTS DUE TO CLONAL SELECTION, OR AN INTRINSIC PROPERTY OF THE MUTATION?

Presenter(s) Smith, Jake

Authors: Smith, Jake; Janovick, Jody

Vasopressin type 2 receptor (V2R) is a G-protein coupled receptor that helps regulate water reabsorption in the kidneys. Wild-type (WT) V2R is capable of activating pathways that result in IP and cAMP production. However, a mutation (L83Q) exists that results in ER retention and failure of the mutant to be expressed on the plasma membrane. L83Q can be rescued with the pharmacopereone drug Satavaptan (SR); however the rescued mutant is no longer able to produce IP when stimulated with vasopressin. The objective of this experiment is to investigate whether loss of IP production an intrinsic characteristic of the mutant, or due to clonal selection. We will use several different cell lines of two types: stably expressing WT V2R or stably expressing L83Q V2R. In addition, WT V2R will be transiently transfected into a stable cell line expressing L83Q to show that the Gq/11 system is still intact. Prior research has shown that certain mutants of V2R exhibit decreased IP production when stimulated by vasopressin as compared to WT V2R. We predict that L83Q causes a conformational change that prevents the binding of Gq and transduction along the pathway. We will use the following methods: transient transfection with DNA, radioimmunoassay of cAMP, measuring IP production by Gq/11, sterile techniques, and cell culture techniques.

174. THE EFFECT OF SPECIES ECOLOGY ON SPATIAL BIAS

Presenter(s) Smith, Rebecca

Authors: Smith, Rebecca; Fisher-Phelps, Marina; Kingston, Tigga

It is necessary to account for spatial bias when producing species distribution models so the maps accurately represent the true distribution. Spatial bias occurs when data do not represent the actual distribution of a species but instead are clustered due to sampling effort or methodology; resulting in a negative effect on the model. We will compare differences in spatial bias between bat ensembles to assess the cause and extent of bias. We hypothesize that species ecology affects the magnitude of spatial bias present in bat localities because researchers are biased towards certain environments, which may not represent the true range of a species with high spatial or temporal variability. We will compare spatial bias by comparing global and local Moran’s I statistics with a Monto Carlo bootstrap procedure. Analysis has not yet been completed but we predict that cave-dependent bat locality records will be more spatially biased, specifically more clustered in space, than forest-dependent bats because cave bats exhibit greater variability over their range. Researchers may thus be less likely to sample them effectively. The importance of looking at species differences in spatial bias is because the method of bias correction may be species dependent. Therefore researchers may choose to correct data differently when accounting for spatial bias.
BRAND CONCEPT MAPPING AS A METRIC FOR BRAND EQUITY

Presenter(s): White, Bailey
Authors: White, Bailey

David Aaker’s 1991 book Managing Brand Equity introduced brand equity as a concept crucial to understanding consumers’ responses to a company. In Managing Brand Equity, Aaker addressed a question plaguing marketers: What is brand equity? Brand equity is "a set of assets...linked to the brand and add (or subtract) value to a product or service" (Aaker 1991, p. 4). The advent of brand equity as a marketing tool heightened focus on customer relationships and brand image. This consumer-based focus presents as many problems as it does solutions. Chiefly, how does a company use brand equity to develop a brand personality that is memorable and appealing to consumers? Brand personality is defined as "the set of human characteristics associated with a brand" (Aaker 1991, p. 347). A metric for measuring brand equity is necessary to answer this, but noticeably absent. This paper explores how brand equity can be measured using brand concept mapping. Data were derived directly from the source of brand equity: consumers. In order to measure participants' responses to certain brands, I administered free association tests, a comparative Likert scale, and brand concept maps. Brand equity is easily investigated with qualitative methods. However, the results of this paper indicate that brand equity may be approached from a quantitative perspective as well. Data derived from brand concept maps may be used for a variety of purposes. For instance, brand concepts may be used for research and by companies seeking to understand how brand image changes in response to a campaign.
176. A FORGOTTEN BEGINNING: THE PRESERVATION OF THE CHILDHOOD OF CLYDE BARROW AND BONNIE PARKER

**Presenter(s): Campbell, Robert**

**Authors:** Campbell, Robert

The preservation of Clyde Barrow’s childhood home, at 1221 Singleton Blvd, Oak Cliff, Dallas, Texas and the elementary school Bonnie Parker attended, at 1601 Chalk Hill Rd., Dallas, Texas, would highlight an era that is often misunderstood, allowing the American public an education beyond the glamorous lifestyle that is portrayed when discussing the outlaws. In a time where almost nothing relatable to the couple exists, besides small artifacts strewn over Texas, Louisiana, even into Nevada where their "death car" now rests, this is the perfect opportunity and means to educate the public of the desperation of the Great Depression and emphasize that crime does not pay. There are historical sites relevant to the couple, but physical buildings are scarce. One building in Joplin, Missouri, having ties to the couple, was the location of a shootout and is now preserved and listed on the National Register of Historic Places. These sites bring history to life for those who don’t fully understand history. These structures are valuable pieces of evidence of the destitution of the Great Depression. They provide a beginning to the Bonnie and Clyde saga because of the couple’s childhood attachment to the sites, an invaluable perspective when examining the beginnings of one of the largest crime waves, moreover, one of the most notorious couples in American history. The historical site relating to the finale of Bonnie and Clyde is already preserved and attracts countless enthusiasts every year, therefore, the beginning must be as well.

177. STIGMA STIGMATA: THE FINE LINE BETWEEN SPIRITUALITY AND MENTAL ILLNESS IN ANA CASTILLO’S THE GUARDIANS

**Presenter(s): Chavarria, Mariah**

**Authors:** Chavarria, Mariah

Mental disorders and illnesses are already very complicated and tricky, but Ana Castillo furthers the complexity of Schizophrenia by throwing in racial identity into question when considering psychological ailments. It is no surprise that society has created a stigma for mental illness, especially in the Mexican American culture which Ana Castillo displays within her novel The Guardians through her young and devoted character Gabriel (Gabo). I apply a psychological lens to the reading of Ana Castillo’s The Guardians. Castillo uses Gabo’s complete devotion to his religion as a way for Mexican Americans to relate to his tumultuous upbringing. By showing outsiders a glimpse into the complicated lives of this culture, Castillo provides understanding to those not a part of this culture that Mexican Americans battle with mental illnesses and how these disorders come about. The belief that specific individuals can hear God’s voice and the message He has for them to deliver or carry out, just like in Wally Lamb’s autobiography, is where my argument comes into play: where do you draw the line between spirituality and mental illness? As part of my research into this subject, I will create a psychiatric plan to help combat Gabo’s Schizophrenia. By taking apart the ideals and beliefs that many uphold for those considered God’s direct servants, and psychologically analyzing them, I hope to change the stigmas created within this particular society that are placed on mental illness.

178. AGRICULTURAL COMMUNICATIONS SKILLS, ABILITIES AND KNOWLEDGE DESIRED BY EMPLOYERS COMPARED TO CURRENT CURRICULUM: A LITERARY REVIEW

**Presenter(s): Corder, Jessica**

**Authors:** Corder, Jessica; Irlbeck, Erica

The agricultural communications program has been around for the last 97 years. The 41 programs found across the nation strive to prepare students for success in the classroom and the workplace after graduation. Research was examined from four universities. These universities were chosen because of the top four ag comm programs with a graduate program. The other ag comm programs
in the nation ranked these programs as the top four. Curriculum from these universities was also examined for the skills currently being taught. The purpose of this study was to evaluate the skills, abilities and knowledge employers and industry professionals look for in ag comm graduates. The next step of the study was to examine the current skills, abilities and knowledge being taught by faculty members in the ag comm programs across the nation. This literary review examined 17 articles and found the most popular skills and abilities desired by graduates were written communication skills, character skills, visual communication skills, and oral communication skills. The skills found in the curriculum currently being taught were written communication skills, visual communication skills, oral communication skills, and very few character skills. For college programs to improve upon curriculum and prepare students better for the future, faculty and staff should improve upon teaching character skills to the students.

179. THE CONCEPT AND FUNCTION OF ALTERNATE REALITIES WITHIN CHILDREN’S LITERATURE FOR FEMALE READERS

Presenter(s): Ferguson, Lauren
Authors: Ferguson, Lauren

Beginning with the conception of children’s literature in the Victorian age and expanding into the present, children’s novels frequently utilize the idea of the alternate reality in order to engage young readers. My research explores the purpose and functionality of these mystical realms for young female readers. Many of these works contain prominent female characters, all of whom must navigate their own fantastical worlds in order to find their own meaning and purpose. My work theorizes that diverse and fierce women characters, accompanied by fantastic representations of reality, give young girls to ability to navigate their own world. In order to prove my claims, I compare two key periods of children’s literature: the mid 19th to the early 20th century and time period from the late 1990’s to the present. Works included in these periods, which range from the Wizard of Oz to Harry Potter, consistently feature significant female protagonists. These characters are vibrant and resourceful representations of womanhood living in fantastic worlds, giving young female readers the draw of exotic domains with a practical role model attached. Furthermore, these novels give young women a safe space, specifically an alternate reality, to explore womanhood as well as their own potential through other admirable women. The paper concludes that other worlds presented in many children’s novels often function to empower young women by allowing them to negotiate womanhood through an engaging world and accompanied by fantastic female role models.

180. ESSAYS ON ARTIST VOLUNTEER PROGRAMMING WITH WOMEN AND CHILDREN

Presenter(s): Hash, Elizabeth
Authors: Hash, Elizabeth

A division has recently formed between art therapists (those who are formally trained and licensed in health care, art, and therapy) and artist volunteers (those who are not formally trained in health care or therapy, and focus on solely on artmaking). This division has handicapped the potential that art therapists and artist volunteers have to revolutionize art in health care, if they would only work together. To make matters worse, there are very few programs worldwide that provide any form of training for artist volunteers, much less that provide training in conjunction with art therapists. By qualitative, observational analysis and interview, this compilation of essays supports the potential benefits that artist volunteers have to offer health care, and how programs that train such volunteers to work in conjunction with art therapists can increase this potential. This research focuses specifically on artist volunteer programs that work with ill women and child long-term patients at a hospital in Texas, as well as with Burmese women and child war refugees in a war relief program in Thailand.
181. SUPERHEROES AND POSTTRAUMATIC STRESS DISORDER: UNMASKING THE POWER OF NARRATIVES

Presenter(s): Hoyer, Amanda
Authors: Hoyer, Amanda

Posttraumatic stress disorder (PTSD) has a convoluted history, where even legitimizing it took decades. Even now it is a controversial diagnostic topic which mental health professionals are still attempting to define and treat. One of the more popular treatment methods for PTSD is cognitive behavioral therapy (CBT). CBT aims to reshape patients’ thought patterns and behavior: One form of CBT is narrative exposure therapy (NET). Using NET, therapists adapt narrative structures into the treatment of PTSD. A popular narrative format is graphic novels. In particular, superheroes’ coincidental development with major social trends reflects the experiences, ideologies, and cognitions of the greater part of society. With superheroes’ prevalence on the rise, this presentation enumerates the clinical benefits of using these modern myths in therapy. By highlighting case studies on prominent characters like Captain America, the Punisher, Iron Man, Batman, Batgirl, and Ms. Marvel, the relationship between PTSD and pop-culture reveals itself.

182. ASSESSING THE FOOD ENVIRONMENT OF THE EAST LUBBOCK COMMUNITY

Presenter(s) Jun, Julie
Authors: Jun, Julie; Chin, Charity; Hoover, Linda, Park, Oak-Hee

The East Lubbock community is a low-income and ethnic minority community that might have a greater difficulty meeting dietary guidelines established by the U.S.D.A., setting them at greater risk for health problems. The objective of this study was to investigate the East Lubbock community food environment by examining the availability, accessibility and affordability of food outlets. A list of all food outlets (n=1,524) provided by the City of Lubbock was classified into seven categories including supercenter, supermarket, grocery, convenience, specialty, full-service restaurants, and fast foods on the basis of North American Industry Classification System’s definition. Geographic Information System (GIS) was used to map all food outlets in Lubbock and to analyze spatial relationships. In the East Lubbock area, 3 population-weighted centroids were mapped from which accessibility and availability to food outlets were measured (i.e. by distance, driving time, walking time, and public transportation). After GIS mapping, stores were individually investigated using a modified NEMS-Stores survey to examine the availability, quality, and price of food items within each outlet. The GIS maps revealed the East Lubbock residents required traveling farther to access supercenters, supermarkets, and grocery stores than did other Lubbock residents. Also, there was a lack of accessible public transportation within the area that contributed to fewer accessible food locations. Outcomes of NEMS-S survey verified supercenters, supermarkets, and grocery stores carried more variety of healthier options as compared to convenience stores. This indicates that East Lubbock residents have lower chances to purchase healthy food items within the area.

183. RESEARCHING RADICALS: MY YEAR WITH THE WOMEN OF THE KU KLUX KLAN

Presenter(s): Lewis, Dylan
Authors: Lewis, Dylan

My presentation will explain my archival work process, the difficulties and triumphs, and also illuminates how several difficulties in archival research can be a source of research and inquiry. My experiences with this kind of research have occurred over the past year while I worked with Dr. Abigail Selzer King on her book about the Women of the Ku Klux Klan (WKKK), an organization from the 1920s that had extensive ties to political and social structures around the United States. Though much of this data was already collected by Dr. Selzer King, my job was to index, abstract, and organize over 600 documents by and about the Klanswomen. While researching the group through nearly 200 public newspaper articles, I was reliant on having access to articles from major 1920s newspapers, having access to digitized copies or microfilm, and that these articles had text
recognition or appropriate tagging. Because this group was a secret society, much of what was reported in the newspapers was incorrect, incomplete, or contradictory. Furthermore, since the WKKK was a radical women’s organization, there was often a large amount of gender bias that affected the reporting of this group. For example, while "Klansmen," "Klanspeople," and "Klanswomen" were the common terms for referring to members of the KKK and WKKK, a reporter for The Washington Post ignored that established system, referring to Klanswomen as "Lady Klansmen." Interestingly, while this inconsistency provides a difficulty in the research process, it is also a source of the research being conducted.

184. "PLEASE LOOK AFTER THIS BEAR": THE MYTHS AND REALITIES OF BRITAIN’S CHILD EVACUATIONS 1939-1945

**Presenter(s):** Muncy, Sarah  
**Authors:** Muncy, Sarah

Released in 1958, Paddington Bear and his experiences were drawn from author Michael Bond’s memories of child evacuees during the London Blitz. Paddington Bear provides an example of the mythology surrounding the concept of a World War Two child evacuee, the foundation of which was laid in 1939 with the first evacuation scheme. Radio programmes and posters not only encouraged the British public to support the evacuation schemes, but also exemplified the idea that taking in an evacuated child or releasing your own children to be evacuated to the British countryside or further was patriotic duty. The propaganda surrounding the schemes likened evacuation service to military service and portrayed it as important in maintaining the quintessential "stiff upper lip." However, the mythology involved is in many cases, truly myth. This paper will explore the myriad realities of evacuation on an individual basis and demonstrates how, for many children, both those who enjoyed their evacuation experience and those who suffered, the systems put into place overlooked the emotional consequences of abandonment and return. We do not know what would happened to Paddington Bear had he returned to live in Darkest Peru, but without a doubt, after years of eating bread and marmalade, drinking English breakfast tea, and enjoying the traditions of British every day life, such a return to the Peruvian jungles would not have been an uncomplicated, un-nuanced homecoming.

185. THE MEDIA’S PERSPECTIVE AND INFLUENCE ON HUMAN TRAFFICKING

**Presenter(s):** Sullivan, Christopher  
**Authors:** Sullivan, Christopher

Due to its complex and serious nature, human trafficking is an interdisciplinary issue that can be addressed from both a media and journalistic perspective. Human trafficking is an issue that many journalists and human rights activists find difficult to address in their work. As a whole the media is a powerful tool for informing the public about human rights abuses. Using Repko (2012) ten steps of the interdisciplinary research process (IRP) the ethical and human rights issues the media, news reporters, and victims face are examined. Qualitative, quantitative, and content analysis examined how human rights activist use mass media techniques of films, campaigns, and public service announcements to advocate against and inform the public of human rights abuses. Finally, the impact of the hostile media phenomenon is examined to understand how it effects advocacy behavior, public opinion shifts, and public reaction to specific issues and influences gathered from the media. The importance the press, and activists, have in connecting with audiences to raise awareness of the human trafficking issue, and to help victims find both a voice and refuge is highlighted.
186. THE RELATIONSHIP BETWEEN NASA AND PRIVATE SPACE COMPANIES: A GAME THEORETICAL STUDY

Presenter(s): Berry, Jason

Authors: Berry, Jason

The United States has led the world in space exploration for decades, but lately budgetary concerns may have begun to hobble space exploration. The following paper looks at trends in United States funding levels for the National Aeronautics and Space Agency (NASA). Specifically how this impacts the agencies distribution of contracts and funds. The question I aim to answer is whether current practices of contracting with private space companies (PSC) is the optimal use of NASA resources, as opposed to internal development and research. Utilizing historical records, and analyzing leading literature, I have created a game theoretical model to illustrate the strategies for NASA and PSC. My conclusions indicate that current legislative conditions, coupled with a track record of less than optimal NASA funding, make the Nash Equilibrium for NASA to continue contracting with PSC.

187. POSTTRAUMATIC STRESS DISORDER: THE ENDLESS WAR IN THE LIFE OF NORTH VIETNAMESE VETERANS

Presenter(s): Ha, Chi

Authors: Ha, Chi

Even though there are many studies of Posttraumatic Stress Disorder (PTSD) among American soldiers after the Vietnam War, research on psychological casualty among North Vietnamese Army (NVA) soldiers is rarely mentioned. This study examines how NVA soldiers have been coping with psychological injury in their subsequent life to the Vietnam War. This project uses oral history as the research methodology. Analysis is based on narrations of several NVA veterans to assess the indication of PTSD in their postwar life. By conducting interviews with North Vietnamese veterans in Vietnam, the research project explores the risk factors of PTSD such as exposure to death, starvation, physical wounds inflicted during the war and the bitter re-entry into society. By doing this, the research will clarify how the attitude towards war veterans in current society might improve healing or worsen the psychological wounds. This study discovers that the North Vietnamese veterans had become forgotten revolutionary heroes, who are still fighting an endless psychological war out of the ignorance of current society. Since many former NVA combatants are suffering from the war trauma without awareness from the society, this research project hopes to give a better understanding of the effects of wars on the NVA veterans in order to improve their life as well as the life of their family members. This survey contributes a new perspective to the understanding of the consequences that the Vietnam War induced on North Vietnamese veterans.

188. A FAMILY LABOR APPROACH TO HUMAN TRAFFICKING

Presenter(s): Hernandez, Santiago

Authors: Hernandez, Santiago

Despite international efforts to eradicate child labor and human trafficking in all its forms, the problem still persists within many nations of sub-Saharan Africa. Using Repko’s (2012) 10 Steps for interdisciplinary research, which includes an extensive literature review, this paper examines the complex relationship between natural resources and human trafficking within the resource extraction (mining) industry. It argues that the origins of human trafficking cases begin with the structure of the family unit and the distribution of labor outside of the home. Furthermore, it finds that not only do current legal frameworks fail to take these factors in to account, the very definitions of human trafficking and child labor on which the frameworks were founded, have contributed to the inability of these laws to comprehensively address this complex problem. This paper suggests that a family labor based approach to human trafficking can potentially address the issues surrounding the use of child labor, and human trafficking as a whole, within the mining industry of sub-Saharan Africa.
189. FEAR AND THE GREAT WAR

Presenter(s): Kindermann, Tyler
Authors: Kindermann, Tyler

This thesis will analyze the experiences, memories, and beliefs of those involved in the Great War and their relation to the emotion of fear. Through their introduction to a particularly violent and technological war, soldiers, prisoners of war, and civilians under occupation each experienced a different perspective on the war and by extension each experienced different situations and scenes of fear. This paper seeks to answer the question about that fear, how did it affect the minds, bodies, and reactions of all those involved, what factors increased or decreased fears effectiveness, and how did societal viewpoints differ from the individuals experiences? Fear itself wreaked havoc on the likeness of man since his beginning. The soldiers, POWs, and civilians of WW1 in Europe were of no exception. In the words of the great French philosopher and author Michael De Montaigne, "The thing in the world I am most afraid of is fear." Through this project I will journey into the mind of those involved in the Great War, seeking to discover how and when fear struck its victim, how these reactions correlate to their relation to 'the Front.' In the words of Dr. Dollard in his work 'Fear in Battle', "Fear is a strong drive, and it is learned. Fear is a normal response to danger. In some situations and degrees it is useful; in others, dangerous."
190. A BAYESIAN STATISTICAL ANALYSIS OF THE GOP PRESIDENTIAL NOMINATION FOR 2016 ELECTION

Presenter(s): Alexander, Brittany
Authors: Alexander, Brittany; Ellingson, Leif

Using a combination of polling data and previous electoral results, Nate Silver successfully predicted the electoral college distribution in the presidential election in 2008 with 98% accuracy and in 2012 with 100% accuracy. His success was attributed largely to his focus on Bayesian statistical modeling. The application of a multifaceted model on predicting the nominee of a major political party has been rarely studied. The nomination process consists of multiple election dates, which allows the early states to influence the outcome of the future states. This experiment will include predictions of all the primary elections and the possible outcomes of the presidential election in November.

191. A MICROFLUIDIC RECTIFIER ENABLING ZERO BACKFLOW IN THE PULSATILE FLOW REGIME

Presenter(s): Coltisor, Vladimir
Authors: Coltisor, Vladimir; Jang, Lee-Woon; Kim, Jungkyu

Many microfluidic pumps use pulsatile flow to deliver discrete volumes to specific target locations. Backflow within pulsatile microfluidic pumps can have an adverse effect on droplet generation and causes unwanted mixing due to breakdown in laminar flow boundaries. A fluidic diode would provide a rectifying effect and restrict backflow allowing for a much more precise flow pattern. Fluidic rectifying structures have been proposed in the past however, many of them work at high Reynolds numbers. Microfluidic rectifiers tend to be for continuous flow and pulsatile flow diodes tend to be mostly lifting gate structures and flap structures. None of these structures eliminate backflow completely. We developed a fluidic rectifier comprised of active and passive components that not only remove all backflow but also allows for control over dispersed volume. This microfluidic rectifier was then tested under various pulsatile flow conditions which were generated by the three microfluidic valves. Different pressures which were used to optimize flow patterns and characterization. Outflow profiles from the microfluidic rectifier were then compared with the output profiles which were obtained from the microfluidic channel without the rectifier structure. Flow data that was collected from both was compared after normalization. This zero backflow platform can also be used for a portable droplet generator which would simplify the complexity of current droplet platforms.

192. MEASURING THE BEAM CURRENT OF A VAN DE GRAAFF ELECTRON ACCELERATOR

Presenter(s): Hayes IV, Thomas; Brown, Zachary
Authors: Brown, Zachary; Hayes IV, Thomas

TTU’s Van de Graaff Generator accelerates electrons to energies as high as 2.5 MeV with as much as 250 microamp beam current. As the accelerator extraction beamline undergoes upgrades, we plan to improve the beam diagnostic systems. Our objective is to simulate, design and build a modern non-obtrusive way to monitor beam current for the accelerator. The electrons inside the beam pipe are not bound to a metal like the current in a wire and therefore it must be measured indirectly. We plan to build an electrically isolated pick-up tube inside of the beam pipe to measure the image current with less than 1% error over the entire operating range of the accelerator. The precise beam current information is crucial for all future research projects conducted using the accelerator.
193. DISASTER RELIEF RECOVERY

**Presenter(s):** Hooper, Renee  
**Authors:** Hooper, Renee

The central research objective is to find a way to anticipate or calculate a trend in the disaster relief process of people and neighborhoods. The main focus of the research is to explore the key drivers of post-disaster relocation and place attachment. To do so a case study was considered in which residents of Moore, OK were surveyed on their post disaster experience in the aftermath of 2013 tornado. The data collection was designed to be performed in three waves and is currently in the starting phase of the third wave. This past semester, I had to learn about the research in order to fully understand what we were doing. I read over about eight scholarly essays and analyzed them in order to write my own summary on my review of literature. My other main involvement in the research was to assist with entering survey data into a pre-designed database. Each questionnaire was comprised of almost 100 questions targeting residents’ internal attributes such as their demographic and socioeconomic data together with their personal views on the influencing parameters on housing recovery decisions. We are anticipating spending a few more weeks on data collection and entry after which data analysis and modeling will start.

194. CHEMICALLY PATTERNED PAPER-BASED MICROFLUIDIC DEVICE FOR BIOASSAY

**Presenter(s):** Lam, Trinh  
**Authors:** Lam, Trinh; Kim, Jungkyu

Paper-based microfluidics has been a promising technology that offers a number of useful capabilities: the ability to minimize consumption of samples and reagents for various bioassays, cost effective fabrication, and relatively rapid analysis. However, current fabrication methods creating fluidic networks still require a complex fabrication technique, expensive equipment, and thermal sensitive property. In this presentation, a simple procedure to create fluidic networks using chemical vapor deposition (CVD) is introduced. To create a hydrophilic fluidic pattern, a part of chromatographic paper was masked by using patterned vinyl tape, and TCS was then vaporized onto the masked chromatographic paper. The vinyl tape was then removed to fabricate a paper-based microfluidic device with desired shaped channels. With the optimized CVD conditions, we demonstrated both immunoassay and glucose assay on the patterned chromatographic paper. With the increase of the glucose concentration, the color of each channel on the paper got darker. The images of the assayed papers were obtained and analyzed RGB intensity of each well to determine their glucose concentration. The paper microfluidic device was achieved 10μg/mL limit of detection on the glucose assay which is equivalent LOD with commercially available system. Similar results were obtained from IgG detection on the paper microfluidic device. The paper-based microfluidic device offers a simple, rapid, and cost-effective sensing platform which provides a relevant limit of detection. Generally, this paper-based microfluidic technique could be applied to other biomarkers such as cardiac panel, cytokines, and liver panels, which require much higher sensitivity.

195. EXPANDING POSIX FOR GRAPHMETA METADATA MANAGEMENT SYSTEM FOR HIGH PERFORMANCE COMPUTING

**Presenter(s):** Muirhead, Nicholas  
**Authors:** Muirhead, Nicholas; Chen, Yong

GraphMeta is a rich metadata management system for high performance computing systems based on a property graph abstraction and model of metadata. GraphMeta is optimized for high scalability enabling it to keep up with the explosive expansion of data creation being experienced today. Currently GraphMeta has limited interoperability to work with POSIX interface and semantics (e.g. a tree-based directory structure) due to the graph-based architecture. In this research, we look into utilizing FUSE for the purpose of enabling POSIX interface and semantics to be able to fully utilize GraphMeta capabilities and significantly increase the interoperability of GraphMeta. For this purpose,
we have conducted an initial research and development of supporting POSIX functions such as open, read, ls, mkdir. There is also a need for us to expand POSIX so that it can handle the multidirectional traversals of graphs that GraphMeta utilizes. This research broadens the impact and use cases of the GraphMeta for high performance computing systems. With the rapid expansion of data creation that is being experienced today there has been a push in the technology industry for new and better ways to store all of this new data. This is especially true in regards to high performance computing (HPC) which are capable of generating vast amount of metadata about varying entities including files, users and jobs. One of the solutions that has been garnering attention from many experts in data storage has been to insert all of the created metadata into a graph-based structure. Where the vertices of the graph store the entities such as filename, permissions, file size, last time accessed and edges of the graph contains the relationship between two vertices. Within the computer science department at Texas Tech University along with the help of members of the Mathematics and Computer Science Division at Argonne National Laboratory have designed their own graph-based metadata management system for high performance computers called GraphMeta. GraphMeta is a highly scalable system due to optimizations that utilize a combination of advance vertex and edge cutting algorithms, along with a custom graph traversal engine called GraphTrek. GraphTrek uses asynchronous graph traversal enabling it to avoid bottlenecks cause by vertices with an abnormally high amount of edges. GraphTrek stores a traversal-affiliate cache in order to avoid multiple revisits so the same vertex. Through GraphMeta a user is able to perform stringent data auditing with the detailed user-to-file access history stored allowing for very in depth security checks of a system. Portable Operating System Interface (POSIX) are standards specified by the IEEE Computer Society. These specifications were made in order to define an application programming interface (API), command shells, and utilities that could be used throughout a variety of Unix and Unix-based operating systems allowing for effortless transition from one to another. POSIX standards include some of the most well know terminal functions used including ls to list directories, mkdir to create a new directory, and cd use to change the present working directory. POSIX uses a tree-based directory structure meaning that to traverse the tree one is required to go to the top of the tree each time before you can make your way to the desired directory, this can make traversal very slow in large structures. In our research we set out to integrate the POSIX standards into GraphMeta allowing for GraphMeta to be utilized by a much larger audience. We set out with two implementation strategies in mind. The first of which was to use a wrapper library which would allow for straightforward implementation. This option would require that post implementation a remote procedure call framework also be implemented. The other strategy was to implement using the application Filesystem in Userspace or FUSE. FUSE allows non-privileged users to create their own file system in user space. We opted to go with FUSE as it required fewer changes down the road. Through FUSE we were able to create a new file system where we were able to redefine how the POSIX functions worked so that they would create and traverse a graph properly. This allows for a HPC that is POSIX compatible to use GraphMeta with POSIX commands. Our ongoing work includes the inclusion of more POSIX functions along with running benchmarks through applications such as mdtest and evaluating the outcomes. After that there are plans to implement POSIX security mechanisms for graph-based metadata management systems.

196. UNDERSTANDING THE ALGORITHMIC EVOLUTION: A CASE STUDY AND ANALYSIS OF EVOLUTIONARY ALGORITHMS USING LINE FOLLOWER ROBOTS

**Presenter(s):** Watkins, Scott; Johnson, Carlton

**Authors:** Bakirci, Cagri; Watkins, Scott; Johnson, Carlton, Aksak, Burak

An Evolutionary Algorithm (EA) is a metaheuristic search and optimization method, used when analytical solutions are not feasible. In EA, the effectiveness and the speed of a given algorithm are highly dependent on parameter selection/tuning. The lack of a generalized theory that can guide researchers to choose the algorithm parameters a priori has been an ongoing issue in the field. In this study, in an attempt to assess the feasibility of such a generalized guideline, a systematic study is performed where the effect of various parameters in the EA is analyzed and treated according to the principals of evolutionary biology. These parameters are fitness function, population size, population
type, natural selection, sexual selection, mutations, and crossover rate. This interdisciplinary analysis is accomplished using a Line Follower Robot (LFR) and a reconfigurable track. The robotic platform with a single-layer neural network was also simulated in MATLAB and was utilized for initial experiments. A custom test platform (BIOMS-EA) in MATLAB and a wireless communication and control toolbox using Arduino and Java were developed for simulation and data collection. Using both systems, the impact of critical parameters affecting the behavior of algorithmic evolution are analyzed. Results show that fundamental analogies can be found between EA and evolutionary biology, which might yield a unified theory for parameter selection and tuning in the field. This is one of the few studies that is designed to systematically collect data to analyze parameter selection in EA in an attempt to formulate a unified Theory of Algorithmic Evolution.
197. MARINE DEBRIS: PROBLEMS, POLICIES, AND POSSIBILITIES

**Presenter(s): Hogan, Ashley**

**Authors: Hogan, Ashley**

Marine debris is a major anthropogenic problem throughout the world. Marine debris impacts global environments, human welfare, and economies. The transnational nature of marine debris, coupled with deficient waste management systems by nations throughout the world, provides challenges that current policies attempt to address. This paper provides an overview of marine debris policy at local, territorial, and international levels. Then, I introduce a behavioral choice model that conceptualizes how individuals make suboptimal decisions given certain constraints. I conclude with a case study using existing data from South Caicos, Turks and Caicos Islands (TCI), to discuss why the problem persists and consider what policy objectives represent real alternatives for addressing marine debris.

198. HEALTH CARES EFFECTS ON HUMAN TRAFFICKING

**Presenter(s): Montano, Joshua**

**Authors: Montano, Joshua**

Human Trafficking in the recent years has seen an increase in victims and offenders. Applying Repko’s 10 steps and using an interdisciplinary literature review process can address this complex problem. Using health care administration and finance as two perspectives to view human trafficking, the question is asked, “How can health care administration take steps to ease the rate of human trafficking?” Health care administrators and financial advisers both use their training and financial theories to understand what is needed to achieve their goals of reducing human trafficking. In the final analysis, research has shown that the increase of human trafficking, can be successfully met by the health care system through an increase of training and more financial backing.

199. AFFECTIVE RESPONSES TO THE CONFEDERATE FLAG IN WEST TEXAS

**Presenter(s): Richardson, Dalton**

**Authors: Richardson, Dalton**

This research analyzes connections between feelings toward the Confederate flag and college year. Multivariable linear regression is utilized to calculate the strength of correlation between demographic characteristics, the region in which respondents report that they grew up, the belief the flag is representative of southern heritage and pride, and the presence of the flag in one’s culture or environment. Regression reveals that political affiliation and the belief the flag does not represent heritage and pride are the biggest indicators of response to the Confederate flag, with gender and region being somewhat significant. Despite college year not being significant via regression, analysis of qualitative data reveals that respondents in their junior years and above were more likely to utilize negative emotional language when describing the flag. Future areas of research are offered.

200. CELEBRITY CULTURE, ROMANCE, AND YOUNG ADULTS

**Presenter(s): Rickman, Elle**

**Authors: Rickman, Elle**

There is a large gap in the research on celebrity culture with regards to the influence it may be having on young adult romantic relationships, therefore the goal of this study was to shed much needed light on whether the two could be related. Due to the nature of this study, no causal effects are assumed. Students (N=480) from a large public university in West Texas were surveyed on their admiration of celebrities, and whether or not they believed celebrity culture was influencing their romantic relationships. The results from this sample showed that individuals who admired celebrity couples were more likely than the general sample to indicate that celebrity culture was influencing their romantic relationships. Some gender differences were also found amongst this particular sample. Females were more likely than males to indicate celebrity admiration with the exception of seeking similar qualities in a romantic partner that their favorite celebrities possess.
201. TOWARD THE USE OF THE BHATTACHARYYA DISTANCE IN ANALYSIS OF AFFECT CONTROL THEORY DATA

Presenter(s): Scott, David
Authors: Scott, David

We examine the potential of a possible new tool in EPA analysis, the Bhattacharyya distance, and its advantages in comparing cultural datasets that do not match across all concepts. To test this, controlled pairs of closely-matched culture datasets are compared through the Euclidean distance method and an implementation of a Bhattacharyya method with the accuracy of each recorded. Following that, we analyze some potential uses for the described Bhattacharyya method by testing the Japan 1998-2002 EPA data for gender disconnects.

202. RURAL MENTAL HEALTH NEEDS IN WEST TEXAS

Presenter(s): Stovall, Hollie; Turner, Emily
Authors: Verette, Megan; Campos, Mandy; Teoh, Vivian, Lim, Alex; Dennis, Cassie

The purpose of this study was to attempt to identify mental health needs in rural West Texas communities. We created an online survey through Survey Monkey that was sent to people in various professions living in rural communities that would most likely encounter people struggling with mental health concerns. These professions included law enforcement, pastors, school counselors, school administrators, teachers, physicians, nurses, professional counselors (e.g., licensed professional counselors or psychologists), and social workers. We asked these professions to identify the primary mental health needs in their respective rural communities, and how often they encounter people with mental health needs. We asked what their typical response would be when they encountered mental health concerns, and whether or not they had any mental health training. We also asked about mental health services in their respective rural communities, assuming there were any. Finally, we inquired as to whether or not their rural communities would be interested in telemental health services, such as online videoconferencing (counseling), if this service was available.

203. CYBER VICTIMIZATION

Presenter(s): Trevino, Alexandra
Authors: Trevino, Alexandra; Maloney, Patricia

Cyber Victimization is a phenomenon that has been growing at a tremendous rate in the past couple of decades. Here, we define cyber victimization as "the process of victimizing others through the use of information and communication technologies. Cyber-victims can be governments, organizations or individuals" (Roberts 2009: 57). There has been research done over the legal aspect of cyber victimization, what the different types are and who may be more at risk for cyber victimization. A sample size of 159 university students were surveyed and their responses were coded for themes of who they talked to, ways they knew about cyber victimization and what they thought was important for prevention. Five teachers and counselors were interviewed and their interviews were coded. Specifically, the research questions are what the relationship between cyber victimization policies and the effects it has on the victims. Overall, this study finds that adults in the school setting find it’s important for parent and school involvement in educating students about cyber victimization. Students go to friends more often with cyber victimization and the different ways that cyber victimization occurs and what they think is important for prevention.
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- 24/7 Staffing in the hall offices
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- Sleep later
- Limitless laundry rooms
- No bus hassles
- Card swipe access to all halls

Break away from the expected.
Travel. Serve. Learn.