April 15-17

2019

create

CREATE @ STATE

A Symposium of Research, Scholarship & Creativity

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Welcome to the ninth annual celebration of Create@State: A Symposium of Research, Scholarship & Creativity, showcasing the faculty-mentored works of our high achieving students from across all of the university's colleges and disciplines. This venue provides an opportunity for both undergraduate and graduate students to engage and present original work to stakeholders and the community in a professional conference setting. This symposium represents the annual culminating event of A-State's Create@State program which enhances opportunity throughout the year for student research and creativity and enriches co-curricular learning experiences in all disciplines. The works you will see this week are a testament to A-State's strong mentorship and inclusivity provided to our students by outstanding faculty research and creativity mentors. I hope you will participate in as many of the events over the three days as possible!

Best regards,

Thomas Risch, Ph.D.
Vice Provost for Research and Technology Transfer

April 15
2019

Schedule

9:00 a.m. - Noon
Fowler Center
Showcase of the Arts – *Music, Theater & Visual Arts*

9:00 a.m. - 9:45 a.m.
Creative Musical Performances, Riceland Hall

10:00 a.m. - 10:45 a.m.
Creative Visuals, Visual Arts & Theatre, Grand Ballroom

11:00 a.m. - Noon
Creative Theatrical Performances, Simpson Theatre

9:00 a.m. - 4:00 p.m.
Reng Student Union, 3rd Floor
Concurrent Oral Sessions
College of Liberal Arts and Communication
Including Humanities, Arts & Communication Studies

9:00 a.m. - 10:15 a.m.
College of Liberal Arts & Communication, Communication Studies, Arkansas River Room

10:45 a.m. - Noon
College of Liberal Arts & Communication, Communication Studies, Arkansas River Room

1:00 p.m. - 2:15 p.m.
College of Liberal Arts & Communication, Communication Studies, Arkansas River Room
College of Liberal Arts & Communication, Humanities & Arts, Black River Room
College of Liberal Arts & Communication, Humanities & Arts, White River Room

2:45 p.m. - 4:00 p.m.
Reng Student Union, 3rd Floor
College of Liberal Arts & Communication, Communication Studies, Arkansas River Room

Map (Third Floor, Reng Student Union)

ARKANSAS STATE UNIVERSITY

Room Used
Room Not Used

1) 1909 Suite
2) Alumni Lounge
3) Auditorium
4) Centennial Hall
5) Spring River Room
6) Cache River Room
7) Diamond Lounge
8) Green Room
9) Vaughn Student Lounge
10) Mockingbird Room
11) St. Francis River Room
12) Pine Tree Room
13) Multicultural Center
14) White River Room
15) Black River Room
16) Arkansas River Room

April 16 2019

Schedule

Reng Student Union, 3rd Floor

8:30 a.m. - 9:45 a.m.
Concurrent Oral Sessions
College of Nursing & Health Professions, Arkansas River Room
College of Education & Behavioral Science, Black River Room

10:00 a.m. - Noon
Poster Session
College of Nursing & Health Professions, Centennial Hall

10:15 a.m. - 11:30 a.m.
Concurrent Oral Sessions
College of Education & Behavioral Science, Psychology, Arkansas River Room
College of Education & Behavioral Science, Psychology, Black River Room

1:00 p.m. - 2:30 p.m.
Oral Session
College of Sciences & Mathematics, Arkansas River Room

2:30 p.m. - 4:30 p.m.
Poster Session
College of Sciences & Mathematics, Centennial Hall
College of Education & Behavioral Science, Centennial Hall

April 17 2019

Schedule

Reng Student Union, 3rd Floor

8:30 a.m. - 9:45 a.m.
Throw 'em to the Wolves, Business Pitch
Neil Griffin College of Business, Auditorium

10:00 a.m. - Noon
Poster Session
College of Agriculture, Centennial Hall
College of Engineering & Computer Science, Centennial Hall

10:15 a.m. - 11:30 a.m.
Throw 'em to the Wolves, Sales Pitch
Neil Griffin College of Business, Auditorium

1:00 p.m. - 2:30 p.m.
Concurrent Oral Sessions
College of Engineering & Computer Science, Black River Room
College of Agriculture, Arkansas River Room

2:45 p.m. - 3:45 p.m.
Demonstrations
College of Engineering & Computer Science, Vaughn Student Lounge

4:00 p.m. - 5:00 p.m.
Awards Program & Reception
Auditorium

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Create@State Symposium 2019 is finally here, and we would like to acknowledge the collaborative efforts of the administrators, faculty, staff and students across campus who have made this event possible. This event marks another record year of student presentations and performances, showcasing more than 100 oral and creative presentations and over 120 poster presentations, as well as engaging hands-on demonstrations by our students from various colleges and disciplines. This three-day event, both at Fowler Center and the Reng Student Union, is an inspiring showcase of the students' faculty-mentored research, scholarly and creative works from across each of our colleges and disciplines. This important event provides a diverse setting for students to engage with the community, showcase research for community impact, and to receive feedback from potential employers and networks for student learning and community building.

It is hard to believe that the Create@State Symposium started out as a research event nine years ago and has grown to not only showcase all disciplines and areas of study, but is now the culminating event of the Create@State student research and creativity development program, Create@State enhances opportunities through the year for students to engage in faculty-mentored research and creativity, focused professional development of vital critical thinking and communication skills, and enriches co-curricular learning experiences across all disciplines including engagement outside of the classroom and with the community. We are also excited to highlight an addition to the Create@State program, our very own weekly podcast, *Create@State: Making Connections that Count!* This podcast highlights faculty, students and community partners in discussing A-State's research and creativity that takes place at the university and with the community, its positive impact in both academic and community growth, and the learning experiences and advancements in the field these works provide in terms of impact and engagement. This podcast is a production through KASU Public Radio, as news director Johnathan Reaves provides the voice of Create@State in his weekly interviews that are released each Thursday through the podcast's notifications, and also airs as the second segment on A-State Connections, the weekly radio show highlighting how the university is connecting to people in the region, across the state and around the world. Join the more than 1,000 subscribers today and connect with the podcast on the NPR One app, Apple iTunes podcasts, and Google Play.

We sincerely thank and welcome this year's judges, made up of alumni, industry, community leaders and foundations who invest their time and resources in growing opportunities for student experiences reflected in the presentations in this week's showcase! Your engagement with our students and faculty make extraordinary experiences possible for our university.

As this event is a culmination of collaborative efforts across campus, we want to sincerely thank the Student Research and Philanthropy Councils, the Learning Commons, Assessment, Development, Career Services, Alumni Relations, Marketing and Communications, KASU Public Radio, and A-State's outstanding faculty mentors, chairs and deans of each of the colleges for working with our offices of Research & Technology Transfer and Advancement. Welcome, and enjoy this week's showcase of our students and the wonderful works here at A-State!

Sincerely,
Emily Devereux, Executive Director, Research & Technology Transfer
Jessica Blackburn, Director of Foundation & Corporate Engagement

** - Undergraduate ** - Graduate*

Showcase of the Arts - Music, Theater & Visual Arts, Fowler Center

April 15th, 2019, 9:00 a.m. - 9:45 a.m.

CREATIVE MUSICAL PERFORMANCES

RICELAND HALL

9:00 a.m.	**Parker Long***	Elemental Ambience
9:15 a.m.	**Adam Baxter***	Effective Coordination of Musical Elements in Persichetti's Parable for Solo Oboe
9:30 a.m.	**Jeremiah Page***	Accessing Harmonics on the Bass as an Extension of Register

April 15th, 10:00 a.m. - 10:45 a.m.

CREATIVE VISUALS, VISUAL ARTS & THEATRE

GRAND BALLROOM

Courtney Light*	Makeup for Animal Farm
Amy Faughn *	Makeup Design for Soft Animals
Zac Passmore*	Costume Design for Soft Animals
Davis Campbell* **Kassidy Ratz***	Constructing Turn of the Century Garments for Silent Sky
Abbey Cooper* **Hannah Martin*** **Claire Thomas*** **Courtney Light*** **Amy Faughn*** **Kennedy Woodall*** **Precious McCullough*** **Michaela Partridge*** **Katelyn Stanton*** **Lauren Wilcox***	The Eye-Nose-Mouth Connection: Creating Theatrical Animal Makeup Applications
Justin Mohler*	What Can Drawing Do For You?
Mallory Flippin*	Cat Print Prints
Mallory Flippin*	Cat Yawns
Autumn Harris* **Lexi Herring*** **Lourdes Hernandez***	App Development for Best Practices in Row Crop Burning
Kaly Beede*	Mental Self-Portrait
Kaly Beede*	Home
Cassandra Heck* **Christian Adams*** **Jacob Mathis*** **Laurel Gaither*** **Madison Riddle*** **Allyson Fowler*** **Sook Young Yoo*** **Grace Hill*** **Mathew Jones*** **Kenneth Wilette***	Selfie in Disguise (Value and Shape Collage): Design I Students *Individual Collages*

** - Undergraduate ** - Graduate*

April 15th, 11:00 a.m. - Noon

CREATIVE THEATRICAL PERFORMANCES

SIMPSON THEATRE

Abbey Cooper*	**Katelyn Stanton***	*Othello* by William Shakespeare
Carson Horton*	**Courtney Light***	*Henry IV Part 1* by William Shakespeare
Michaela Partidge*	**Hayley Scott***	*All's Well That Ends Well* by William Shakespeare
Bryce Moore* **Joshua Pryor***	**Whitley Fore Newman***	*Hamlet* by William Shakespeare
Theatrical and Dance Students		"*Walking in Space*" from HAIR, Musical Theatre Dance Performance

Theatre will continue with a performance of Godspell at 7:00 p.m., Tuesday, April 16, at Fowler Center.

Concurrent Oral Sessions, Reng Student Union, 3rd Floor

College of Liberal Arts & Communication
Including Humanities, Arts & Communication Studies

April 15th, 2019, 9:00 a.m. - 10:15 a.m.

COLLEGE OF LIBERAL ARTS & COMMUNICATION, COMMUNICATION STUDIES

ARKANSAS RIVER ROOM

9:00 a.m.	**Christian Willis***	Lesley Gore
9:15 a.m.	**Emily Crawley***	Queer Black Representation in Modern Television
9:30 a.m.	**Lashundra Clark***	The Transgender Ban in the Military
9:45 a.m.	**Zachary Young***	Your Gender is Being Conformed Even at the Latest Hours of the Night
10:00 a.m.	**Zoey Smith* '**	Pretty Hurts': How Societal Views Negatively Impact Women

April 15th, 2019, 10:45 a.m. - Noon

COLLEGE OF LIBERAL ARTS & COMMUNICATION, COMMUNICATION STUDIES

ARKANSAS RIVER ROOM

10:45 a.m.	**Benjamin Tucker***	The Power of Gender in Cosplay
11:00 a.m.	**Haley Peoples***	Halestorm: a Critical Analysis of Gender Performance in Today's Music Industry
11:15 a.m.	**Tanisha Tak***	Self-Disclosure in Peer Mentoring at the Communication Center at Arkansas State University
11:30 a.m.	**Steven Holmquist***	The Ultimate Issue, a Look at Gender in Coed Ultimate Frisbee
11:45 a.m.	**Tanisha Tak***	The Analyzation of the Representation of Gendered Topics in Brooklyn 99

** - Undergraduate ** - Graduate*

April 15th, 2019, 1:00 p.m. - 2:15 p.m.

COLLEGE OF LIBERAL ARTS & COMMUNICATION, COMMUNICATION STUDIES

ARKANSAS RIVER ROOM

1:00 p.m.	**Hyunwoo Ahn***	Male Dancer's Gender Role Identity Conflict and Adaptation
1:15 p.m.	**Katelyn Wall***	Sexual Assault: an Epidemic on College Campus
1:30 p.m.	**Emily Riley***	Women, Hunting, and Social Media: Defying Traditional Gender Norms
1:45 p.m.	**Justin Darnell***	Organizational Misconduct

April 15th, 2019, 1:00 p.m. - 2:15 p.m.

COLLEGE OF LIBERAL ARTS & COMMUNICATION, HUMANITIES & ARTS

BLACK RIVER ROOM

1:00 p.m.	**Oluwayinka Dada****	A Thematic Analysis of how Achalasia Patients Receive Online Social Support
1:15 p.m.	**Najma Akhther****	Virtual Stranger Loss, Parasocial Grieving and Mediatized Emotion: Celebrity Mourning Process on Social Media
1:30 p.m.	**Connor Scroggins***	Instrumental Musique Concrète: The Virtue of Nuance in the Sonic Experience
1:45 p.m.	**Gaberial Waters***	Controlling Musical Expression with Harmonic Structures

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* - Undergraduate ** - Graduate

* - Undergraduate ** - Graduate

April 15th, 2019, 1:00 p.m. - 2:15 p.m.

COLLEGE OF LIBERAL ARTS & COMMUNICATION, HUMANITIES & ARTS

WHITE RIVER ROOM

1:00 p.m.	**Jessica Martin***	College 101: Video Series to Help Prepare Freshmen to Live on a College Campus
1:15 p.m.	**Taylor Newman***	Friends: Gendered Speaking Then And Now
1:30 p.m.	**Alexandra Borchardt***	Spectrum: A Collection Of Original Poetry Conveying Themes Expressed Though Color Symbolism In Literature

April 15th, 2019, 2:45 p.m. - 4:00 p.m.

COLLEGE OF LIBERAL ARTS & COMMUNICATION - COMMUNICATION STUDIES

ARKANSAS RIVER ROOM

2:45 p.m.	**Rachael Brozynski***	A Girl in a Country Song
3:00 p.m.	**Brianna Coyle***	Female Body Image Through the Decades
3:15 p.m.	**Kathryn Taylor***	When Women are Power
3:30 p.m.	**Darla Thomas***	"Girls Need Love" Song Release Challenges the Ideas of Gender Communication

Concurrent Oral Sessions, Reng Student Union, 3rd Floor

College of Nursing & Health Professions
College of Education & Behavioral Science

April 16th, 2019, 8:30 a.m. - 9:45 a.m.

COLLEGE OF NURSING & HEALTH PROFESSIONS

ARKANSAS RIVER ROOM

8:30 a.m.	**Bridgette Davis***	Contributing Factors to Mental Health Issues Among International Students
8:45 a.m.	**Brooks Propst***	Sexual Assault and Emergency Department Nurses
9:00 a.m.	**Jessica Holsted** **Michelle Sarna**** **Dalton Craig**** **Kolton Crawford**** **Savannah Hogan****	The Effects of Using Blood Flow Restriction Exercise for Proximal Strength at the Shoulder
9:15 a.m.	**Nancy Baltz****	Developing an Instrument to Assess Diabetes Related Knowledge, Attitudes, and Practices of Primary Providers Regarding Foot Health
9:30 a.m.	**Lisa Schafer****	Screening for and Management of Adult Obesity

April 16th, 2019, 8:30 a.m. - 9:45 a.m.

COLLEGE OF EDUCATION & BEHAVIORAL SCIENCE

BLACK RIVER ROOM

8:30 a.m.	**Naoko Yoshimura***	The Impact of Parent Perceptions on Child Fundamental Motor Skill
8:45 a.m.	**Sarah Shaw***	Sexuality and Identity and their Relation to Bullying and Disconnection in Middle School
9:00 a.m.	**Lindsey Hart*** **Jennifer Reves*** **Olivia Peeler***	Considering Arts as Text: Depicting Social Activism Through Text Set Development
9:15 a.m.	**Emma Nwofor****	Sexual Harassment in the Sporting World: Should Women Toughen Up?
9:30 a.m.	**Brianna Sayer****	Effects of Foam Rolling for Delayed-Onset Muscle Soreness on Military Performance and Perceived Recovery

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* - Undergraduate ** - Graduate

* - Undergraduate ** - Graduate

Poster Session, Centennial Hall

College of Nursing & Health Professions

April 16th, 2019, 10:00 a.m. - Noon

COLLEGE OF NURSING & HEALTH PROFESSIONS

CENTENNIAL HALL

1	**Nicholas Jacques**** **Megan Etter****	Posturing Responses in Concussions: Boxing & Mixed Martial Arts Fighters
2	**Cynthia Teague****	Diabetes and Exercise: Improving Patient Outcomes
3	**Sarah Lowtharp****	Universal MRSA Decolonization Versus Screening and Isolation of ICU Patients
4	**Ryan Anderson****	Adherence is Key: Improving Hypertension Control through Education
5	**Broderick Sheard****	A Local Family Clinic's Treatement Rate for Treating Hyperlipidemia in Diabetic Patients According to 2018 ACC/AHA Guidelines
6	**Kellye Brown****	A West Memphis Clinic's Adherence to JNC 8 Guidelines for African American Patients
7	**Corey Dorman****	Colorectal Cancer Screening Rate of a Local Clinic in Northeast Arkansas
8	**Michael Gossett****	A Local Clinic's Influenza Vaccination Rate of COPD Patients Versus the National Average
9	**Jessica Holsted**** **Michelle Sarna**** **Dalton Craig**** **Kolton Crawford**** **Savannah Hogan****	The Effects of Using Blood Flow Restriction Exercise for Proximal Strength at the Shoulder
10	**Taylor Wilkes****	Comparing the Benefits of LLLT and Dietary Supplementation for Muscle Recovery Post Fatiguing Exercise
11	**Holly Wilmarth**** **Houston Talmage****	Pain Neuroscience Education for Physical and Occupational Therapy Students
12	**MaKenzie Hudspeth**** **Ashley Rash****	Chronic Pain and Personality Type
13	**William Bowen**** **Joe Looney****	Revisiting Microbial Resistance to Blue Light Therapy
14	**Laurell Gamblin****	Adherence to Alcohol Screening Guidelines within Primary Care
15	**Allyssa Sellmeyer****	Discussion of Advanced Directives with Primary Care Patients with Medicare
16	**Felica Woods****	A Retrospective Chart Review of Immunication Rates in COPD Patients in the Primary Care Setting
17	**Jeremy Lawson****	Depression Screening Rate in a Rural Health Clinic in Pemiscot County, Missouri, Compared to a National Rate of 4.2%
18	**Marka Ahrent****	A Rural Clinic's Patient Population Adherence to Gold Diagnostic Criteria for Using Pulmonary Function Tests in COPD
19	**Kasey Sharp****	Calcium Versus Bisphosphonate Treatment for Osteoperosis in Postmenopausal Women
20	**Michelle Snow****	A Look at the Rate of Provider Adherence to the Recommendations of Diabetic Foot Exams in a North Central Arkansas Primary Care Clinic
21	**Charity Lane****	Comparison of Rate of Statin Prescription in Diabetics
22	**Heather Polk****	A Primary Care Clinic's HPV Vaccine Rate Versus the National Average of 65.5%
23	**Chelsea Hendrix****	Adherence of Statin Therapy in Diabetic Patients
24	**Jena Shepherd****	Discussion of Advance Directives in Primary Care
25	**Alex Kurtzweil****	A Rural Arkansas Clinic Depression Screening Rate vs. the National Average
26	**Brittany Benton****	Chlamydia Reassessment Rates After Diagnosis in Central Arkansas
27	**Skyler Mankin****	Onset of Menses in Desha County Arkansas Versus the National Average of 12.8 Years
28	**Samantha Cawyer**** **Madison James**** **Thomas Sustich****	The Relationship Between Chronic Low Back Pain and Inspiratory Abilities
29	**Avery Turpin***	Effects of the Amount of Eggs in a Dessert
30	**Mary Daniel Johnson***	Testing Sensory Differences in Peanut Butter Compared to Sun Butter in a Prepared Recipe
31	**Anthony Ciaramitaro****	Influenza Risk Involving COPD and Adherence to Gold Guidelines
32	**Ashiqua Jackson****	Treating Hypertension According to JNC-8 Guidelines in African American Women
33	**Mackenzie Chambers****	Protection Against Influenza with Appropriate Immunization
34	**Victoria Johnson****	Antibiotic Use in Adults with Acute Bronchitis
35	**Alicia Earley****	Smoking Cessation Products Used as First Line of Defense
36	**Erica Dillard****	Evidence Based Clinical Practice Guideline for Diabetes

** - Undergraduate ** - Graduate*

37	**Jeffery Harris****	Does a Rural Clinic in Arkansas Meet the 100% Adherence Rate of the Prescription Drug Monitoring Program as Recommended by the State of Arkansas?
38	**Lindsay Sheets****	Are Patients with Erectile Dysfunction Receiving First-Line Medication?
39	**Rocio Roades****	COPD
40	**Helen Williams****	Are Women Ages 40 to 64 in a Local Health Clinic Being Referred for Mammography as Recommended By Clinical Guidelines Set by the ACS and How Do Rates Compare to the National Average of 64.8%?
41	**Michael Hall*** **Haylee Dragon***	The Importance of Patient Positioning in Diagnostic Imaging
42	**Koreanna Forster*** **Kirstin Bratton***	Chronic Shoulder Dislocation: An Imaging Case Study
43	**Rachel McCallister***	A Comparison of White and Brown Sugar in a Product Containing Coconut
44	**Kaylen Perkins***	Testing the Palatability of Whole Wheat Flour vs. All-Purpose Flour in Desserts
45	**Abigail McNatt***	Comparing Whole Wheat Flour Tortillas and White Flour Tortillas in a Dessert Recipe
46	**Jennifer Taylor***	Bringing the Flavor of Greece Into a Health-Conscious Community
47	**Braelen Hunt***	Nutritional Yeast as a Palatable Source of Vitamin B12 for Adolescents
48	**Sara Saucedo***	Consumption of a Vegan Diet: Provides Adequate Iron Intake to Prevent Iron Deficiency and Anemia
49	**Abbigale Carlyle***	Lemon Chia Seed Cookies
50	**Alyssa Cunningham***	Case Study: Radiation Therapy's Role in the Treatment of Pediatric Osteosarcoma
51	**Mariah Dykes***	Baylor Sexual Assault Scandal: Crisis Communication and Brand Reputation (**Colac Poster)

** - Undergraduate ** - Graduate*

Concurrent Oral Sessions, Reng Student Union, 3rd Floor

College of Education & Behavioral Sciences

April 16th, 2019, 10:15 a.m. - 11:30 a.m.

COLLEGE OF EDUCATION & BEHAVIORAL SCIENCE, PSYCHOLOGY

ARKANSAS RIVER ROOM

10:15 a.m.	**Lindsey Brochu***	Jumping & Concussing
10:30 a.m.	**Trevor Asher***	Functions of Music
10:45 a.m.	**Bryston Hickman***	The Effect of Judge Leadership Style on Jury Decision Making
11:00 a.m.	**Kassidy Ratz***	Jury Decision Making: The Effects of Witness Testimony and Crime Severity

April 16th, 2019, 10:15 a.m. - 11:30 a.m.

COLLEGE OF EDUCATION & BEHAVIORAL SCIENCE, PSYCHOLOGY

BLACK RIVER ROOM

10:15 a.m.	**Diana Huynh*** **Shelby Daniele*** **Leea Carver*** **Madalyn Crittenden***	Mindfulness Through Body Awareness: An Action Research Project
10:30 a.m.	**Lindsey Hall*** **Monica Pearcy***	Full STEM Ahead: Evaluating Thunder Over the Rock's STEM Fest for Informal Science Education Experiences
10:45 a.m.	**Darla Thomas*** **Megan Gunnels*** **Sara Brown*** **Taylor Shields***	Effects of Expert and Character Witness Testimony on Jury Verdicts in a Murder Trial
11:00 a.m.	**McKenzie Griffin***	Effects of Biofeedback on Stress and Anxiety in College Students at Arkansas State University

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* - Undergraduate ** - Graduate

* - Undergraduate ** - Graduate

Oral Session, *Arkansas River Room*
College of Sciences & Mathematics

April 16th, 2019, 1:00 p.m. - 2:30 p.m.

COLLEGE OF SCIENCES & MATHEMATICS, ARKANSAS RIVER ROOM

ARKANSAS RIVER ROOM

1:00 p.m.	**Dakota Dixon***	High Altitude Balloon Flight Forecasting and Historical Analysis
1:15 pm	**Emma Martin** **Kinley Davenport***	Assessing the Biodiversity of Aquatic Macroinvertebrate Assemblages in Northeast Arkansas Agricultural Ditches
1:30 pm	**Cristofer Calvo****	Hydroxyproline-O-Glycan Engineering in Tobacco Transient Protein Expression: Fish Il-22 and EGFP
1:45 pm	**Patrick Roberto****	Enhanced Bioproduction of Selected Antioxidant Stilbenoids in Peanut Hairy Roots
2:00 pm	**Abbas Karouni****	Production of Prenylated Stilbenoids in Cell Suspension Cultures of Peanut
2:15 pm	**Sepideh Mohammadhosseinpour****	Prenylated Stilbenoids as Potential Chemopreventive Natural Products for Triple Negative Breast Cancer

Poster Sessions, *Centennial Hall*
College of Sciences & Mathematics
College of Education & Behavioral Science

April 16th, 2019, 2:30 p.m. - 4:30 p.m.

COLLEGE OF SCIENCES & MATHEMATICS

CENTENNIAL HALL

52	**Amelia Atwell****	Evaluating Nutrient and Sediment Contributions to the Agriculturally Dominated Upper Cache River Watershed, Arkansas
53	**Andressa Alves Augusto****	Monitoring Water Quality in Eight Subwatersheds of the Strawberry River, Arkansas
54	**Justine Chester****	Correlating Water Quality Data to Fecal Coliform Counts
55	**Amber Spence****	Assessment of Seasonal and Agricultural Impacts of Water Quality in Bayou Deview Watershed, Arkansas
56	**Emma Martin****	Whole Effluent Toxicity (Wet) Testing in Two Agricultural Ditch Systems Using Pimephales Promelas and Ceriodaphnia Dubia
57	**Md Rokib Hasan** **Maria Elena Gonzalez Romero****	A Gene Editing Approach to Elucidate the Biosynthesis of Stilbenoids in Peanut
58	**Brett Hale****	Characterization of Microspore Embryogenesis in Soybean (Glycine Max)
59	**Peyton DeShazo***	A New Kjeldahl Digestion Technique for Analyzing Total Nitrogen in Plant, Soil, and Water Samples
60	**ChrisTina Okolo***	Synthesis and Antiproliferative Activity of Thiazolo-Androstenones Against Breast Cancer Cell Lines
61	**Jordan Fryman***	Nitration of 4-Np Using Nitrate Salts
62	**Kinley Davenport***	Assessing the Biodiversity of Aquatic Macroinvertebrate Assemblages in Northeast Arkansas Agricultural Ditches
63	**Jose Williams***	Assessing the Immune Modulating Effects of Plant-Made Catfish Interleukin-22
64	**Jennifer Taylor***	Georeferencing the Dragonfly (Order: Odonata) Collection Cataloged in the Arkansas State University Museum of Zoology
65	**Annie Savage***	Project Macroinvert: Bringing Mayfly (Ephemeroptera) Collections Out of the Dark at Arkansas State University
66	**River Watson***	Taxonomic Evaluation of the Goldstripe Darter, Etheostoma Parvipinne
67	**Rebecca Martin*** **Noah Smith***	Synthesis of New 2-Aminopyrimidines
68	**Kennith Swafford***	Optimization of the Elicitor Treatment in Hairy Root Cultures of Peanut for the Production of Bioactive Stilbenoids
69	**Krystian Roedel***	Elicitation and Purification of Prenylated Stilbenoids from Peanut Hairy Root Cultures of Peanut
70	**Chance Austin***	Molecular Cloning for Expressing Human Fibroblast Growth Factor-2 in Tobacco by-2 Cells
71	**Ramsey Auburn*** **Bailey McAlexander*** **Joshua Gray*** **Lauren Calhoun*** **Haitao Zhang****	Roles and Molecular Mechanisms of the Phosphor Regulation in Cap1 Functions
123	**Grant Dawson***	Helping the Herps: Restoring the Past for Arkansas State's Future

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** - Undergraduate ** - Graduate*

April 16th, 2019, 2:30 p.m. - 4:30 p.m.

COLLEGE OF EDUCATION & BEHAVIORAL SCIENCES

CENTENNIAL HALL

72	**Stephen Berry**** **Jacob McGowen**** **Makenna McGowen***	Rethinking Sin: Assessing the Structure and Content of the Seven Sins Inventory
73	**Jakob McGowen**** **Brandon Higdon**** **Makenna McGowen*** **Blake Higdon**** **Stephen Berry****	Resisting Temptation: Short Form Development and Validation of a Six Sins Inventory
74	**Shana Schneider****	Reading Instruction for English Language Learners: Tailoring Instruction for Secondary Students
75	**Melissa Clanton Kirkpatrick****	Read-Alouds: Lost in the Era of Accountability
76	**Ashley Goodson****	Literacy for ELL Students
77	**Raelynn Chapman****	Increasing Writing Achievement Through Evaluation Criteria Instruction
78	**Duncan Brown****	Adult Illiteracy Epidemic
79	**Tamara Henry****	Will Implementing School Uniforms Have a Positive Effect on Negative Student Behavior
80	**Tabitha Tucker****	Using Music During Transitions
81	**Sarah Hale****	The Impact of a School's Grade Level Configuration on Literacy Scores in Mid-Sized Arkansas Districts
82	**Kimberley Washington****	Student Reading Proficiency
83	**Brooke Pierson****	Reading Intervention for Ells: Recent Adolescent Immigrants
84	**Katherine Shelton**** **Garrett Tedford****	Effects of External Loading During Daily Living on Anaerobic Performance: A Review
85	**Julia Cothron*** **Sarah Grayson***	Poppin' Pills: Medication Misuse in Students
86	**VanKe'via Garner***	Sobriety Strategies for College Students
87	**Reagan Raper***	Preschool Physical Education Curriculum Development
88	**Kylie Brickey***	The Forces of Connected Learning and Unit Development for Middle School
89	**Shelby Daniele*** **Madalyn Crittenden***	Friend or Phone? Mindfulness and Phubbing in College Students
90	**Jeremy DeLon***	Practicality of the Functional Movement System in the General Population
91	**Hannah Freeland*** **Kayle Long***	Familiarization Sessions are Not Necessary for Sprint Assessments in Rugby Athletes
92	**Kasey Lody*** **Kennedy Brookfield*** **Abigail Lovell***	The Influence of Gender Stereotypes on the Perceptions of Stalking

April 16th, 2019, 7:00 p.m.

GODSPELL

FOWLER CENTER

Throw 'em to the Wolves, Business Pitch, Reng Student Union, 3rd Floor

Neil Griffin College of Business

April 17th, 2019, 8:30 a.m. - 9:45 a.m.

NEIL GRIFFIN COLLEGE OF BUSINESS

AUDITORIUM

Sandra Winfree*	The Coffee Café ***Remote presentation*
Theresa Craigo*	Healthier Habits ***Remote presentation*
Fadeel Aloqili*	Win Outfitter
Caitlin Archer*	Thankful Earth
Joel Haynes*	Joey's
Griffin Dunn*	Drain Champion
Hogan Sims Dailey*	Eagle Rock Outfitters
Amari James*	Kolossal Kuts
Kailee Hutchison*	Charity Hotel
Zachary Ray*	SafeGuard
Brendon Eminger*	Extraordinaire Soliare

create

* - Undergraduate ** - Graduate

* - Undergraduate ** - Graduate

Poster Sessions, Centennial Hall

College of Agriculture

College of Engineering & Computer Science

April 17th, 2019, 10:00 a.m. - Noon

COLLEGE OF AGRICULTURE & TECHNOLOGY

CENTENNIAL HALL

93	**Akash Lal**** **Amber Booth****	Analysis Of DNA Methylation To Understand Protein Accumulation In Transgenic Corn Seeds
94	**Naina Rao**** **Caroline Kelly**** **Callie Phipps*** **Brenna Cannon***	Floral Dip Transformation Of Camelina Sativa L. With A Myo-Inositol Oxygenase Gene To Potentially Improve Oil Yield
95	**Nikkolette Perkins***	Oxidation and Reduction Enzymes as Bioremedation Agents
96	**Brenna Cannon*** **Caroline Kelley**** **Callie Phipps*** **Brett Hale**** **Naina Rao****	Soybean Androgenesis from Floating Anther Culture
97	**Jessica Krob***	Geospatial Variability and Cotton Production- Profitability in a Northeast Arkansas Field

April 17th, 2019, 10:00 a.m. - Noon

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

CENTENNIAL HALL

98	**Gunnar Etzkorn***	Automated Paper Delivery Robot
99	**William Pretorius*** **John Contrell***	Heat Transfer Analysis: Multi-Fin
100	**Mdariful Hasan****	Neural Network Based Soil Resistivity Prediction for Arkansas
101	**Mohammad Nazmul Hassan****	Evaluation of Aggregate-Binder Compatibility Ysing Surface Free Energy Theory
102	**MMTariq Morshed****	Replacement of Conventional Elastic Recovery (ER) Test by Dynamic Shear Rheometer (DSR) Based Tests
103	**Kazi Tamzidul Islam****	Potential Use of Rice Husk Ash (RHA) in Asphalt Modification
104	**Christopher Jones****	Optical Momentum Reversal in Nanoparticle Surface Arrays
105	**Ashlyn Johnson***	Frameless Laser Harp
106	**Brian Hufty*** **Nicholas Garcia*** **Dustin Tran***	The Natural Frequency
107	**Elizabeth Compton***	Lower Body Powered Exoskeleton
108	**Elizabeth Compton***	Automated Material Transport System
109	**Ahlam Safouhi*** **Mohamed Adawi*** **Desmond Nyaho***	Development of a Programmable Logic Controllers Trainer for Industrial Project Simulation
110	**John Cottrell** **Rebecca Chen**	Bridge Structure Static and Vibration Analysis
111	**Abdalala Alsuwaij*** **Daniel Bope*** **Yuichiro Miyakawa*** **Preston Spencer***	Human Power Vehicle
112	**Abdalala Alsuwaij***	Steel Recycling Simulation
113	**Brandon Cole***	SAE Baja Drivetrain
114	**Brandon Cole***	SAE Baja Suspension
115	**Nicolas Thomas*** **Gunnar Etzkorn***	Pick and Place Robotic Arm
116	**Nicolas Thomas*** **Gunnar Etzkorn***	PMC Shaker Tower
117	**Rocklan McCall***	Continuous to Discrete Time Converter
118	**Kyler Dickey***	Tone Producing Tuning Device
119	**Ahmed Alsehali***	Laser Communication System
120	**Jadee Scott-Jones***	Battery Level Indicator
121	**Rebecca Chen***	DNA Entrapment Using Light-Matter Interaction in Nano-Patterned Arrays
122	**Dustin Tran*** **Wael Alqahtani***	3D Printing Technology with Two Photon Lithography

* - Undergraduate ** - Graduate

Throw 'em to the Wolves, Sales Pitch, Reng Student Union, 3rd Floor

Neil Griffin College of Business

April 17th, 2019, 10:15 a.m. - 11:30 a.m.

NEIL GRIFFIN COLLEGE OF BUSINESS

AUDITORIUM

Jenny Keller
Caleb Keating
Collin Cahill
Mary Conroy
Rainey Gibbs
Marisa Marquez
Shawna Martin
Beth Meister

Oral Session, Reng Student Union, 3rd Floor

NEIL GRIFFIN COLLEGE OF BUSINESS

AUDITORIUM

Alex Gookin*	Online Media Usage of Arkansas State University Students: Influence on Wellbeing, Motivation, and Learning

Concurrent Oral Sessions, Reng Student Union, 3rd Floor

College of Engineering & Computer Science

College of Agriculture

April 17th, 2019, 1:00 p.m. - 2:30 p.m.

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

BLACK RIVER ROOM

1:00 p.m.	**Clayton Liddell***	Analyzing the Adoption Rate of Local Variable Type Inference in Opensource Java 10 Projects
1:15 p.m.	**Sumon Roy****	Investigation of Moisture Damage of Asphalt Bidders Using the Atomic Force Microscopy (AFM) Techniques
1:30 p.m.	**Sandeep Aryal****	Unsteady Modeling on Fly Ash Deposition in Full-Scale Gas-To-Gas Heaters for Ultrasupercritical Pulverized Coal-Fired Power Plant Applications
1:45 p.m.	**MD. Saifujjaman****	Modeling for Mineral Redistribution of Blended Coals During Pulverized Coal Combustion
2:00 p.m.	**Santosh Tamang****	Analytical Modeling on Multiphase Heat and Mass Transfer in Full-Scale Gas-To-Gas Heaters for Ultra-Supercritical Pulverized Coal-Fired Power Plant Applications
2:15 p.m.	**Tamal Sarkar****	Electrostatic Stability And Optical Tunability Of Charged Particles In Inverted Systems: An Approach Towards Novel Tunable Surfaces

April 17th, 2019, 1:00 p.m. - 2:30 p.m.

COLLEGE OF AGRICULTURE

ARKANSAS RIVER ROOM

1:00 p.m.	**Neha Verma****	Hydroxyproline-O-Glycosylation in Monocot Plants and its Application in Cell Wall Engineering
1:15 p.m.	**Amber Booth****	Non-Coding RNA Influence on Manganese Peroxidase Quantity Variation in Isogenic Corn Lines
1:30 p.m.	**Joshua Byrd****	Plant-Produced Oxidation/Reduction Enzymes as Bioremediation Agents

April 17th, 2019, 2:45 p.m. - 3:45 p.m.

Demonstrations, Vaughn Student Lounge

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

April 17th, 2019, 4:00 p.m. - 5:00 p.m.

Awards Program and Reception, Auditorium

Oral & Creative Presentations

create

MALE DANCER'S GENDER ROLE IDENTITY CONFLICT AND ADAPTATION

Hyunwoo Ahn – Undergraduate
Hyunwoo.ahn@smail.AState.edu

Billy Elliot starts from a small village in England. This film let us think of the discovery of gender identities, the value of masculinity and femininity, and the recognition of each other's gender identities. Male professional dancers were having difficulty in establishing the gender role identity of the male professional dancer due to family's objection to be a dancer, friends' disrespect and tease about losing the masculine gender role, family's disrespect. Besides, male professional dancers came to question their gender role identity as they found their idea on men changing and their thinking and behavior having resembled women's since they began dancing. I was using gendered/sexed language, work, and gender in social institution to claim what gender discrimination happened and what is masculinity and femininity along with the scene in this film. Quotes and film were used to accomplish the research objectives for male professional dancers in professional dancers. This analysis is important to break through gender stereotypes and to create a society where everyone has the right to choose the job they want without discrimination.
Mentor: Sarah Scott, sscott@AState.edu

VIRTUAL STRANGER LOSS, PARASOCIAL GRIEVING AND MEDIATIZED EMOTION: CELEBRITY MOURNING PROCESS ON SOCIAL MEDIA

Najma Akhther – Graduate
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Within the context of 21st century digital culture, social media spheres have become crucial arenas through which mediated and parasocial relationship between celebrities and audiences unfold. In these new digital spaces, the topics of death, loss and mourning are increasingly encountered and negotiated. Accordingly, the expansion of death and grief has shifted from "sequestered death" in private spaces to "mediated death" in public spheres. This study explores mediatized death and emotion, specifically parasocial grieving on social media as depicted in different digital mourning practices. Employing mediatization theory, the researcher theoretically analyzes existing empirical studies to understand the relationships between parasocial grieving and mediatized global flows of emotion focusing on celebrity deaths. The study determines varied forms of mediatized emotional responses relating to high-profile celebrity deaths from global perspective. This study illustrates how temporal, spatial and social expansion of mourning-related information intertwine experiences of grief and loss with everyday social media practices, ultimately resurrecting the lives of celebrities worldwide. Findings suggest that social media shape mourning-related interactions and norms, in which parasocial grieving occurred online as a legitimate public space of mourning. The results will contribute to get insight on mediatized emotion and parasocial grieving, particularity in death and media studies.
Mentor: Steven Panageotou, spanageotou@AState.edu

UNSTEADY MODELING ON FLY ASH DEPOSITION IN FULL-SCALE GAS-TO-GAS HEATERS FOR ULTRASUPERCRITICAL PULVERIZED COAL-FIRED POWER PLANT APPLICATIONS

Sandeep Aryal – Graduate
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Ash deposition is one of the major concerns in the coal-fired power plants because the generated ash from the coal combustion travels with the flue gas and deposits on the heat transfer equipment causing them to fail or deteriorate their performance over time. The objective of this study is to model and investigate the impact of fuel quality on ash deposition by considering the combined effect of inertial impaction and thermophoresis, assimilating shedding factor for transient modeling in the low-temperature heat exchangers (gas-to-gas heaters). The single-tube approach with finite difference approximation method is applied to solve the governing equations for predicting ash deposition rates. The Stokes-based capture efficiency is used to predict inertial impaction while the thermal gradient is calculated to predict thermophoretic deposition. The modeling results show that the particles greater than 10 μm dominated deposition because inertial impaction rate was higher than thermophoretic deposition rate. The case studies suggest that lower rank coal in terms of ash incited more deposition than high rank coal. The calculated fouling factors and overall heat transfer coefficients show good agreement with the measured data from the baseline power plant.
Mentor: Dr. Kwangkook Jeong, Associate Professor, kjeong@AState.edu

FUNCTIONS OF MUSIC

Trevor Asher – Undergraduate
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Music matters to people, and not just for entertainment. People use music to serve different functions in their lives (Schäfer, Thomas, Sedlmeier, Peter, Städtler, Christine, Huron, David, 2013). Three important functions of music are emotion regulation, self-awareness, and social relatedness (identifying with others). Although the use of music to serve these functions is sometimes conscious, people sometimes go to music subconsciously. This study examines whether music majors and non-majors use music differently. As a music major, music is the linking factor between my friends and I as well as being one of the ways in which we define ourselves. A survey was given to 112 college students of various majors, including 28 music majors that were targeted for inclusion. I expected to find music majors using music to serve self- awareness and social relatedness functions more than non-majors. The results of the study showed that there was indeed a greater importance placed on social relatedness in music majors, but there was no difference seen between the two groups in emotion regulation or self-awareness. Music majors use music more to identify as a group than other students, but all appear to use music for emotion regulation and draw self-awareness.
Mentor: Dr. David Saarnio, dsaarnio@AState.edu

DEVELOPING AN INSTRUMENT TO ASSESS DIABETES RELATED KNOWLEDGE, ATTITUDES, AND PRACTICES OF PRIMARY PROVIDERS REGARDING FOOT HEALTH

Nancy Baltz – Graduate
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Diabetic foot disease (DFD) is associated with high mortality and morbidity. Healthcare professionals have an essential role in the prevention of DFD. Literature reviews reveal a paucity of research regarding knowledge, attitudes, and practices (KAP) of primary providers and an absence of validated tools to determine gaps in KAP. Establishing content validity and reliability is the initial phase of instrument development. As such, the purpose of this study is to develop an instrument to evaluate primary providers' KAP of foot health. The study employed a descriptive cross-sectional design conducted over two weeks. Following a critical review of the literature, analysis of American Diabetic Association (ADA) recommendations, and input from subject matter experts (SME), the survey was tested on a convenience sample of nursing professionals with achievement of a certified diabetic educator (CDE) status. The research data were collected using the "General Informational Data" and "Healthcare Professional KAP of DM Foot Health" via a Survey Monkey. Recommendations from subject matter experts (SME) were used to determine content validity and internal reliability. Ideally, this study improves primary providers' involvement in DM foot health, and additionally KAP information can be applied to developing theoretical and practical educational programs to improve health outcomes.
Mentor: Lisa Waggoner, lwaggoner@AState.edu

NON-CODING RNA INFLUENCE ON MANGANESE PEROXIDASE QUANTITY VARIATION IN ISOGENIC CORN LINES

Amber Booth – Graduate
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Biotechnology researchers are using plant transformation technologies coupled with established agricultural cropping systems to produce enzyme products more efficiently than ever before. In our plant breeding program, we use transgenic corn to produce enzymes important for industries. We select for lines that produce the highest enzyme yield, but we have observed phenomenon of variability in target protein production in increasingly isogenic lines. The purpose of my project has been investigating potential sources of variability. One focus is how protein production is affected by non-coding RNA. These are RNA molecules that are not translated into proteins but have been observed to influence protein production. We hypothesized that distinct populations of non-coding RNA in isogenic corn lines influence enzyme accumulation. We selected groups of high and low enzyme-expressing plant families to observe non-coding RNA populations. These groups were self-pollinated, and during gene activity, days 18 and 24 after pollination, embryos were harvested for RNA extraction. Enzyme quantity and total RNA quality were recorded. These findings will be analyzed with sequencing data and bioinformatic software to identify and categorize populations of non-coding RNA. These results should allow us to better understand the genetic basis of protein variation in transgenic corn lines.
Mentor: Elizabeth Hood, ehood@AState.edu

SPECTRUM: A COLLECTION OF ORIGINAL POETRY CONVEYING THEMES EXPRESSED THROUGH COLOR SYMBOLISM IN LITERATURE

Alexandra Borchardt – Undergraduate
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Color symbolism is the association of meaning to individual color pigments. Our society has placed symbolic meaning and emotions to a wide array of visible colors. These ideas, such as red equating love and blue representing sadness, are translated from culture to literature. Color symbolism in creative writing allows for the writer to communicate tone, mood and emotion in a way that allows the reader to infer meaning. This presentation will explore the use of color symbolism in writing through the creation of my own original poetry. These poems are based on themes such as red representing love, purple identifying wisdom, yellow portraying happiness, green embodying growth and blue exemplifying sadness. I will first read my poetry to the audience and then explain the methodology behind crafting the poems through use of color suggestive diction and imagery. This presentation will provide the audience with a contemporary way of approaching symbolism in literature and a unique look into the art of creating writing.
Mentors: Bryan Moore, bmoore@AState.edu Marcus Tribbett, mtribbet@AState.edu Michael Spikes, mspikes@AState.edu

JUMPING & CONCUSSING

Lindsey Brochu – Undergraduate
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A concussion is a traumatic brain injury that can lead to severe long term effects. Due to an increased awareness of the risk of head injury in contact sports, concussions have been a focus of research in recent years, especially in college athletics. The purpose of this study is to examine how much those youth know about concussions, a first step in decreasing the potential consequences from repeated trauma. In this study, using a 70-item test on short and long-term effects, college soccer and football players' knowledge about concussions was assessed, along with a comparison group of non-athlete college students. It was predicted that those who competed at the collegiate level would know more about concussions and answer more questions correctly. However, on average, athletes answered 68 percent questions correctly in comparison to 77 percent questions answered by their college peers ($t(114)=4.69$, $p<.001$). This shows despite the frequent occurrence of head injuries in those sports, and their previous experience with concussions, athletes require more education, which may lead to better recognition and reporting of concussions. This can help prevent repeated head trauma and create a safer environment for youth athletics.
Mentor: David Saarnio, dsaarnio@AState.edu

A GIRL IN A COUNTRY SONG

Rachael Brozynski – Undergraduate
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At any given moment a country radio station is playing a song that revolves around a perfect country girl with long tan legs wearing tight jeans always wanting to drive around in a pickup truck. Rising Artist's Maddie and Tae decide to go against the cliché and sing about how they are anything but a "girl in a country song." In this artifact analysis I will be breaking down the lyrics and the music video to the song "Girl in a Country Song." In this analysis, we will explore the gender norms in country songs and how Maddie and Tae's music video challenges these norms when they switch the roles of the sexy female to the male. "A Girl in a Country Song" lyrics also shows the power of language when Maddie and Tae showed disapproval of certain phrases that are often use to sexually objectified women in country songs.
Mentor: Sarah Scott, sscott@AState.edu

PLANT-PRODUCED OXIDATION/REDUCTION ENZYMES AS BIOREMEDIATION AGENTS

Joshua Byrd – Graduate
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Contamination of the environment directly impacts animal, plant, and human health and agricultural production. Persistent organic pollutants as well as insecticides, herbicides, pesticides, and industry waste including dyes for textiles and paper are common contaminants. A potential solution this project is offering relies on the use of enzymes from the white rot fungi Phanerocheate chrysosporium, manganese peroxidase (MnP), and from Trametes versicolor, laccase (Lcc), produced from genetically engineered corn to clean up those chemicals. The use of a supplementary enzyme, glucose oxidase, will allow the use of MnP in large amounts. This will allow the sequential use of the enzymes on a practical scale. The means of producing these enzymes are cost effective and are easily integrated to the already established corn industry. The recombinant enzymes have been used to successfully degrade and decolorize synthetic dyes. The results of this project will provide a cost-effective method of remediation and waste management in the agricultural and industrial field.
Mentor: Elizabeth Hood, ehood@AState.edu

HYDROXYPROLINE-O-GLYCAN ENGINEERING IN TOBACCO TRANSIENT PROTEIN EXPRESSION: FISH IL-22 AND EGFP

Cristofer Calvo – Graduate
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Plant-based recombinant protein production is emerging as a promising approach with significant advantages in cost and safety over other eukaryotic and prokaryotic expression systems. Despite the advantages of plant recombinant proteins, the most important bottleneck that limits the commercialization is the low protein yields. Plants have a unique type of O-glycosylation that has potential to enhance the stability and solubility of recombinant proteins expressed using plant platforms. Specifically target gene sequences are fused with a sequence to code for hydroxyproline-O-glycosylated peptide (HypGP) tags. These tags serve to modify the recombinant expressed protein with protective sugars to improve physicochemical stability during purification as well as employment and delivery of the recombinant protein. Therefore, the overall goal of this project is to understand how these HypGP tags affect protein expression, purification and bioactivity using tobacco transient expression system as a biofactory. We have targeted the expression of two model proteins to characterize this HypGP technology: a very unstable rainbow trout interleukin 22 (IL-22) and a readily-monitored enhanced GFP (eGFP). The "sugar coated" IL-22 expression is significantly enhanced over the untagged protein and can be successfully purified. To understand the underlying mechanism of HypGP modification process of recombinant expressed proteins, we explored the impact of plant stressors such as drought for increasing expression and recovery of sugar coated eGFP in an effort to optimize the Hyp-O-glycosylation technology.
Mentors: Jianfeng Xu, jxu@AState.edu Maureen Dolan, mdolan@AState.edu

THE TRANSGENDER BAN IN THE MILITARY

LaShundra Clark – Undergraduate
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The United States Secretary of Defense lifted the ban against transgender individuals who met certain criteria serving openly in the military in June 2016, until a couple of weeks ago when President Donald Trump put the ban back into action. The purpose of this research is to analyze the transgender ban. The methods used in this research is textual analysis to analyze the transgender ban in identifying biological theories, body politics, and gendered language marked and unmarked. A person who is identified as a transgender is an individual who recognizes that he/she is born male or female but feel as if they do not fit in the gender and sex to which they were assigned at birth. Whereas Trump bans transgenders from the military, transgenders should be able to serve in the military given that everyone should be treated equally and that the ban is causing harm to their self. This shift is accompanied by policy changes, directives and additional information that can be difficult for mental health providers to navigate. Transgenders can serve in the military but only if they do so in their biological sex, not as the gender they may identify with and if they have taken no steps to transition. By banning transgenders from the military, it harms the military readiness and ability to recruit and retain talent. The new memorandum says that transgender individuals with a history of gender dysphoria are barred from military service "except under certain limited circumstances."
Mentor: Sarah Scott, sscott@AState.edu

FEMALE BODY IMAGE THROUGH THE DECADES

Brianna Coyle – Undergraduate
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The ideal body image of a woman has dramatically changed throughout the decades. Part of this is because a lot of the ideas of the "perfect body" for a woman come from fashion, movies, music, and celebrities. Currently, women all across the country are trying to get that "Kim K" body. This is an hourglass figure, which is a voluptuous body. This includes having a bubbly butt, small waist and a bigger bust. Furthermore, the present-day ideal woman is likely tall. On the other hand, in the 1920s, it was more attractive for a woman to be more petite and slender - not curvy in any form. Women during this time period also covered their breasts at all times. However, the sex appeal during this time period is the hemline. This was the time period when skirts and dresses were getting shorter. Showing a glimpse of the knee was considered scandalous at this time. Body ideals are ever-changing with the current trend.
Mentor: Sarah Scott, sscott@AState.edu

QUEER BLACK REPRESENTATION IN MODERN TELEVISION

Emily Crawley – Undergraduate
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Media's portrayal of the queer black teenager has become redefined in Netflix's Sex Education. Eric Effiong, played by British-Rwandan actor Ncuti Gatwa, is the gay best friend of the show's protagonist, Otis Milburn. However, Eric defies the "gay best friend" stereotype in almost every way and becomes an important icon for society. The purpose of this paper is to explain how Eric is the representational force that many teens need to see portrayed on television. Through textual analysis I will examine Eric's intersectional identities, family relationships and clothing choices. I will look at how Eric deals with his race and sexuality through being a "minority in a minority." This also relates to Eric's family, who are deeply religious African Americans. More specifically his father, who Eric is seen interacting with most often out of his parents. I will also look at Eric's elaborate clothing and vibrant style which are qualities that most males do not look for in clothing. Sex Education is important to communication in gender because Eric challenges the stereotypical idea of masculinity and plays a huge role in representation of minorities.
Mentor: Sarah Scott, sscott@AState.edu

A THEMATIC ANALYSIS OF HOW ACHALASIA PATIENTS RECEIVE ONLINE SOCIAL SUPPORT

Oluwayinka Dada – Graduate
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Achalasia is one of the rarest and stealthily chronic esophageal motility disorders and has a high risk of resulting in esophageal cancer. People with achalasia feel helpless and sometimes embarrassed by their condition, and many accept it as normal and even shy away from discussing their plight with anyone. However, these people might feel comfortable seeking support online from people with similar conditions. Research suggests that the internet has become a common place/space for support giving and provision because of its anonymity, limited space and time constraints. Although there have been studies on achalasia treatments and types, there is no known research about how those affected by the disorder receive and provide support online. To fill that gap, and to contribute to existing literature on less-popular illnesses and online social support, this study aims to examine online social support among achalasia patients. The current study will use a thematic analysis to examine how social support is expressed and communicated among achalasia patients in a Facebook group. Results will offer insight as to how achalasia patients receive and offer social support online and will help scholars and advocates better understand the support needs of achalasia patients so as to offer intervention initiatives.
Mentors: Dr. Gilbert Fowler, gfowler@Astate.edu Dr. Dinah Tetteh, dtetteh@AState.edu

ORGANIZATIONAL MISCONDUCT

Justin Darnell – Undergraduate
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"Our organization will not tolerate any form of sexual harassment. Any Team Member who engages in any such harassment shall be subject to disciplinary action, which may include, without limitation, suspension or termination." I have been an employee with this organization for about three years currently. I have observed that sexual harassment seems to be innocuous and a matter of unimportance to some employees within the company. In this paper I will analyze the actions of the employees who ignore this policy. I will specifically analyze how the female sex and claimed genders of other employees are affected by the actions of other coworkers who reject the policy and procedure. I will utilize the organizations employee handbook to reference these actions and determine if consequences for concerning sexual harassment are being utilized or ignored by upper level management. Another focal point in this paper will be gendered/sexed communication in the workplace in conjunction with a hostile work environment and its effects on employee performance. Much importance will be placed on how female objectification is an issue among male employees in this organization. I will also place a strong emphasis on the resistance among employees and how those actions affect communication among the diverse genders in the organization.
Mentor: Sarah Scott, sscott@AState.edu

CONTRIBUTING FACTORS TO MENTAL HEALTH ISSUES AMONG INTERNATIONAL STUDENTS

Bridgette Davis – Undergraduate
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As universities compete globally to attract the best students, there is a need to address the unique concerns of their international students. According to data from forbes.com, there were 808,640 international students in the United States in 2017. Various research reports indicate international students experience multiple stressors related to acculturation, language barriers, educational system, social support, and crisis situations. Due to exposure to these multiple stressors, international students are vulnerable to developing mental health disorders such as anxiety, depression, and stress-related disorders. These illnesses can impact the student in many aspects including academia. Due to critical cultural differences in basic beliefs and the stigma attached to mental illness, international students are less likely to seek mental health counseling. Group counseling is one mode of intervention that has been used to address international students' mental health concerns. Due to the diversity of the international students, any type of intervention targeting this population must consider the ethical and cultural implications.
Mentor: Dr. Rejoice Addae, raddae@AState.edu

HIGH ALTITUDE BALLOON FLIGHT FORECASTING AND HISTORICAL ANALYSIS

Dakota Dixon – Undergraduate
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The Arkansas BalloonSAT group has recorded and archived atmospheric data over the course of 54 missions since 2007. The archived data includes atmospheric pressure, humidity, temperature, velocity and GPS coordinates. Analysis of said data through simulation of a series of payloads suspended from a bursting balloon can help understanding of previous flights and predictions of future flights. During a mission, a digital radiosonde is used to sense environmental conditions. Historically, this flight data is analyzed manually. We report the development and testing of new analysis software built using the Python programming language. For each new or archived mission, our flight analysis program computes flight conditions and generates assorted geospatial plots. For example, this program graphically plots the velocity in relation to altitude, calculates the drag coefficient, and landing speeds. Analysis of archived data from previous Arkansas BalloonSAT missions yields desirable calculated data for understanding high altitude balloon flights of the past, present and future.
Mentor: Dr. Ross Carroll, bcarroll@AState.edu

ONLINE MEDIA USAGE OF ARKANSAS STATE STUDENTS: THE INFLUENCE ON WELLBEING, MOTIVATION, AND LEARNING

Alex Gookin – Undergraduate
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As technology has advanced the internet has evolved from a research only platform to something that encompasses almost every aspect of people's lives. As time has moved forward the amount of internet usage for various activities (entertainment, social interactions, commerce, etc.) has increased. While the repercussions of people spending more time online are still widely unknown, it is also certain that in recent years young people have become more prone to a lack of motivation, confidence, and general wellbeing. College students represent a portion of the population that likely spend a lot of time online and thus are a good target population for this research. The data will identify any relationships between online media consumption and the test variables of wellbeing, motivation, and learning. In the presentation, results from survey data using AState students will be shared. Implications will also be discussed.
Mentor: Dr. Sarath Nonis, snonis@AState.edu

EFFECTS OF BIOFEEDBACK ON STRESS AND ANXIETY IN COLLEGE STUDENTS AT ARKANSAS STATE UNIVERSITY

McKenzie Griffin – Undergraduate
mckenzie.griffin@smail.AState.edu

Biofeedback is used in a growing number of counseling clinics and similar venues to help clients manage anxiety or stress. This study examined whether biofeedback changed nonclinical levels of perceived general anxiety and stress regardless of situation. Undergraduate students were recruited to use biofeedback devices off and on every other week or every two-weeks for a total of four or eight weeks, following an A-B-A-B single subject design (N=7). During weeks with biofeedback, device usage frequency and time duration varied by individual. Participants completed three instruments at the beginning and the end of each period to assess their levels of stress, anxiety and perceived coping ability. Stress was measured using a modified Perceived Stress Scale (PSS), anxiety was measured using a revised Generalized Anxiety Disorder 7-item scale (GAD), and perceived coping ability was measured using the Coping and Self Efficacy scale. All assessments were analyzed to determine if stress, anxiety and coping levels changed for each participant over the course of the sessions. Results for select individuals reflected positive changes (i.e., decreased levels of stress and anxiety and increased coping ability), but attrition in the sample occurred. To that end, the effectiveness of biofeedback will be discussed in response.
Mentors: Amy R. Pearce, apearce@AState.edu Irina Khramtsova, ikhramtsova@AState.edu Heloisa Cursi-Campos, hcursicampos@AState.edu

FULL STEM AHEAD: EVALUATING 'THUNDER OVER THE ROCK'S STEM FEST' FOR INFORMAL SCIENCE EDUCATION EXPERIENCES

Lindsey Hall – Undergraduate
lindsey.hall@smail.AState.edu

Monica Pearcy – Undergraduate
monica.pearcy@smail.AState.edu

Science festivals are an important form of informal science education (ISE) that focus on providing an environment in which the public has an opportunity to encounter science, technology, engineering and mathematics via hands-on experiences. As reported in published literature, science festivals can inspire interest and curiosity in STEM fields. In October 2018, professors and students of Arkansas State University traveled to the Little Rock Air Force Base to participate in "Thunder Over the Rock's STEM Fest" by collecting survey data from attendees of the multi-day festival (N=177). Festival coordinators designed events to engage attendees in STEM-related activities in hopes of educating the public on careers available within STEM disciplines. An attendee survey composed of Likert-type scales and demographic questions measured the impact of festival experiences and captured attendee characteristics via sample of convenience. Collected data helped researchers establish which individuals were most positively impacted by this festival. Of those surveyed, 71 percent ($p = 0.026$) reported feeling inspired by a STEM-related activity they participated in at the festival. Further results will assist in determining overall impacts of science festivals within communities and how best to generate new or continued interest in such events among future attendees.
Mentors: Dr. Karen Yanowitz, kyanowitz@AState.edu Dr. Amy Pearce, apearce@AState.edu Dr. Anne Grippo, agrippo@AState.edu

CONSIDERING ART AS TEXT: DEPICTING SOCIAL ACTIVISM THROUGH TEXT SET DEVELOPMENT

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Three future middle school English teachers collaborated over a semester to develop extension text sets from their instructor's anchor text entitled, "Hope and Faith Rising from Racism and Darkness." They explored their teacher's model to discern how learners can create their own text sets around social activism using various art forms as text. Using action research from literacy experts (Robb, 2002; Allington, 2002) and examples from high-quality, contemporary educator websites (readwritethink.org; middleweb.com), plus their own insights and interests about the inclusion of art as "text," the presenters each developed text sets resonant of the original theme from the instructor model. One spotlighted the art form of music by collecting historical and contemporary protest anthems from civil rights movements. Another curated photographs and artistic representations of slavery and the Civil War. The last developed a collection of biographies of African-American leaders, inventors, and artists. Two key outcomes included: 1) valuing classic and contemporary texts alongside one another to offer learners the chance to value the historical legacy of canonical texts and the tensions depicted in the art/text of today's social justice tensions; and 2) using teacher decision-making to recognize relevant forms of text that include art centered in social issues.
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THE EFFECT OF JUDGE LEADERSHIP STYLE ON JURY DECISION-MAKING

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Considering the negative impacts criminal convictions can have on lives, it is important to mitigate any extraneous variables on which these convictions are made by a jury. This includes how the judge as leader of the courtroom behaves and interacts with the jury as followers, defined as leadership style. Based on prior leadership research, it was predicted that differences in a judge's leadership style would result in differences in verdict decision-making by the jury. Three audio recordings were created, each of a judge utilizing one of Lewin's three original leadership styles - democratic, authoritarian, and laissez-faire. Participants in this study listened to one of these recordings before and after listening to a mock trial, afterwards selecting their verdict for the defendant in the trial. Data examination found that participants' verdict decisions did not significantly differ based on the leadership style of the judge. This is promising, as it could indicate that judge leadership style does not actually affect the verdicts of jury members in courtroom trials. As this is the first study ever conducted on judge leadership styles, more studies would have to be conducted to support the results. Future studies should be conducted in an actual courtroom setting.
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THE ULTIMATE ISSUE, A LOOK AT GENDER IN COED ULTIMATE FRISBEE

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"As a girl you'll have to take a good long time on the field to prove what you can do." This quote came from an online discussion about why females in my Coed Ultimate Frisbee summer league were feeling left out and under-appreciated in comparison to their male teammates. I will be doing a textual analysis of an online discussion about the problems that exist in coed Ultimate Frisbee. The first aspect I will be looking it is body movement, how people move, act travel in everyday life, and how movement norms affect how females play Ultimate and interact with other players. Secondly, I will be looking at how gender markings affect how females are viewed in this sport. I will also consider how social learning plays a role in the gender bias. My findings show that women have to prove themselves in a coed league, and because of what men have learned from society, females often don't even get that chance. These findings are important to find how communication between genders can impact sports.
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THE EFFECTS OF USING BLOOD FLOW RESTRICTION EXERCISE FOR PROXIMAL STRENGTH AT THE SHOULDER

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This study is designed to assess the effects of blood flow restriction (BFR) on strength gains in muscles located proximal to the tourniquet in the upper extremity. Our hypothesis is that more strength gains will be achieved with the BFR group. Research will be conducted in the Red Wolf Center two times weekly for four weeks. The subjects will be randomly assigned to one of two groups: BFR experimental group and traditional strength training control group. The BFR group will receive BFR exercise by performing strength training at 20-30 percent of the subject's one repetition maximum. The control group will follow the standard American College of Sports Medicine strength and hypertrophy protocol for resistance training by exercising at 60-80 percent of a one repetition maximum. Following each session, each subject will be given a nutritionally approved protein shake that consists of one scoop of protein powder and water. Outcome measures will be assessed pre and post the four-week intervention. The study is still in progress. At the end of the study, statistics will be completed to determine if there are proximal strength gains at the shoulder using BFR versus traditional strength training protocol.
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MINDFULNESS THROUGH BODY AWARENESS: AN ACTION RESEARCH PROJECT

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Mindfulness is the ability to pay attention to one's thoughts and emotions in a non-judgmental way while being aware of the here and now. Research has shown that practicing mindfulness has many benefits including increased psychological well-being and improved behavioral regulation (Keng, Smoski, & Robins, 2011). The study investigated the effectiveness of a two-week mindfulness training involving three techniques: counting breath, emWave biofeedback, and progressive muscle tension/relaxation. 58 participants were exposed to the concept and practice of mindfulness. Mindfulness was measured before and after the intervention through the Five Facet Mindfulness Questionnaire (Brown, & Ryan, 2003). A content analysis of the participants' responses to open-ended questions about their experiences revealed whether the intervention was beneficial. All three3 practices were found to be effective by the majority of participants and resulted in some degree of relaxation. The overall mindfulness means of the participants increased from 3.19 to 3.39 ($p<.01$). Among the five facets, the most significant increase was found for the ability to observe ($M=3.77$, $SD=0.86$) and non-react ($M=3.14$, $SD=0.66$). The positive results that the participants most frequently reported were that they were more relaxed, less stressed, and had higher focus.
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PRODUCTION OF PRENYLATED STILBENOIDS IN CELL SUSPENSION CULTURES OF PEANUT

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Prenylated stilbenoids are inducible defense compounds found in a few plant species such as peanut that have potential applications in human health such as anticancer, antiviral and anti-obesity agents. In order to study the biosynthesis of these compounds, cell suspension cultures are an attractive alternative biological system when compared to the entire plant. To this end, callus cultures were established from leaf explants obtained from plantlets of peanut and then placed in medium containing picloram or benzylamine purine with 2, 4-dichlorophenoxyacetic acid. After six weeks, the callus was transferred to liquid medium to start cell suspension cultures. To induce the production of prenylated stilbenoids, the cultures were co-treated with the elicitors methyl jasmonate, cyclodextrin, hydrogen peroxide and magnesium chloride. Prenylated stilbenoids were extracted from the culture medium after 192 hours of elicitor treatment and then analyzed via high performance liquid chromatography. The cell suspension cultures secreted into the culture medium the non-prenylated stilbenoid resveratrol and its analogues prenylated stilbenoids arachidin-1, arachidin-2, arachidin-3, and arachidin-5. This study has shown that cell suspensions cultures of peanut are capable of producing prenylated stilbenoids, and thus these cultures may provide a useful system to study the biosynthesis of these bioactive compounds.
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ANALYZING THE ADOPTION RATE OF LOCAL VARIABLE TYPE INFERENCE IN OPENSOURCE JAVA 10 PROJECTS

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In the world of computer science, "efficiency and ease of use" is the name of the game. This holds true such to the point that the aim is to not only design programs that are efficient and easy to use, but also to design efficient programming languages that facilitate ease of use. Certain features, such as Type Inference, are used in programming languages to improve ease of use; however, they often come at a cost. Type Inference is a feature in programming languages that allows for the type of a variable to be determined without it being specified. The development sector is rife with debate surrounding Type Inference in modern day programming languages and, more specifically, concerning whether the costs associated with Type Inference outweigh the benefits. In this study, the popularity of Type Inference was evaluated through analysis of popular opensource Java projects. The study will show that Type Inference in opensource Java 10 projects has not received widespread adoption. Additionally, potential reasons for this lack of usage will be discussed concerning the information gathered from the performed empirical study, which involved statically analyzing six popular open source Java 10 projects.
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ASSESSING THE BIODIVERSITY OF AQUATIC MACROINVERTEBRATE ASSEMBLAGES IN NORTHEAST ARKANSAS AGRICULTURAL DITCHES

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Agriculture in Arkansas is a $3 billion/year industry with 41% of land devoted to the industry. Runoff from farmland collects in ditches and often contains contaminants that negatively affect water quality and the aquatic life therein. These ditches are historically understudied, but can support a wide variety of both flora and fauna. Aquatic macroinvertebrates are one such group that have a wide range of sensitivities to pollutants making them good indicators of water quality and ecosystem health. The purpose of this study is to quantify macroinvertebrate diversity in two agricultural ditch systems in northeast Arkansas to assess water quality. Methods based on the US EPA Rapid Bioassessment Protocols and published studies were used to collect macroinvertebrates from six sites in two watersheds in April and September 2018. Organisms were preserved in 70% ethanol and transported to the Ecotoxicology Research Facility at Arkansas State University for identification using insect keys, and additional literature for non-insect taxa. Using multiple diversity indices, these ditches were assessed to have overall poor water quality and no significant difference between watersheds, although slight improvements in abundance and species richness were measure between seasonal surveys.
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COLLEGE 101: VIDEO SERIES TO HELP PREPARE FRESHMEN TO LIVE ON A COLLEGE CAMPUS

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The first year of college is a big transition for any student. It's a huge switch from a strict school schedule with the same people for years. Many prospective students, after having chosen a college to attend, descend on YouTube furiously searching for any and all advice videos in an attempt to prepare themselves for the challenges that lie ahead. The goal of the College 101 video series is to provide short and quality factual information for prospective students. The topics in this series include Packing for College, the Syllabus and Books, and Socializing and the First Year Experience (FYE). Each video is scripted and lasts between three and 10 minutes in length. Each video is accompanied by a blog post which goes into more detail on each topic and are supported by academic, reliable sources and not just personal opinions. While the posts are written the videos are not yet completed, therefore nothing has been posted and quantifiable results are not available at this time.
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PRENYLATED STILBENOIDS AS POTENTIAL CHEMOPREVENTIVE NATURAL PRODUCTS FOR TRIPLE NEGATIVE BREAST CANCER

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Breast cancer is the most prevalent type of cancer in women worldwide. Triple negative breast cancer (TNBC) is known to be the deadliest type since it does not respond to hormonal treatments. Therefore, there is an ongoing search for new treatments to increase survival rates for this disease. The goal of this study is to identify plant natural products for the prevention and treatment of TNBC. To this end, the cytotoxicity of prenylated stilbenoids from peanut was studied in the TNBC cell line MDA-MB-231. Prenylated stilbenoids were produced in peanut hairy root cultures and purified via semi-preparative high performance liquid chromatography. Cytotoxicity assays showed that the prenylated stilbenoids exhibited higher cytotoxicity to the cancer cells than non-prenylated stilbenoids. Furthermore, the increased cytotoxicity correlated with increased levels of the apoptosis (programmed cell death) markers caspase-3 and caspase-7. This highlights the significance to continue research with prenylated stilbenoids in TNBC. Current studies focus on elucidating the signaling pathways affected by these compounds in TNBC cells in order to advance our understanding of the anticancer mechanisms of these natural products.
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HYDROXYPROLINE-O-GLYCOSYLATION IN MONOCOT PLANTS AND ITS APPLICATION IN CELL WALL ENGINEERING

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Switchgrass (Panicum virgatum) is a perennial C4 grass that has been most extensively studied as a dedicated bioenergy crop. However, efficient conversion of switchgrass biomass to biofuels has been hampered by biomass recalcitrance. Genetic modification of the plant cell wall represents a promising solution to overcoming this problem. The goal of this project is to leverage an innovative strategy, the hydroxyproline (Hyp)-O-glycosylation "code", for de novo design and engineering in switchgrass of novel designer biopolymers (DBPs) to facilitate cell wall reconstruction. Designer biopolymers comprising two major types of cell wall glycoproteins; an extension module consisting of 18 tandem repeats of a "Ser-Hyp-Hyp-Hyp-Hyp" motif or (SP4)18 and an arabinogalactan protein module consisting of 32 tandem repeats of "Ser-Hyp" motif or (SP)32, were each expressed in switchgrass and rice as fusions to a green fluorescence protein via both transient and stable transformation. The Hydroxyproline-O-glycosylation of the engineered designer biopolymers was characterized. The results from this study show; embryogenic switchgrass calli were successfully generated, the engineered recombinant HypGP tagged EGFPs {(SP)32-EGFP and (SP4)18-EGFP} were Hyp-O-glycosylated in switchgrass and rice, in whole plants or cultured cells, the Hydroxyproline-O-glycosylation of the HypGP tag can be performed by monocot plants the same as in dicot plants and no phenotypic significant difference of transgenic plants was observed.
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FRIENDS: GENDERED SPEAKING THEN AND NOW

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The television show "Friends" is an iconic sitcom of the 90s, and as of late, has become a binge-worthy series of this generation. However, watching it now, one may notice that it seems a little more offensive than it was perceived when it first aired. This show regularly enforced stereotypical, heteronormative gender norms including, but not limited to, practicing body-shaming, expressing transphobia, and toxic masculinity. Some say that this is due to the lack of understanding of these issues, or if these issues were not as openly discussed as they are today. Regardless, these issues stick out like a sore thumb when watching today. I will do a textual analysis using a critical gendered lens of this TV show in order to evaluate the way they portrayed gender roles and expectations in that time, how it may have impacted the way its viewers understand those expectations, and if they are still relevant in today's society.
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SEXUAL HARASSMENT IN THE SPORTING WORLD: SHOULD WOMEN TOUGHEN UP?

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Sexual harassment has become a global epidemic across all aspects of society, especially for women within the sporting world. There are multiple examples of sexual harassment under the two main branches, 'quid pro quo' (expected in return for something) and 'hostile work environment' (unwelcomed comments and behaviors). Examples include women being harassed when in high administrative roles, sexual connotations about a female spread through social media and harassment towards athletes from coaches. This study will focus on sexual harassment towards female athletes from medical staff. The methodology used will be a systematic literature review of research published after 2016 targeting specific cases in sport which involve intrusive behavior towards female athletes from, but not limited to, male or female athletic trainers, physical therapists, chiropractors and acupuncturists. The literature that fits the criteria will then be examined in terms of sport, age, duration and country to increase the awareness and understanding of sexual harassment. A deeper understanding of why sexual harassment occurs is urgently needed, yet due to the sensitivity of this area, research has been limited and is currently not a true representative of the reality of this global issue in sport.
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HALESTORM: A CRITICAL ANALYSIS OF GENDER PERFORMANCE IN TODAY'S MUSIC INDUSTRY

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The role of gender indirectly controls people's behavior, especially people who are in the public eye, such as musicians. Gender influences the way musicians act and dress, the types of music and videos they produce, and the way they are perceived by the audience. The purpose of this paper is to use textual analysis to analyze Halestorm, a contemporary rock band most known for their lead female vocalist. Through a gendered lens, I will see how gender affects the way the group is perceived by and portrayed through the media, as well as how it influences their position in the music industry. I will also examine how the presentation of the band members' physical bodies and clothing styles are influenced by the gender expectations of society. I predict that my findings will show that Halestorm adheres to most of the gender norms in place to remain a successful band in an oversexualized business. Drawing attention to these ideas can lead to beneficial changes in gender expectations within the world of entertainment and beyond.
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SEXUAL ASSAULT AND EMERGENCY DEPARTMENT NURSE

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Sexual assault is a major topic of discussion in current media. Because of this, nurses should emphasize extreme importance on their personal perceptions of victims of sexual assault. To address this topic, the researcher sought to determine if sexual assault experiences, whether personal or professional, affects the care that is delivered by emergency room nurses towards patients that are victims of sexual assault. Licensed practical nurses, registered nurses, and advanced practice registered nurses that work in the emergency department were surveyed. A questionnaire with an open response section was unitized. Findings suggest that the best nurses to assign to patients of sexual assault would be those who have had Sexual Assault Nurse Examiner (SANE) training, who know someone who has been a victim of sexual assault, or who has professional experience in the care of sexual assault victims. These nurses are able to provide the best passion and empathy towards the victims. Findings also suggest that nurses who are victims of sexual assault may not be the best to assign to the care of these victims due to reliving their own trauma.
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JURY DECISION MAKING: THE EFFECTS OF WITNESS TESTIMONY AND CRIME SEVERITY

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In many cases, eyewitness testimony is used as evidence to attempt to prove the defendant's innocence or guilt. There is substantial evidence suggesting that eyewitness testimony is unreliable and often inaccurate, yet jurors often put a lot of faith in witnesses despite this fact. As well, research by Thomas and Peters (2017) found that there may be evidence to suggest that even when witnesses state that the defendant is innocent, jurors may make a guilty verdict anyway. It also found that participants may need significantly more witness statements to convince them of a defendant's innocence than of a defendant's guilt. The research being conducted is an extension of Thomas and Peters altering the trial to a more serious crime (i.e. murder). Participants are given information concerning a trial in which the defendant is accused of murder and separated in to pro-defense or pro-prosecution eyewitness statement conditions. They are then presented with the eyewitness statements, and asked to select as many statements as they need until they can make a verdict. This research is ongoing. Approximately 100 participants have been gathered so far, and collection is expected to be completed by April 1.
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WOMEN, HUNTING, AND SOCIAL MEDIA: DEFYING TRADITIONAL GENDER NORMS

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The purpose of this project is to analyze the perceptions of women in hunting in today's society by applying three concepts of gender in communication. I will be conducting a textual analysis by examining social media accounts of female influencers in the world of outdoor activities, such as hunting and fishing. I will first look at how attractiveness and objectification effect an account's popularity and number of sponsors an influencer receives. I will then evaluate the gender norms that are challenged and how women counteract the presumed role. By analyzing comments I will determine how the sexualization of women is connected to online harassment. Initial impressions suggests women in hyper-masculine sports, such as hunting, present themselves in a hyper-feminine way to balance the assumed gender role. This research sheds light on the ways women are stereotyped in masculine disciplines and how one often adjusts or overcompensates to be accepted in the field.
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ENHANCED BIOPRODUCTION OF SELECTED ANTIOXIDANT STILBENOIDS IN PEANUT HAIRY ROOTS

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In humans, oxidative stress is associated with several illnesses including cancer and neurodegenerative disorders. Dietary antioxidants such as resveratrol have been shown to inhibit oxidative stress in cell culture and in vivo. However, the poor bioavailability of resveratrol in humans limits its pharmacological activity. Prenylated analogs of resveratrol produced in peanut may exhibit similar biological activity with resveratrol and potentially enhanced bioavailability. To this end, the goal of this project is to characterize the antioxidant activity of select prenylated stilbenoids. To produce the prenylated stilbenoids, peanut hairy root cultures were treated cyclodextrin alone or in combination with methyl jasmonate, hydrogen peroxide and magnesium chloride for 168 hours. Stilbenoids were extracted from the culture medium and analyzed by high performance liquid chromatography (HPLC). Extracts from the combined elicitor treatment contained higher levels of stilbenoids. The antioxidant activity of the extracts was assessed with the 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay and by an on-line HPLC-DPPH method. Extracts produced from the combined elicitor treatment exhibited greater antioxidant activity than the extracts from the cyclodextrin treatment alone. Our studies suggest that the peanut hairy root extracts are a good source of antioxidant compounds that have potential use as nutraceuticals to improve human health.
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INVESTIGATION OF MOISTURE DAMAGE OF ASPHALT BIDDERS USING THE ATOMIC FORCE MICROSCOPY (AFM) TECHNIQUES

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Moisture damage due to stripping in asphalt concrete is one of the major concerns to the state Departments of Transportation (DOTs). The current moisture sensitivity tests methods are unable to describe the root cause of moisture damage phenomenon as they are based on the micro- and macro-level test results and focused on the qualitative measurements only. The main goal of this study is to quantify the moisture damage of the asphalt binders using an atomic force microscopy (AFM) tool. In this study, two performance grade (PG) base binders along with their modified counterparts using polyphosphoric acid (PPA), styrene-butadiene-styrene (SBS), and SBS plus PPA are evaluated in the laboratory. Based on the AFM test results, it is evident that surface morphology of the asphalt binders are significantly reformed or changed due to the effects of moisture damage. It is also found that base binder is the most susceptible due to moisture effects among all tested binders whereas SBS-modified binder provides sufficient resistance against the moisture-induced damage potentials. Findings of this study will help highway and transportation agencies to have a comprehensive understanding of moisture damage and take preventive measures in constructing the asphalt pavements.
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MODELING FOR MINERAL REDISTRIBUTION OF BLENDED COALS DURING PULVERIZED COAL COMBUSTION

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This paper presents a modeling study for predicting mineral redistribution of blended coal after combustion. The objective of this research was to develop a model to investigate the impact of excluded and included minerals on the mineral redistribution in terms of mineral composition and particle size. A total of seven single coals and five ash samples were collected from the baseline power plant and sent to a chemical lab to test proximate analysis, Malvern particle size distribution analysis, Computer Controlled Scanning Electron Microscopy analysis, and ash composition. Submodules of mineral redistribution modeling on single coals to be blended were built up based on the test data. Then the main module of mineral redistribution of blended coal was made by combining the single coal mineral redistribution submodules by the blending ratio. The modeling results were compared with the test results of ash samples collected from the baseline plant for validations and verifications and agreed within 14 percent discrepancy. It was found that the calculated mineral redistribution of larger included minerals resulted in the peak mass fraction in 10-46 μm since all included minerals in 46-100 μm were fragmented.
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ELECTROSTATIC STABILITY AND OPTICAL TUNABILITY OF CHARGED PARTICLES IN INVERTED SYSTEMS: AN APPROACH TOWARDS NOVEL TUNABLE SURFACES

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Non-uniform distribution of charged particles defies the fundamental tenet of Coulomb's law due to their nonlinear behavior towards a stable, non-touching equilibrium. A balance between electrostatic attraction and repulsion is created without the intervention of van der Waals attraction. Three charged particles were analytically considered in an inverted system in terms of electrical permittivity of background medium and charged particles. The magnitude and orientation of the forces demonstrates a specific stable equilibrium zone for the assembly. With an applied field, the assembly is repositioned to a stable condition, which is simulated with the consideration of modification of the assembly of a non-touching lattice. The positional tunability of the charged particles of three and two particle assemblies provides a path to tunable photonic structures. The results open up the possibility for developing novel mesoscale non-touching crystal lattices with tunable optical properties.
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EFFECTS OF FOAM ROLLING FOR DELAYED-ONSET MUSCLE SORENESS ON MILITARY PERFORMANCE AND PERCEIVED RECOVERY

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Foam rolling (FR) has been used as a recovery method after athletic performance (MacDonald, Button, Drinkwater, & Behm, 2014; Pearcy et al., 2015) but no study has examined the influence of FR in military population. The purpose of this study was to evaluate the effects of FR and passive recovery (PR) on symptoms of delayed-onset muscle soreness (DOMS) and military-based tasks (MBTs). Twenty male and female participants (18-30 years) completed a baseline session and two DOMS-inducing exercise protocols, each followed by either FR or PR. MBTs (stair climb, ammunition carry, cover-to-cover, and shuttle run) were performed 24 hours later. Rating of perceived exertion (RPE) and rating of muscle pain (RMP) were also measured. A repeated measure analysis of variance was used to compare MBTs times. Friedman and Wilcoxon matched-pairs signed-ranks tests analyzed perceptual variables. The time to complete the MBTs was lower for baseline and FR when compared to PR. Post-recovery RMP approached significance with FR being slightly lower than PR. FR can be a practical tool to relieve muscular soreness and enhance military-based performance. While military personnel train every day, the symptoms of DOMS can occur at any point, it is recommended that they FR after every training session.
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SCREENING FOR AND MANAGEMENT OF ADULT OBESITY

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Obesity is the most prevalent chronic disease affecting nearly 40 percent of all adults in the United States, yet this complex disease remains largely underdiagnosed and undertreated in most primary care settings. The United States Preventive Services Task Force recommends screening for and management of adult obesity. Adults with a body mass index of 30 or greater are to be offered or referred for obesity management which includes a multicomponent Intensive Behavior Therapy program. Based on these recommendations, an obesity questionnaire was developed to examine the weight management interest of obese adults in a primary care setting in eastern Arkansas. During a two-week period in February, 2019, a non-probability, consecutive sample of 75 patients with scheduled health care visit were recruited to complete the obesity questionnaire. Utilizing non-parametric techniques and correlational analysis, self-reported weight management needs were analyzed. Based on these results a weight management program will be developed to meet the specific needs of this population in order to improve health outcomes and reduce the burden of this disease.
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INSTRUMENTAL MUSIQUE CONCRÈTE: THE VIRTUE OF NUANCE IN THE SONIC EXPERIENCE

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Instrumental Musique Concrète is a genre of music involving the use of "noise" from acoustic instruments, with the purpose of expanding the expressive possibilities of music. This genre is informed by the "Musique Concrète" genre, where raw, recorded sounds are employed as the basis of a musical statement. Just as the goal of Musique Concrète is to focus on how arbitrary sounds may be perceived and analyzed as music, Instrumental Musique Concrète focuses on sounds that acoustic instruments already create when performing a traditional piece capitalizing primarily on melody and harmony. A leading composer of this genre, Helmut Lachenmann, achieves these sounds using "extended techniques"–methods of playing an instrument in ways that may be jarringly different from how the instrument is normally played to create expressive sounds and colors. Thus, timbre, impulse, and intensity become as important, or even more so, than pitch and rhythm in shaping the musical statement. The result from immersing in this genre is this increased focus toward often ignored nuances and details and how they shape our perception of music, thus giving us a new way to understand familiar music and revealing unique and imaginative paths that new music may explore.
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SEXUALITY AND IDENTITY AND THEIR RELATION TO BULLYING AND DISCONNECTION IN MIDDLE SCHOOL

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Development of sexuality and identity play important roles in the lives of developing adolescents. While the rise of discussions around sexuality and identity in general and particularly LGBTQ+ issues has started to occur in sexual education courses in middle school, acceptance rates for LGBTQ+ students are still uncommonly low in America. LGBTQ+ students report not feeling engaged or connected with their classmates, peers, and teachers. Sexuality, budding views of identity, and the experiences of middle school (academic life, bullying, and teacher/peer acceptance) are all challenges that middle school students may encounter. To understand better how sexuality and identity impact the lives of middle school-aged students, a survey of student sexuality, identity, school experiences, and home lives was conducted between September and November of 2018. Eight participants responded. Data analysis reveals that five out of eight students are prone to experience bullying and only 25 percent of students said that LGBTQ+ students were accepted at their school. This is proof that LGBTQ+ students experience significant distress in their academic lives. It was concluded that more studies and attention is necessary about awareness and acceptance for LGBTQ+ students in middle school.
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'PRETTY HURTS': HOW SOCIETAL VIEWS NEGATIVELY IMPACT WOMEN

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"Perfection is the disease of a nation." This is a lyric repeated in the chorus of Beyoncé's song Pretty Hurts and an illustration of the frequently held idea that in society women's sole purpose is to look "pretty and put together" at all times, rather than to express their intelligence and authentic emotions in everyday life. The purpose of this study is to textually analyze how institutionalized discrimination and control, the media, and the objectification of people, particularly women, can be observed through Beyoncé's song lyrics and video imagery. My primary findings suggest that the lyrics and video imagery that Pretty Hurts portrays will speak to the abundance of real-world, irrefutable examples of what women's gendered roles in society are defined as, and also frequently believed to be. This injustice must be recognized and addressed for what it is, an unrealistic ideal that sets the majority of the female population up for feelings of inadequacy in the shadow of an unattainable ideal that results in them shunning a part of who they are to fully become the "beauty queen" they are "supposed" to be.
Mentor: Sarah Mayberry Scott, sscott@AState.edu

THE ANALYZATION OF THE REPRESENTATION OF GENDERED TOPICS IN BROOKLYN 99

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This research will analyze the NBC sitcom Brooklyn 99 which revolves around the lives of the police officers at the 99th precinct of New York Police Department in Brooklyn, New York. The show is currently on its sixth season and has been awarded multiple Emmy and Golden Globe Awards. The show is extremely relevant to the current political climate and displays diverse characters who are not all white, straight and male. It effortlessly includes characters with various sexual preferences, genders, intersectional personalities, etc. The artifact is an example of how gendered topics can be appropriately represented in the mainstream media. The show breaks gender norms, reverses gender roles and displays political correctness. The concepts that will be used to analyze the content are "who is represented in media," "how people are represented," and the "two-culture approach." The research will analyze how Brooklyn 99, a pop culture artifact, addresses gender issues and why it is possible for the mainstream media to encourage feminism while engaging its audience. The research will be conducted through textual analysis. The research is ongoing and the findings will potentially display how the show deals with gender stereotypes and gender roles.
Mentor: Sarah Scott, sscott@AState.edu

SELF-DISCLOSURE IN PEER MENTORING AT THE COMMUNICATION CENTER AT ARKANSAS STATE UNIVERSITY

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This research examines self-disclosure in peer mentoring in the Communication Center at Arkansas State University. Clients are often nervous and anxious when they seek the assistance of the Communication Center. The examination of the relationship between the peer mentors and their clients with respect to self-disclosure can benefit future peer mentors in understanding the intricacies of self-disclosure and provide awareness on how to utilize it effectively. Additionally, the research will assist the Communication Center with creating in-depth training material regarding more efficient coaching sessions. The research will be conducted via the case study method. The case study will analyze the field notes submitted weekly of the Communication Coaches at the center and will discuss how self-disclosure is being utilized in coaching sessions. Moreover, the research will expand on the levels of self-disclosure that occur in the sessions and their topical diversity. The research is ongoing and thus the findings are not yet available to be shared.
Mentor: Sarah Scott, sscott@AState.edu

ANALYTICAL MODELING ON MULTIPHASE HEAT AND MASS TRANSFER IN FULL-SCALE GAS-TO-GAS HEATERS FOR ULTRA-SUPERCRITICAL PULVERIZED COAL-FIRED POWER PLANT APPLICATIONS

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An analytical modeling on multiphase heat and mass transfer in full-scale cross-flow staggered bare and spiral finned tube heat exchangers has been developed. The objective of this research was to predict the variables and performance parameters in the heat exchangers including the properties of flue gas and water, condensation rates of water and acid vapors, heat transfer rates, and effectiveness in the full-scale gas-to-gas cooler (GGC) and gas-to-gas heater (GGH) at transient mode by using the model. An 870 MW ultra-supercritical pulverized coal-fired power plant was chosen to be the baseline power plant for collecting the design and measured data. A straight-tube approach with the finite difference method and iterative solution technique was applied for solving the boundary value problem. For validations and verifications, the modeling results were compared with the measured data which showed ± 1 percent discrepancy in GGC. The impact of coal quality on the performance of GGC and GGH was investigated by conducting case studies with variations of coal blending. It was found that the calculated thermal performance in the heat exchangers was degraded up to 11 to 18 percent after running 3.3 years depending on the coal quality.
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WHEN WOMEN ARE POWER

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The 2008 novel, City of Thieves, by David Benioff is a brilliantly told coming-of-age story based in the time of World War II. The harrowing yarn tells of two young men, Lev and Koyla, on the search for a dozen eggs. Within the book there is a repeated theme of male dominance asserted by the degradation, manipulation, rape and objectification of women. Through a textual analysis of views of masculine styles, the rules of what makes a woman "attractive" and therefor worthy and using norms against each other I wish to display how women are used as power and how through repetition of behavior it becomes normalized.
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EFFECTS OF EXPERT AND CHARACTER WITNESS TESTIMONY ON JURY VERDICTS IN A MURDER TRIAL

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When a trial of law is being conducted, there are a multitude of factors that can either lead to a conviction of a guilty individual or lead to the dismissal of a case. The inclusion of both character and expert testimonies is a strategy used by attorneys in order to produce specific results. Previous research has indicated that both expert and character testimony have an effect on how view the defendant and in how jurors make a verdict, but we did not find any research comparing the two. In this study, we are observing the effect of different types of testimonies on jurors' decisions in a murder trial. Our approach includes an online survey containing a murder trial scenario followed by three types of testimonies: expert, character witness, and no witness. After reading the scenario and one type of testimony, participants will act as jurors and decide the verdict. This study would further the field by adding to the limited research on character witnesses and by deepening knowledge as to what types of testimonies best impact jurors decisions. We are currently in the process of collecting data for this project, so we have no findings at this time.
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"GIRLS NEED LOVE" SONG RELEASE CHALLENGES THE IDEAS OF GENDER COMMUNICATION

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In 2018, Summer Walker released the song "Girls Need Love" voicing open sexual desires. Walker altered thoughts of feminine gendered speech styles to be more unguarded. The song inspired Trevor Jackson to release a remix of the song, "Boys Need Love 2". Jackson's song overturns stereotypical closed emotional speech through the lens of masculinity. The purpose of this study is to examine the language used in pop culture through songs that challenge gendered communication stigmas. As a result of my research within the book Gender in Communication by Defranciso, Palczewski, and McGeough I observed a relationship between the ideas in the book and the songs. I found the songs to be controversial within a few areas described in the text. In this textual analysis, I will be discussing how these songs oppose gendered talking styles, participate in objectification, and defy the muted group theory. Additionally, I will explain how these songs challenge the ideas of communication between genders. This research is an effort to exemplify an artist within the music culture pushing against stereotypes of gender, which in turn can potentially impact the listeners' ideology of gender.
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THE POWER OF GENDER IN COSPLAY

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Sometimes becoming anyone else is the best way to discover your true self. Cosplay, the practice of dressing up as a character from a movie, book, or video game, is a fairly common hobby, and sometimes career, that offers those who practice it a direct connection to their inner selves. This inner self includes the true desires and emotions of a person that are often hidden by the mask that they wear when facing society. While cosplay has limitless potential when it comes to expression, it is not without its own faults. My goal is to bring light to three major issues in the world of cosplay: the negative impact of crossplay, or a costume made by a cosplayer that is the opposite gender of the characters intended gender, the power of cosplay on body types, and the increase of sexual harassment that has led to the creation of the number one rule of cosplay "cosplay is not consent". I will also discuss how the cosplay community views these issues, and what actions they are taking to help counteract them. My main goal is to bring to light the many issues of an expansive culture built upon self-expression.
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SEXUAL ASSAULT AN EPIDEMIC ON COLLEGE CAMPUS

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"When you do nothing, you're helping him. But when you do something, you're helping her." By silencing ourselves we allow for the silencing of victims; not coming forward when seeing someone in danger helps no one but the perpetrator. The problem: the bystander effect, a psychological phenomenon stating that people are less likely to offer help when others are present, is aiding and abetting predators and the ongoing effects of rape culture. The purpose of this critical essay is to bring awareness to language we allow men to use regarding sexual assault and how acting is an important role in combatting this violence. I will critically analyze the ad campaign, Who Will You Help? By Kathleen Wynn using three important concepts discussed in class: objectification of women, gendered communication in the workplace, and education as a gendered institution. Utilizing case studies, firsthand stories, and statistics from The Hunting Ground, I will dissect sexual assault at college/parties, the workplace, and education to aid in the understanding of the effects of sexual violence as seen in the ad. This study will allow others to understand how we have created a culture of sexual violence in all aspects of our lives. I expect to find that the bystander effect plays a large role in the normalization of rape culture by refusing to acknowledge it as a society.
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CONTROLLING MUSICAL EXPRESSION WITH HARMONIC STRUCTURES

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Crafting harmonic progression is a critical aspect of creating music that effectively communicates and projects varying degrees of human expression. It is the harmonic progression that forms the basis for the unfolding dynamics and drama of the musical narrative. This presentation will describe the process of composing a musical work that uses harmonic progression as the building block for an effective musical presentation. It will include a brief description of the artistic and poetic impulse, followed by the process of making effective choices of harmony as well as other factors that contribute to an effective musical presentation and support the poetic impulse. The concepts discussed will be illustrated by accompanying examples of original music.
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LESLEY GORE

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Lesley Gore is a legendary pop singer. Even though she may be most famous for giving women full permission to cry at their birthday parties with her classic hit "It's My Birthday," Gore left behind a remarkable legacy that stretches far beyond the timeless teen heartbreak tunes she is known for. Gore was a proud member of the LGBT movement, her songs represented female independence and strength that is celebrated around the world. Some would say the song "You Don't Own Me" was way before its time because of the monumental stuff it covered. The hit encouraged young women around the world to take control of their relationships and assert their independence. The 60's were full of segregation and inequality, white men were at the forefront leading the charge. This song challenges women to take action and stand up for what is right. Chapter five touches on the topic gendered/sexed language. Those who belong to dominant groups within a culture have more influences over language and hence, over the terms that form a culture's terministic screen. Muted Group theory explain why some people are unable to express themselves even when they have the physical ability. The theory highlights how dominant and non-dominant groups within a culture have different boundaries. Lesley Gore denounced this theory demanding that women take a stand.
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THE IMPACT OF PARENT PERCEPTIONS ON CHILD FUNDAMENTAL MOTOR SKILL

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Inactivity among children is a problem in America due to physical activity (PA) being necessary for cognitive development, stress relief and good health. Children with inactive parents are much less likely to be active than children of active parents. Less active children are unlikely to experience opportunities to build fundamental motor skills that will help them be active later in life. Since Arkansas is first in the nation for adult inactivity, it is important to examine how parental socialization of children impacts development of fundamental motor skills. Test for Gross Motor Development (TGMD-2) data were collected from 105 children (aged 3-5 years) to assess motor skill competence. Parent perceived physical literacy was collected with the Perceived Physical Literacy Instrument. Self-reported PA was collected with the International Physical Activity Questionnaire. Parent perceived skill competence of their child was collected through online survey questions created to be related to TGMD-2 test components. It is believed that active parents who perceive themselves to be competent, will think their kids active and competent. Multiple regression analysis will be used to examine the effects of parent perceived physical literacy, parent perceived competence of child, self-reported PA, and gender on child motor skill competence.
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THE BLACK PANTHER[ESS]

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Throughout the 2018 blockbuster film Black Panther, different types of gender roles are illustrated. The production displays multiple gender norms and stereotypes, but more importantly challenges them. In the film toxic masculinity is expressed through hyper masculinity by depicting aggression as a tool used to represent worth. The film challenges this stereotype displaying these men working showing empathy and existing in collaborative setting. Two characteristics that are seem as feminine in our society. Femininity is challenged throughout the production. Cultural ideas of attractiveness are reversed and the social norm of clothing trends are tarnished throughout, expressing femininity with a sexy new look. Gender performativity is challenged again with the role of women in the script. The stylized acts of women throughout the film are from the stereotypical gender norm, displaying women in cunning and powerful roles, breaking down social norms one character at a time. The production displays multiple gender roles, but more importantly challenges stereotypes and depicts that there are no restraints on who we are, despite our gender.
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Poster Presentations

A RURAL CLINIC'S PATIENT POPULATION ADHERENCE TO GOLD DIAGNOSTIC CRITERIA FOR USING PULMONARY FUNCTION TEST'S IN COPD

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Chronic Obstructive Pulmonary Disease (COPD) is a major issue worldwide. Globally, it is estimated that 3.17 million deaths were caused by the disease in 2015. In 2016, prevalence of 251 million cases of COPD were reported globally (WHO, 2017). Even though it is a global initiative guideline to use pulmonary lung function test's (PFT's) to diagnosis and manage treatment of COPD, a retrospective chart review conducted in 2015 in Switzerland showed that only 83 percent of patient's charts had documentation of PFT confirmation of COPD either at the time of diagnosis or during follow-up. The purpose of this study is to compare a rural Northeast Arkansas's population of patients 50-75, male and female's rate of PFT documentation compared to Switzerland's 83 percent. This study will be conducted using a retrospective chart review. This study will show that patients in a rural clinic in Paragould, Ark., have a lower percentage of documentation of PFT's due to limited access to care. These results can be used to raise awareness on limited access to care that hinders following a global initiative guideline. Results are pending at this time.
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LASER COMMUNICATION SYSTEM

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This laser communication system transmits sound or music signals through a laser beam. Using this laser transmitter and receiver circuit you can communicate with your neighbors wirelessly. Instead of RF signals, light from a laser torch is used as a signal carrier in the circuit. A laser torch can transmit light up to a distance of 500 meters. The intensity of the laser beam changes with the amplitude of the sound signal. The variation in the intensity of the laser beam is converted into a variation in the voltage level by using a calculator's solar panel. The voltage variation on the solar panel is amplified by a low voltage power amplifier LM 386 and reproduced using a speaker. Laser-based communication link allows the people at a distance of around 500 meters or more to communicate wirelessly through a laser. Nowadays the current most used high speed technologies are fiber optics and microwave, but disadvantage of that is the cost of installation and maintenance, and it cannot be used in satellite links. In the other hand laser communication is low cost and can be applicable where fiber optics is impractical to use. The current applications is defense and sensitive areas, at airports for communication across the runways, NASA- satellite – satellite communication and Earth – satellite communication. Laser communication is more secure and provides high bandwidth requirements which's narrower than microwave antennas. The low power consumption is also a great advantage. It can be the mostly used technique worldwide in near future.
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HUMAN POWER VEHICLE

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The American Society of Mechanical Engineers (ASME), a professional nonprofit organization, founded as an engineering society to provide training and education of mechanical engineering in North America. However, ASME has more than 130,000 members in over 150 countries. ASME is one of the oldest standards developers in the United States, and produces roughly about 600 codes and standards covering five core technologies, which are manufacturing, pressure technology, clean energy, bioengineering and robotics. ASME's objectives is that engineering students learn how to grow and strengthen their section by working with other students and early career engineers. They also identify how the students can work with people as early career engineers. The Human Powered Vehicle Challenge (HPVC) is a project, has been held annually for 30 years in the United States by ASME. The last notable participation of Arkansas State University in the ASME HPVC was at the 2009 HPVC East, which was held in Philadelphia, Pa., April 18. Arkansas State University placed sixth for the single rider speed challenge. The group was assigned to the HPVC to compete with other teams for designing and building a vehicle which could become alternative transportation tools for people all over the world.
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STEEL RECYCLING SIMULATION

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Recycling scrap metals reduces carbon emissions and conserves energy compared to making it from virgin ore. Steel is a valuable metal that can be recycled numerous times without affecting its properties. The advantages of recycling steel are that it is cost effective and environmentally friendly. When recycled steel is used to make a new product, natural resources and energy are conserved. This is due to recycled steel being refined and processed already. Forming steel the second time is much cleaner and less energy-intensive than the first time. Many models and simulations were created to help better understand the process and improve it. Simulation of a real life process have the benefits of saving money by cutting the cost of buying the actual tools and machines and risking damaging them .This project is to simulate a fully automatized steel recycling process starting from shredding the scrap metal until the final product of clean cut steel bars; with all the processes of melting, compressing, cooling, grinding and cutting in-between. Using programmable logical controllers (PLC) to control each component of the process and getting feedback to check the quality and function of each step of it.
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MONITORING WATER QUALITY IN EIGHT SUBWATERSHEDS OF THE STRAWBERRY RIVER, ARKANSAS

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The Strawberry River is a tributary of the Black River within the White River basin in northern Arkansas. The river distance from source to mouth is about 177 km, and it is considered by the ADEQ as an extraordinary resource and ecologically sensitive waterway. In order to protect the water quality, it is important to determine which tributary is adding to the impairment due to siltation. Water quality in eight tributaries, from October 2016 to October 2018, was collected prior to the confluence with the Strawberry River. Water quality variables included total suspended solids (TSS), turbidity, pH, conductivity, dissolved oxygen, PO4, TN TP, NO2, and NO3. Site location seemed to influence the turbidity and TSS significantly. Upstream sites had lower turbidity and TSS values than downstream sites as it transitions from the Ozark Highlands to the Delta Ecoregion. The major cause of the impairment is thought to be from excessive sedimentation due to agriculture runoff. This project will help us to monitor the water quality of this extraordinary resource, protecting over 100 species of fish and other indigenous species as they are being threatened by agriculture runoff.
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ADHERENCE IS KEY: IMPROVING HYPERTENSION CONTROL THROUGH EDUCATION

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Hypertension is one of the most common diseases in the United States, often leading to heart attack and stroke. However, the disease often does not cause any symptoms, and therefore it is not properly managed in many cases. Many patients with hypertension may not know they have the disease or may not strictly follow any prescribed treatment regimen due to not understanding the serious nature of the disease or some of the potential complications. Still many are not aware how diet and lifestyle changes can improve disease control. An educational presentation was done for some members of a local community church regarding hypertension, the DASH diet, and how it can help maintain better cardiovascular health, specifically with regards to hypertension. A survey was taken of the participants before the presentation to assess general knowledge, then the same survey was taken after the presentation to assess whether learning had occurred. The number of positive responses after the presentation compared to those before the presentation indicated knowledge gained by the participants with regards to hypertension and its relationship to diet and lifestyle. This indicates that patient education can be effective and should be implemented where appropriate.
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EVALUATING NUTRIENT AND SEDIMENT CONTRIBUTIONS TO THE AGRICULTURALLY DOMINATED UPPER CACHE RIVER WATERSHED, ARKANSAS

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Nearly 50 percent of all assessed streams in the United States are impaired for not meeting their designated use, with the leading cause of impairment listed as agriculture. Agricultural lands tend to have altered stream channels and serve as one of the largest sources of nitrogen and phosphorus pollution into streams, reducing water quality and negatively impacting aquatic biota. In the Cache River Watershed, approximately 70 percent of the 230-km-long watershed is used for agricultural purposes with over 200 river-km listed as impaired for not supporting aquatic life due to sedimentation. The goal of the project is to monitor sediment and nutrient contributions and water quality of the Cache River Watershed. Turbidity, total suspended solids (TSS), and total phosphorus and nitrogen were analyzed weekly from October 2017 to October 2018, in 12 tributaries of the upper Cache River Watershed. When grouped by agricultural intensity, there is seasonal variation in nutrients present and a significant difference in turbidity between low and moderate or high intensities. These results suggest that the agricultural intensity plays an important role in the amount of sediment and nutrients to the Cache River, which may be contributing to nutrient and sediment levels of the Mississippi River and ultimately the Gulf of Mexico.
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MOLECULAR CLONING FOR EXPRESSING HUMAN FIBROBLAST GROWTH FACTOR-2 IN TOBACCO BY-2 CELLS

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Cellulose is a major structural component in plant cell walls and is under investigation for tissue engineering and drug delivery applications due to its structural properties. Thousands of reconstructive surgeries are performed daily; there is a demand for high quality scaffolds to repair or replace tissues damaged due to trauma. The goal of this project is to create transgenic tobacco BY-2 cells that can be devitalized to use as plant cell-derived matrices for sustained-release drug delivery in mammalian cell cultures and tissue engineering. Specifically, my project established a BY-2 cell line expressing recombinant human fibroblast growth factor-2 (rhFGF-2). This protein possesses broad mitogenic and angiogenic activities and is involved in tissue repair. The combination of plant cell-derived matrices with functional proteins incorporated in them offers a promising new approach for regenerative medicine and tissue engineering needs. As a junior fellow in the Bearcats in Biotech program, I learned and implemented standard molecular cloning techniques to construct a plant expression vector used for BY-2 cell transformation. Essential biotechnology and biomedical techniques now in my "molecular toolbox" include: PCR, DNA gel electrophoresis, DNA extraction, bacterial transformations, SDS-PAGE, and Western blotting. Research is ongoing and the findings will be presented upon its completion.
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CHLAMYDIA REASSESSMENT RATES AFTER DIAGNOSIS IN CENTRAL ARKANSAS

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Chlamydia is the most common and most often reported sexually transmitted infection. This infection can affect any sexually active male or female, no matter the age group. Chlamydia leads to other complications such as pelvic inflammatory disease, infertility, and others if left untreated. The purpose of this quality improvement project was to determine the number of chlamydia-positive patients that are scheduled for a follow-up appointment after diagnosis and treatment. Because of the vagueness of the symptoms (if any), it is very common to get infected with chlamydia again after treatment. All positive patients should be retested within 3 months, even if the patient and the partner are both treated. Patient charts were accessed utilizing a retrospective chart review at a primary care clinic in central Arkansas. Of the 40 patients diagnosed with chlamydia, only 16 of them were scheduled for follow-up screening according to guidelines. The analysis will help decide if providers are adhering to Center for Disease Control guidelines by scheduling all chlamydia-positive patients for a 3-month follow-up screening after treatment is initiated. This study is important because it can potentially decrease the complications that could occur if patients are not treated efficiently or if patients become re-infected.
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RETHINKING SIN: ASSESSING THE STRUCTURE AND CONTENT OF THE SEVEN SINS INVENTORY

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Within Christianity, teachings advocate against temptations known as the seven deadly sins (e.g., wrath); no prior research studied every sin together, so Curtis, Hatvany, and Burkley (2018) developed the 49-item Seven Sins Inventory (SSI). Because the properties of a scale and its subscales (i.e., factors) should be validated, the present research assessed the structure and content of the SSI's seven-factor model. Data was collected from 214 introductory psychology students (68.70 percent female), who responded to the SSI and other sin-related survey items. A confirmatory factor analysis (CFA) of the data indicated the seven-factor model was a poor fit, CFI = .84, suggesting the survey items of the SSI do not reflect seven sins. Item analyses and multivariate statistics revealed 14 items that warranted removal, including all items about pride. Another CFA found a 35-item, six-factor model showed an acceptable fit, CFI = .90. The remaining six sins were highly reliable (= .86-.93) and correlated with other sin-related survey items (e.g., between SSI-Lust and sexual compulsivity; r = .57, p < .001). Therefore, instead of seven sins, the present scale may be better conceptualized as a Six Sins Inventory. Future research should further investigate the properties of the suggested 35-item version.
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REVISITING MICROBIAL RESISTANCE TO BLUE LIGHT THERAPY

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The purpose of this study was to determine if Staphylococcus aureus is capable of developing a resistance to 464 nm of light if repeated exposures to subsequent generations is employed. Research on this point is equivocal. Our lab was one of the early producers of suggestive data supporting potential for resistance development. Others have not found similar outcomes. Little research has attempted to explain the possibility and mechanism of this phenomenon, therefore creating a gap in knowledge in this area of phototherapy research. After culturing colonies of Staphylococcus aureus, the colonies were treated with 464-nm blue light at a fluence of 150 J/cm2. Seven generations of the organism were serially exposed to lethal doses of the light energy. While some loss of treatment effectiveness was seen in later stages of the experiment, no sustained loss of effectiveness was demonstrated. Results of this study were similar to a previous study performed in this lab. Despite the significant difference in kill rate at specific later stages, we determined that true resistance development is not likely.
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THE FORCES OF CONNECTED LEARNING AND UNIT DEVELOPMENT FOR MIDDLE SCHOOL

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When designing an eighth grade unit about Force and Interactions, the presenter integrated to ensure a Connected Learning approach to develop a networked, peer-supported ecology for learning. This research displays a unit framework and three central lesson plans that feature networked, student-led learning events. Using the backward design unit creation method, long-term transfer goals, big ideas, and essential questions are considered with the end in mind. The unit follows the Connected Learning principles that "allow every young person to experience learning that is social, participatory, interest-driven, and relevant to the opportunities of our time" (NWP & MacArthur Foundation, n.d.). The Connected Learning principles are: interest-powered, production centered, peer-supported, shared purpose, academically oriented, and openly-networked learning and are described in the unit ecology (learning environment). Communication to parents about the unit and summative assessment requirements also play an important role in the overall design. Peer assessment and other relevant kinds of formative assessment are included to ensure learner reflection and effective feedback to the teacher for instructional decision-making. Outcomes include the reflections from a preservice teacher about becoming a curriculum designer and about how Connected Learning influenced her processes and decision-making about unit development.
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ADULT ILLITERACY EPIDEMIC

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Adult illiteracy is an epidemic that plagues upwards of 44 million people over the age of 15. These adults either read at a basic level or a below basic level. One way to help minimize the damage done by a poor reading education is to introduce vocabulary techniques that raise the level of reading for those involved. Introducing vocabulary techniques to both young readers and older readers is an effective way to combat the cycle of inadequacies of education between parents, their kids, and the school system. The study will hopefully find that adults who did not have an adequate reading education growing up will know that their lives could and can be different if they choose to eliminate their reading deficit. This work is important as it can open up techniques and methods that will hopefully help to introduce new ways to combat adult illiteracy, either by directly facing the problem or by starting at a lower level and breaking the cycle of reading deficits within school age readers.
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A WEST MEMPHIS CLINIC'S ADHERENCE TO JNC 8 GUIDELINES FOR AFRICAN AMERICAN PATIENTS

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Hypertension contributes to 1,100 deaths per day and costs the US $48.6 billion in lost time at work, healthcare dollars, and medications. New guidelines for the management of hypertension (HTN) were released in 2014 by the Eighth Joint National Committee (JNC 8). The JNC 8 guidelines recommended blood pressure control levels for patients and medications based on patient's age, ethnicity, and comorbidities. The purpose of this project was to determine adherence to JNC 8 guidelines regarding African American (AA) patients age 40 to 60 in a local West Memphis, Ark. primary care clinic. The research study was conducted using a retrospective chart review to determine the first-line medication prescribed by the provider in her AA patients with a diagnosis of primary hypertension. The study found evidence based guidelines were followed in 70 percent of patients studied. These findings will be shared with the provider to supply a catalyst for an upcoming quality improvement plan. Increasing awareness of JNC 8 guideline adherence has the potential to improve guideline adherence. Research has demonstrated guideline adherence will lead to improved blood pressure control in AA patients which will decrease the likelihood of developing comorbidities.
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SOYBEAN ANDROGENESIS FROM FLOATING ANTHER CULTURE

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Our continued work will provide information on how to facilitate development of new soybean varieties through androgenesis. The goal of the floating anther approach is to promote dehisce in culture, releasing microspores into the medium. Donor plants were temperature shocked, floral buds were surface sterilized, and anthers were excised following established protocols. Anthers were floated on liquid culture media varying in osmoticum (12 percent vs. 2 percent sucrose) and pH treatments (pH 5.8, 7.0, 9.0) to enhance anther dehiscence. Across repeated experiments, treatment variables did not have a consistent or significant effect on anther dehiscence; rather, dehiscence appeared to be more related to stage of anther development when placed into culture. Using high concentrations of auxin, one experiment produced embryogenic calli but were likely of somatic rather than gametic origin. We continue to compare the isolated microspore and floating anther approaches, by testing variables between the two to maximize time efficiency and gain ground on each project. With world population expected to increase to over 10 billion by 2050, a higher need for food production on limited arable land is inevitable. Isolated microspore cultures exhibit sustained cell divisions and embryo formation, and the floating anther system should be capable of those outcomes.
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LEMON CHIA SEED COOKIES

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In this study, I will be testing the differences in taste of lemon chia seed cookies made with all-purpose flour and coconut flour. All-purpose flour is used in most baked recipes. Coconut flour is rarely used in baked recipes however, it could be a good gluten-free alternative. We are interested to see how each of the flours pairs with the chia seeds, originated from Central America. This study will show which flour is preferred. There will be a panel of different evaluators, including students and graduate assistants, testing my product using a hedonic scale ranging from 1-5, five being the excellent. Based on the feedback, I will modify my product to market it in the best light with the best recipe.
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THE RELATIONSHIP BETWEEN CHRONIC LOW BACK PAIN AND INSPIRATORY ABILITY

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Low Back Pain (LBP) is the number one cause of disability in the world, and the cause of approximately 85 percent of LBP cases cannot be accurately identified by common imaging procedures. These poorly classified cases of LBP are called non-specific LBP (NSLBP). Considerable effort has been expended to classify NSLBP (e.g. muscular, articular, neurogenic, degenerative, and psychosocial); however, further stratification remains necessary to properly diagnose these patients. The functional status of various abdominal muscle groups has been linked to NSLBP, but little research has been conducted to study the role of the diaphragm in NSLBP. We will use maximal inspiratory pressure (MIP) to indirectly measure diaphragmatic function and ultrasound imaging to assess diaphragm excursion and thickness. We will then compare these data with findings of patient reported functional status using the Oswestry and STarT Back Tool. We will attempt to determine whether there is a relationship between diaphragmatic function and functional status in subjects with NSLBP. We hypothesize that MIP, along with diaphragmatic thickness and excursion will be decreased in individuals with NSLBP. If this hypothesis is supported, such understanding should support further research into the use of MIP as a predictive value for NSLBP.
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PROTECTION AGAINST INFLUENZA WITH APPROPRIATE IMMUNIZATION

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The Center for Disease Control and Prevention determined that in the United States between 2016-2017, an estimated 600,000 people were hospitalized from influenza, yet the influenza vaccine prevented an estimated 5.29 million illnesses. Intramuscular injection and inhalants are two of the developed options for vaccinations that research has proven to be effective. Flu vaccination coverage among adults remains low with only about 4-in-10 adults reporting receipt of a flu vaccination over the past eight flu seasons. The purpose of this study is to compare the vaccination rate of all adult patients ages 18-73 years that became infected with influenza to the national average of 37 percent. Data was obtained in a retrospective chart review conducted between Sept. 1, 2018 until Feb. 29, 2019 in a primary care clinic in Eastern Arkansas. Results show that patients diagnosed with influenza did not receive their flu shot and those that did receive the vaccine were less likely to be diagnosed with the virus. This research shows that receiving the influenza vaccine is the most effective way to prevent infection.
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INCREASING WRITING ACHIEVEMENT THROUGH EVALUATION CRITERIA INSTRUCTION

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Without consistent instruction, as well as a competency of the expected product, students in the United States are failing to meet proficiency levels in writing. The purpose of this research is to determine if students would benefit from consistent, process-oriented writing instruction that explicitly teaches the evaluation criteria through the use of a scoring rubric. The epistemological perspective is a group-based objectivism theory approach allowing students to work together to accurately apply the knowledge of the evaluation criteria when using a scoring rubric. This study will evaluate writing improvement of students in two second grade classrooms. Quantitative data will be collected following a pre and a post-personal narrative writing assessment. Students will self-assess their writing prior to the classroom teachers assessing the writing. Data will be analyzed to determine if the students in the focus group demonstrated writing improvement and if they are better able to assess their own writing following explicit instruction and practice with the scoring rubric. The anticipated findings of this study are that it is beneficial for teachers to explicitly teach students the writing evaluation criteria using a rubric, as well as, analyze writing samples to help them understand and internalize the scoring criteria.
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DNA ENTRAPMENT USING LIGHT-MATTER INTERACTION IN NANO-PATTERNED ARRAYS

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The fabrication of nanoparticle patterns has many applications in electro-optic and biotechnology areas. There are many lithography methods for developing nano-patterns, however, these methods are neither time nor cost-effective. As an alternative approach, solid-state dewetting has been developed using heat radiation and surface tension force on a deposited thin-film. The main objective in this research is to fabricate metal nano-islands and manipulate them to trap DNA samples to identify its species. Particularly, the interaction of DNA with gold and silver nano-patterned arrays were studied. DNA has its own structural electric field and it influences the nanostructures' electric fields which are generated under certain ranges of wavelengths of light. Through the UV-VIS spectroscopy analysis, we found that single-strand DNA was favored to react with the fabricated nano-patterns, however, double-stranded was not. An electro-magnetic (EM) simulation also confirmed the generation of the electric field between the nanoparticles within the specific range of wavelength of light. Additionally, a new idea to improve the uniformity of nanopatterns and resulting selectivity of DNA samples is presented.
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CORRELATING WATER QUALITY DATA TO FECAL COLIFORM COUNTS

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Pollution of streams and rivers in the United States is damaging the environment and risking the health of humans in recreational areas. Fecal coliform bacteria are an indicator bacteria for dangerous diseases such as Escherichia Coli, hepatitis and salmonella. The most common way to contract these diseases via polluted water is by oral ingestion or through breaks in the skin. Assessing and correlating water quality to fecal coliform bacteria can pinpoint locations where humans are at risk for contracting harmful diseases. Fifteen tributary sites of the White River in Arkansas were tested twice a month to assess water quality parameters such as temperature, pH, dissolved oxygen, conductivity, turbidity, total suspended solids, total nitrogen, total phosphorus, and fecal coliform bacteria. Statistical analysis was performed to determine the correlation between water quality parameters and aqueous fecal coliform counts. Turbidity and total suspended solids had a strong positive correlation to fecal coliform counts. This shows that fecal coliform counts increase during high runoff and flooding events, which could increase the risk to human health in impacted recreational areas. This research project is ongoing and results so far are preliminary and subject to change with more data.
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INFLUENZA RISK INVOLVING COPD AND ADHERENCE TO GOLD GUIDELINES

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Chronic obstructive pulmonary disease (COPD) is a chronic disease in humans that is characterized by destruction of the alveoli and inflammation of the major airway. In addition, COPD is characterized by frequent episodes of worsening status known as exacerbations. The major causes of exacerbations include viral, bacterial and environmental involvement. This disease is prevalent in the United States and it continues to place a huge burden on our healthcare system. In 2017, hospitalization costs due to influenza reached an average of $14,612 per patient. That same year approximately 12,000 Americans aged 65 or older died from influenza. One affordable method to reduce rates of influenza burden is to provide an annual influenza vaccination, according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD). A retrospective chart review involving 60 patients included individuals who were 65 or older and had a diagnosis of COPD at a local clinic and compared to national averages. Data is divided by gender, age, race and influenza vaccination status. Results reveal lower rates of compliance which shows a need for nursing to educate about vaccines.
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READ-ALOUDS: LOST IN THE ERA OF ACCOUNTABILITY

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Most state departments measure the success of a school by student growth in content knowledge based on performance on statewide assessment. In Arkansas, one piece of the accountability formula is percentage of students reading at grade. In a Nation of Readers Report (1985), a relationship exists between students being read to and independent reading practices. According to Maloch and Beutel (2010), interactive read-alouds is an instructional strategy for teachers and students to discuss their understanding and response to texts. The purpose of this action research report is to examine the effects of interactive read-alouds on grade level reading for students in third, fourth, fifth, and sixth grade as measured by performance on the summative ACT Aspire exam. Through observation and data collection of teaching practices surrounding interactive read-alouds and weekly evaluation of student comprehension skills, results are anticipated to show an increase in percentage of students reading at grade level on the state assessment which utilize interactive read-alouds. Results from this action research plan are able to help educators decide on steps schools can take to improve or maintain accountability status. Students in engaging environments will learn and grow; achievement will be demonstrated on accountability measures.
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SAE BAJA DRIVETRAIN

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In the Baja race car competition, the biggest design challenge is maintaining high drivetrain performance since the engine used is the same among all racers (Briggs and Stratton 10HP Model 20). For the car to travel at functional and safe speeds, certain gear reductions need to be incorporated at different times. A-State has selected a continuously variable transmission (CVT), which allows for automatic transition between high speed and high torque. CVTs use a spring force to allow for a more variable gear ratio and smoother transition, as against shifting gears based on RPM. The transaxle is another important system that transfers usable engine power to the tires. As a single piece unit, it serves as the gearbox – set of spur gears that transitions from forward, neutral, and reverse – and the differential – a mesh of beveled gears that allow different rotational movement between the two rear tires. The transaxle also has a constant built-in gear reduction. The SAE Baja competition includes two events that tests the range of performance for each vehicle: the hill-climb and the four-hour stamina race. With this design, A-State's vehicle can reach speeds up to 38 mph on flat land and traverse a 40 degree incline.
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SAE BAJA SUSPENSION

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Every year, hundreds of universities from across the globe compete in the Society of Automotive Engineers (SAE) Baja race car competition. The competition requires engineering students to design, manufacture, test, and race a single seat off-road vehicle. One of the most vital aspects of the Baja design is the suspension system. This, along with the steering, is responsible for ensuring that the Baja can maneuver rough terrain and around obstacles. The steering and suspension systems must be durable and provide a high level of control. The geometries of the systems dictate the efficiency of the design. A-State's Baja team members will complete a mathematical analysis of the geometries of the systems as well as develop a model of the system in SolidWorks. For this, a Lotus suspension software was utilized to model and design the dynamic response of the control arms and shock spring rates. Once fabrication is complete, the vehicle will be put through rigorous testing to ensure its capabilities. This year's vehicle has an improved wheel travel and motion ratio compared to last year's model. This will bode well for A-State as they compete in the suspension and stamina race at the SAE Baja competition in Tennessee.
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AUTOMATED MATERIAL TRANSPORT SYSTEM

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As manufacturing and selling of goods continues to increase, material transport systems must continue to develop and meet the needs of warehouses and distribution centers. There has become a need for more automation within the transportation of goods to increase the rate of e-commerce product flow. The team has partnered with Hytrol Conveyor Company in order to research and develop an automated material transport system. This system incorporates an integrally controlled base, scissor lift, and powered conveyor, which was donated to the team by Hytrol. Its universal design allows the system to be utilized to lift, lower, receive and transport various loads so that it may be used in unlimited applications. The device reduces human workload and error. It is able to lift and move loads that are too heavy for a human to control. The automated material transport system is a great addition to any warehouse setting, and may be used in other extended uses such as airport luggage transportation and the like.
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LOWER BODY POWERED EXOSKELETON

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Injuries, genetic disorders, and disease have the potential to leave a person immobile. Moreover, these conditions can drastically change a person's life, taking away not only mobility but a way of life. In today's world, however, sufficient technology exists to help counteract these circumstances. Recent innovation in technology such as actuators, sensors, and computer processors have provided the ability to create new medical equipment which can alleviate a patient's symptoms and daily struggles by improving his/her motor function. The team researched and developed a device to restore walking mobility to persons affected by the aforementioned conditions. It incorporated joints and links which provide support and transmit torque to human joints. While similar products have been released, the team's device is cheaper and more efficient than those currently on the market. The group not only fabricated two working leg braces but also a walker that houses the power supplies and electronics, making it easier for the user to move with the device
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POPPIN' PILLS: MEDICATION MISUSE IN STUDENTS

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Every day young adults have more of a risk dying from prescription and over the counter drugs than getting into a car accident. Teens today are able to use an array of readily accessible OTC drugs to achieve a euphoric high mental state, while under the impression that they have no dangerous or damaging side effects. The reason that these drugs are such a problem in America is due to the fact that they are not monitored strongly enough, they can even be purchased by relatively anyone, and are available at the convenience of many. This issue is causing complications for teens across America and needs to be taken seriously due to the fact that in 2017, 602,000 teens reported they had used DXM to get high (NSDUH, 2017). Although there is scientific research showcasing how prevalent the misuse of OTC drugs is, the goal of our research is to bring it to the attention of parents so that they may be able to intervene before their children suffer damaging side effects.
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BRIDGE STRUCTURE STATIC AND VIBRATION ANALYSIS

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The premise of this project surrounds the study and evaluation of a small scale bridge assembly. The purpose was to observe the response of a bridge structure to static loading and unloading, as well as free vibrations. A 3D model of the bridge was modeled in SolidWorks in order to run a static analysis on the design which gave an accurate estimation of what was to be expected in the experiment. The static portion was performed by adding masses to the end of the structure and then measurements were taken of strain and displacement. The data showed a linear relationship between the amount of weight added and the strain and displacement. Vibration is the most important property when building a bridge. The vibration of a bridge is considered as a second order system. When the force in a second order equation is equal to zero then the vibration is considered to be a free vibration which means the object will vibrate continuously all the time with same amplitude. The free vibration portion of the project was done by striking the structure with a rubber mallet to identify and observe the bridge's natural frequencies. From the data provided below, it can be concluded that the structure's natural frequencies are located at 50Hz, 80Hz, 175Hz, and 250Hz.
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CASE STUDY: RADIATION THERAPY'S ROLE IN THE TREATMENT OF PEDIATRIC OSTEOSARCOMA

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Osteosarcoma is the most common type of bone cancer in children and teens. It affects about 400 children and teens in the United States each year. The primary treatment for osteosarcoma is surgery and chemotherapy. Radiation does not play a primary role for this malignancy, primarily because osteosarcoma is radioresistant. Surgery is used to remove the tumor and chemotherapy is used to treat as well as prevent the return of cancer. Radiation therapy has however, been shown to be useful in the treatment of metastatic osteosarcoma to reduce pain and provide palliative care. A case study of a 13-year-old girl from Venezuela will be presented. She was diagnosed with metastatic telangiectasia osteosarcoma and treated with radiation therapy for palliative care. Her radiation therapy treatment consisted of external beam IMRT and was administered at St. Jude Children's Research Hospital. The patient was unable to walk and move herself at the beginning of treatment and was in less pain and ambulatory upon completion of radiation therapy.
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FRIEND OR PHONE? MINDFULNESS AND PHUBBING IN COLLEGE STUDENTS

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"Phubbing" is a new, yet widespread phenomenon observed in numerous social settings (Chotpitayasunondh, & Douglas, 2016). Being mindful is quite the opposite; meaning one is consciously engaged in the current interaction or task. Goals of the study were to determine the commonality of phubbing and mindfulness and the relationship between the two. We hypothesized a negative correlation between the terms would be found, as well as a high level of phubbing. Participants were 324 Arkansas State University students. They responded to an online survey including a 24-item questionnaire measuring overall mindfulness as well as its five facets (Brown, & Ryan, 2003). Phubbing was measured by a questionnaire based on a scale by Chotpitayasunondh and Douglas (2016) and modified by us. Both scales used a Likert scale from 1 to 5 (1= never and 5 = very often). A negative correlation between mindfulness and phubbing ($r = -0.14$, $p < 0.01$). Overall average mindfulness was 3.19 (SD= 0.72). Average phubbing was lower than expected (M=2.34, SD= 1.00). Our findings indicate that mindless cell phone use can be reduced by providing students with practical ways of practicing mindfulness.
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ASSESSING THE BIODIVERSITY OF AQUATIC MACROINVERTEBRATE ASSEMBLAGES IN NORTHEAST ARKANSAS AGRICULTURAL DITCHES

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Runoff from farmland collects in agricultural ditches and often contains contaminants that negatively affect water quality and the aquatic life therein. These ditches are historically understudied, but can support a wide variety of both flora and fauna. Aquatic macroinvertebrates are one such group that have a wide range of sensitivities to pollutants making them good indicators of water quality and ecosystem health. The purpose of this study is to quantify macroinvertebrate diversity in two agricultural ditch systems in Northeast Arkansas to assess water quality. Methods based on the US EPA Rapid Bioassessment Protocols and published studies were used to collect macroinvertebrates from six sites in two watersheds in April and September 2018. Organisms were preserved in 70 percent ethanol and transported to the Ecotoxicology Research Facility at Arkansas State University for identification using insect keys, and additional literature for non-insect taxa. Using multiple diversity indices, these ditches were assessed to have overall poor water quality and no significant difference between watersheds, although slight improvements in abundance and species richness were measure between seasonal surveys. Although indices indicated poor water quality, relatively high species richness and abundance suggest agricultural ditches could be more ecological important than commonly thought.
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HELPING THE HERPS: RESTORING THE PAST FOR ARKANSAS STATE'S FUTURE

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The Arkansas State University Herpetological Collection dates back almost ninety years and contains approximately 34,000 specimens. It should be an accessible tool for anyone and everyone interested in the world of herpetology. However, the collection suffered from a lapse in proper curation and many specimens were stored in seemingly random order in leaky jars and stale alcohol and kept in an unsanitary environment. To overcome these obstacles, students and faculty members have composed a plan to address these issues and prepare the collection to reach peak performance. The team will transfer specimens to new jars and ethanol to prevent ethanol loss and eventual desiccation. Later phases will organize the jars by phylogenetic relation and establish a system that quickly checks specimens in and out of the collection. In the past year, these efforts have already brought the area out of its severe disarray, cleared the space's unsafe conditions, installed new shelving, and replaced many jars. At its full potential, this collection has the capability to bolster research and educational endeavors both on-site and beyond the university. It will undoubtedly provide questions, answers, insight, and inspiration to generations of students to come.
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PRACTICALITY OF THE FUNCTIONAL MOVEMENT SYSTEM IN THE GENERAL POPULATION

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The primary purpose of this review was to examine the efficacy of using the Functional Movement Screen (FMS) in healthy, non-athlete populations. The FMS is a pre-participation screen consisting of seven movements that allows practitioners to score movement quality, predict balance, identify compensatory movement patterns, and determine what leads to musculoskeletal injury risk (Cook et al., 2014; Scudamore et al., 2019; Kraus et al., 2014).The FMS has been extensively researched in athletes, leaving questions as to its use for non-athlete populations. To learn more about this, articles published after 2010 that investigated the use of the FMS to predict injury, or injury related variables, in the general population were included in this review. Investigations using professional or collegiate l athletes were excluded review. Reviewing the literature provided evidence that the FMS may be a viable screening method in this population, although some modifications may improve the screen. Modifications may include adjusting the scoring system and eliminating cross-body movements, as they are difficult for non-athletes to perform. Although more research is needed for deeper understanding, conclusions from this review are suggestive towards the inclusion of the FMS in healthy adult non-athlete populations prior to beginning sport or exercise regimens.
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A NEW KJELDAHL DIGESTION TECHNIQUE FOR ANALYZING TOTAL NITROGEN IN PLANT, SOIL, AND WATER SAMPLES

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Nitrogen (N) is a major nutrient for maximum crop yield. Nitrogen is a crucial constituent of plant organic molecules such as amino acids, nucleic acids, and chlorophyll along with inorganic molecules like nitrates and nitrites. Since nitrogen plays an integral role in plant growth, it is important to have a reliable methodology for testing total nitrogen content. Traditional Kjeldahl analysis of total nitrogen content involves the use of toxic mercuric oxide and a tedious acid titration to complete the analysis. A new technique that uses inert chemicals such as copper sulfate and titanium oxide coupled with colorimetric assay was evaluated to validate the accuracy and precision for the quantification of total N in plant, soil, and water samples. Assay tests were conducted in aqueous samples with N levels ranging from 2.5 ppm to 20 ppm for 60 replications. Digestion time was also tested for fasted reaction time. For water samples, NH_4^+ recoveries ranged from 85 percent to 95 percent with standard deviation between 0.3 and 0.9. Results show that with 1.25 hours of digestion time N can be accurately quantified, including trace amounts. The new digestion method is highly suitable for samples with large amounts of organic or inorganic N like plant biomass, fertilizer material and soil samples.
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TONE PRODUCING TUNING DEVICE

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Tuning devices are used in the field of music to tune instruments to the desired pitches to produce sounds pleasant to the human ear. Modern tuning devices are made from electronics devices designed to detect and measure the frequency of sound produced by an instrument. Additionally, the device may also include a speaker which produces a desired tone that a musician can use as a reference to match. Once such implementation of this device includes an oscillator that accepts an input indicating the desired note. Each note has a unique frequency, so the implementation of an oscillator stands as a possible solution to convert a signal into a desired tone, since the control and output can be designed to be one-to-one. The oscillator would be controlled by the user, and the output can be put through a transducer to produce the desired tone.
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EVIDENCE BASED CLINICAL PRACTICE GUIDELINE FOR DIABETES

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Diabetic retinopathy is one of the principal causes of vision loss in middle-age and older adults worldwide. According to the America Diabetes Association, screening for diabetic retinopathy is important because the majority of patients who develop this disease have no symptoms until macular edema and/or proliferative diabetic retinopathy occurs. This study is a retrospective chart review of primary care providers in a low income community clinic to identify adherence to evidence-based clinical practice guidelines for diabetic retinopathy screenings. The purpose of this study is to measure the number of Type 2 diabetic patients who are referred to an ophthalmologist for an annual retinal eye exam and documented completion of the eye examination over a one year period in the primary care setting. An inner-city clinic in West Tennessee will provide data for this study. Inclusion criteria are adults aged 18-89 with the diagnosis of Type II diabetes. The sample size will be 50-100 charts. The information will be provided in conjunction with the practice site to assist the clinic's efforts in quality improvement. Namely, this data will be utilized to improve the mechanism of the patient referral process for eye exams of diabetic patients.
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COLORECTAL CANCER SCREENING RATE OF A LOCAL CLINIC IN NORTHEAST ARKANSAS

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Colorectal cancer (CRC) is one of the most preventable types of cancer; however, it remains to be the second-leading cause of cancer deaths in the U.S. CRC screening may be performed via direct visualization and stool-based tests. For adults at an average risk of CRC, screening is recommended to begin at the age of 50 and continue until the age of 75. In 2017, Arkansas ranked 46 among all 50 states and the District of Columbia with a CRC screening rate of 62 percent. The purpose of this study was to compare the CRC screening rate of a clinic in Northeast Arkansas to the State of Arkansas average of 62 percent. The specific findings of this study may be studied and used to increase the adherence of CRC screening to decrease the amount of CRC-related deaths. The study was conducted using a retrospective chart review. Results of the study show that the CRC screening rate of a local clinic in Northeast Arkansas was 76 percent. These findings are significantly higher than the state average of 62 percent, however, they do not meet the 2018 initiative set by the CDC to have all persons greater than 50 to be screened for CRC.
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BAYLOR SEXUAL ASSAULT SCANDAL: CRISIS COMMUNICATION AND BRAND REPUTATION

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In 2016, Baylor University hired Pepper Hamilton, a law firm in Philadelphia, to investigate its handling of Title IX cases after two of its football players were convicted of sexual assault. Baylor's communications with its students, faculty and the community were almost nonexistent. From the continuous mishandling of reports on campus to not informing the community of the situation, it was clear that its procedures were inadequate. The situation has been drawn out for the last two years and continues to get worse. This case study analyzes the university's crisis communication strategy and the response from students, alumni, and other institutions involved in the situation. The analysis was formed from the reviewing of Baylor's website, social media posts, and local and national news articles from Jan. 31, 2016 to Oct. 30, 2018. Baylor's response was not as effective as it had hoped, as it continues to struggle through the two-year long scandal. Other universities can and should use Baylor's missteps as a learning opportunity to better their Title IX case handlings and how well they show care towards students.
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SMOKING CESSATION PRODUCTS USED AS FIRST LINE OF DEFENSE

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Smoking is the leading cause of preventable death in adults in the United States of America, yet many primary care providers leave this educational point out of their office visit. Although studies show that 70 percent of smokers desire to quit smoking, only 43 percent attempt to quit smoking. There is a disconnect when educating patients on the importance of smoking cessation. Many different medications are used for smoking cessation, but the first line of defense for smoking cessation is nicotine replacement therapy (NRT), Varenicline (Chantix), and Bupropion (Wellbutrin). The purpose of this study is to identify the types of medications that are being prescribed to patients who suffer from nicotine dependence in the primary care setting within Memphis, Tenn. This study will use an observational analytic approach with a retrospective chart review. The aim is to identify what first line smoking cessation products are prescribed to a specific group of people (e.g., males, females and young adults). This study will include approximately 50 patients and analyzes what medication they were prescribed as first line of defense for smoking cessation. Providers should be educating patients on smoking cessation products and prescribing these products based on clinical guidelines to aid in smoking cessation.
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AUTOMATED PAPER DELIVERY ROBOT

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The main purpose of this project was to design and build an automated robot capable of delivering papers to a specified location. This robot was to be controlled using a PLC. The robot designed is a follow the line robot with a dump tray to deliver papers at a specified location. The robot was built out of aluminum tubing and Plexiglas. It incorporated a motor and wheel set, a linear actuator, and a few 3D printed items. After a semester of design, fabricating, and coding, the robot was successfully completed. This robot was capable of following a line until it got to its destination. After reaching its destination, the actuator would lift the dump tray until the papers fell out. A buzzer would then go off to inform the recipient that their load has been delivered.
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CHRONIC SHOULDER DISLOCATION: AN IMAGING CASE STUDY

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Joint dislocations are rare. When joint dislocations occur, they are most commonly found in the shoulder and are generally treated by physicians in an emergency setting. However, there are cases in which an acute shoulder dislocation goes undiagnosed. Chronic shoulder dislocation is defined as a case in which the diagnosis was missed for several days to weeks after the initial dislocation. This missed or delayed diagnosis may lead to considerable pain and functional disability for affected patients (Chung et al, 2016). In this case study, a 62 year old male presented to the MRI department with a history of chronic shoulder dislocations. Various medical imaging modalities (X-ray, CT, and MRI) demonstrate radiographic evidence of an unusual shoulder joint with resorption of a large portion of the glenoid, severe osteophytosis of the humeral head, rotator cuff tears, and associated edema. A range of treatment options was found in the literature, with no form of treatment stressed over other options. For this particular patient, joint replacement is needed.
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FAMILIARIZATION SESSIONS ARE NOT NECESSARY FOR SPRINT ASSESSMENTS IN RUGBY ATHLETES

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Familiarization sessions are practice trials that allow the participants to experience what activities will be performed during the study, with the aim of mitigating a learning effect. Therefore, they will be familiar with the tasks asked of them during the study and valid measures can be obtained. The purpose for using this method in this setting was to determine if a familiarization session was necessary for the given task of sprints in this particular population. An experimental group (n = 11) of club rugby players were asked to perform three 20-meter sprints on an indoor turf field separated by 60-second rest periods. The participants began in a two-point stance with a five-yard flying start to minimize differences in starting mechanics. Photocell laser timing gates were placed every 10 meters to time the sprints from start to end. No statistical ($p = 0.41$) or practical ($d = 0.10$) differences were found between familiarization and formal sprint trials; indicating that a sprint-focused familiarization trial is not necessary to prevent a learning effect in club rugby athletes. Researchers investigating changes in sprint performance in club rugby athletes can consider removing sprint familiarization sessions for more efficient use of time.
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NITRATION OF 4-NITROPHENOL USING NITRATE SALTS

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A prevalent environmental pollutant, 4-nitrophenol (4-NP) is a compound used in chemical manufacturing plants for the production of certain drugs and insecticides. Research into the reactivity and interaction of 4-NP with other compounds in the environment gives information that can help in finding ways to remove it. 4-NP is known through certain reaction processes to be a precursor in the formation of 2, 4-dintrophenol (DNP); an even more harmful pollutant. Its interaction with nitrate salts present in the water and atmosphere are of interest due to the potential for nitration to DNP. Few studies have been done on this hypothetical reaction mechanism which makes the contribution of this research valuable. Unexpectedly, it was found that 4-NP degrades photo-chemically, and that led to a change in the initial research goals. Testing by gas chromatography-mass spectrometry (GC-MS) was conducted on a series of samples of 4-NP in solution with nitrate salts to determine if DNP was produced. The experiment showed changes in the concentration of 4-NP in the samples, however DNP was not detected by GC-MS analysis.
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ADHERENCE TO ALCOHOL SCREENING GUIDELINES WITHIN PRIMARY CARE

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Alcohol misuse is the third leading preventable cause of death in the U.S. It is associated with multiple adverse health consequences, including liver cirrhosis, various cancers, unintentional injuries and violence. The U.S. Preventive Services Task Force (USPSTF) recommends primary care providers screen all adults for alcohol misuse. However, research confirms USPSTF screening tools are underutilized. The latest published in 2016 indicates 96 percent of providers reported screening patients for alcohol misuse. Among those that screened, only 38 percent used a USPSTF screening tool. The purpose of this study is to evaluate adherence of providers documenting USPSTF screening tool usage in patients age 18 and older in a rural Southeast Missouri clinic. A retrospective chart audit was performed assessing for documented alcohol misuse screenings. Primary care practices can benefit from this research by evaluating their usage of recommended screening guidelines to detect patients who misuse alcohol and facilitate appropriate intervention. Results determined the alcohol misuse screening rate (98 percent) and USPSTF screening tool utilization rate for alcohol misuse in patients age 18 and older in a clinic in rural Southeast Missouri (0 percent), were not significantly different than the national average of (96 percent) for screening and (38 percent) for USPSTF screening tool usage.
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SOBRIETY STRATEGIES FOR COLLEGE STUDENTS

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Over the years, alcohol consumption has become a pervasive part of the college experience. Students are continuously involved in off-campus and campus events that promote college drinking. The effects of college drinking have caused detrimental effects to the mental, physical and social health of students throughout college campuses. To reduce potential alcohol use disorders on college campuses and to help in the recovery of problem college drinkers, it is crucial to understand the behavioral differences between students classified as non-drinkers, social drinkers and problem drinkers and to promote appropriate tactics to maintain recovery. College students of Arkansas State University were administered a survey that will question their prior alcohol history, extracurricular activities and personal preferences. Data from the surveys will be interpreted to help determine the necessary results of this study.
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LITERACY FOR ELL STUDENTS

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The amount of English Language Learners (ELLs) in America is significantly increasing in our educational system. Many ELL students are educationally falling behind English-speaking students. The purpose of this action research paper is to look at the significance that language barriers create for students, teachers and parents and to also look at the best approaches to help decrease the deficit that English Language Learners are facing. A method that has been found to be effective is incorporating the students' languages into the classroom, and an effective approach in incorporating ELLs' primary language is through the preview, view and review method. During the preview, the teacher provides the student with content that is in the student's primary language; the view step is when the teacher provides pictures that are labeled in English; the final step of review alternates the primary language and English. This helps contribute to their English acquisition, which, in turn, contributes to their future success.
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A LOCAL CLINIC'S INFLUENZA VACCINATION RATE OF COPD PATIENTS VERSUS THE NATIONAL AVERAGE

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Influenza causes detrimental effects on individuals of all ages and health status, but few are impacted as greatly as those with chronic obstructive pulmonary disease (COPD). It's beneficial to determine the influenza vaccination rates of local patients with COPD to establish how closely rates compare to the national average. While COPD is incurable, symptom management and exacerbation prevention are possible when measures, such as influenza vaccinations, are incorporated into the plan of care. Many individuals with COPD live in the rural delta region. Lower socio-economic class and rural geography have been found to be significant contributors to this disease. This study aims to utilize a retrospective chart review to audit the influenza vaccination rates of COPD patients age 50-75 in a primary care clinic located in Paragould, Ark. Although data is still pending, the results will reveal if a discrepancy in vaccination rates exists compared to the national level. The results will allow clinic administration to identify potentially inadequate practices and improve them in an effort to increase the health of one of our most vulnerable patient populations.
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THE IMPACT OF A SCHOOL'S GRADE LEVEL CONFIGURATION ON LITERACY SCORES IN MID-SIZED ARKANSAS DISTRICTS

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Transitions between buildings within a school district can be challenging for students. According to recent research by Combs (2011), students who remained in the same building for a longer period of time scored significantly higher in reading and mathematics than students who transitioned more frequently. This study aims to explore whether grade level configurations of districts have an impact on standardized assessment scores. ACT Aspire data will be compiled for eleven school districts in Arkansas of similar size and socioeconomic makeup. The schools will be ranked based on the percent of students scoring proficient or advanced in the English Language Arts portion of the assessment. It is proposed that students attending districts with wider grade level configurations will perform at a higher level than their grade level peers in districts with more frequent transitions. Results from this study could offer a mid-sized Arkansas district one potential solution (changing the building-wide grade level configurations) in an effort to address a multi-faceted deficiency (continued poor performance on statewide assessments).
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CHARACTERIZATION OF MICROSPORE EMBRYOGENESIS IN SOYBEAN (GLYCINE MAX)

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To our knowledge, a practical system for producing doubled haploids of soybean (Glycine max) is not available. Our previous research identified potential pyramidal stressors to promote the formation of putative gametic (microspore-derived) calli in soybean anther cultures. These pyramidal stressors were applied to the culture of isolated microspores of genotype IAS-5, including: Pretreatment of donor plants at 10°C day/8°C night for three days, followed by 4°C overnight; initial incubation at 11°C in the dark with nitrogen starvation; addition of light at 18°C and 25°C incubation. With minimal adjustments in the culture protocol, such as using 2, 4-dichlorophenoxyacetic acid as auxin and 6-benzylaminopurine as cytokinin, 100 percent of the culture replicates exhibited sustained cell divisions leading to formation of complex structures including embryos. Preliminary flow cytometry results indicated the haploid status of the isolated microspores placed into culture, and the occurrence of spontaneous chromosome doubling under certain culture conditions. Embryo development has been documented and compared to the androgenesis model system, Brassica napus, with many similarities. The culture system described here provides a new platform for the study of soybean androgenesis, and a possible strategy for the production of soybean doubled haploids.
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THE IMPORTANCE OF PATIENT POSITIONING IN DIAGNOSTIC IMAGING

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Patients referred for diagnostic imaging exams are typically injured, in pain or simply unwell. These patients have limited mobility and obtaining a "textbook" worthy image is a challenge. Technologists must creatively adapt to patient movement limitations, providing for patient comfort while creating a quality image for radiologist interpretation. This poster presentation will demonstrate common radiographic imaging errors associated with a lack of patient mobility, including the elongation, foreshortening and magnification of body images due to patient positioning errors. Multiple scenarios were created with radiologic sciences faculty to produce elongation, foreshortening and magnification of two radiographic phantoms within the x-ray lab. Radiographic exposure techniques remained the same for all positions to allow for consistent radiographic brightness and high spatial resolution. Resulting images demonstrated the significance of improper positioning and its associated distortion effect. Body positioning is crucial in radiologic sciences because improper positioning can simulate pathological conditions and lead to a misdiagnosis.
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DOES A RURAL CLINIC IN ARKANSAS MEET THE 100% ADHERENCE RATE OF THE PRESCRIPTION DRUG MONITORING PROGRAM AS RECOMMENDED BY THE STATE OF ARKANSAS

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Opioid addiction and overdose death rates are rising at all socioeconomic levels. Mandatory access of prescription drug monitoring programs (PDMP) have demonstrated a decrease in rates of addiction and overdose deaths. In Arkansas, the opioid overdose death rates increased significantly from 2000 to 2016. Since 2017, Arkansas law requires access of the PDMP every time prescribing schedule II and schedule III medications. The purpose of this project is to compare adherence rate of PDMP documentation at a local clinic in Arkansas to the State of Arkansas documentation rate for class II and class III medications before prescribing. This quality improvement project will be conducted using a retrospective chart review. The documented access rate was 54.64 percent. To improve addiction and overdose death rates, increased access of the PDMP will decrease the rates of prescribing schedule II and schedule III opioids.
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NEURAL NETWORK BASED SOIL RESISTIVITY PREDICTION FOR ARKANSAS

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Metal pipes used in cross-drains along or across the Arkansas highway system are susceptible to significant corrosion. However, Arkansas Department of Transportation (ARDOT)'s existing specification does not provide enough details about soil corrosivity effects on metal culverts. The main objective of the project is to develop neural network (NN) models for ARDOT districts for prediction soil resistivity by analyzing routine geotechnical soil data, water quality data and laboratory investigations of soils. Relevant literature has been reviewed, and physical and chemical properties of soil and water within state were collected for neural network modeling. Laboratory investigation results of collected soil samples were incorporated with the dataset. Several backpropagation algorithms were applied to train the model to predict soil resistivity of different locations. The detail analysis shows gradient descent backpropagation and conjugate gradient backpropagation have better accuracy among all other backpropagation algorithms. The R-values for the two NN models have been found as 0.601 and 0.735, indicating fair accuracies, and they can be used for prediction of soil resistivity of soils based on the routine geotechnical parameters. The findings will help ARDOT engineers in selecting appropriate metal culverts, which will assure better service life.
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A GENE EDITING APPROACH TO ELUCIDATE THE BIOSYNTHESIS OF STILBENOIDS IN PEANUT

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Stilbenoids are a non-flavonoid class of polyphenols that are important for their potential medicinal applications. Resveratrol is one of the most well-studied stilbenoid and several studies have described its anti-inflammatory, antioxidant and anticancer activities. Prenylated stilbenoids, which include arachidin-1 and arachidin-3, are produced to counteract biotic and abiotic stresses in peanut. Despite their importance to plant and human health, the biosynthesis of prenylated stilbenoids is still poorly understood. To address this issue, a CRISPR/Cas9 gene editing technique to knock out two stilbenoid-specific prenyltransferase genes in peanut hairy roots is being used to elucidate the contribution of these prenyltransferases to the biosynthesis of selected prenylated stilbenoids. Wild type and knock-out hairy root lines of peanut cv. Tifrunner are being developed. High performance liquid chromatography analyses of the wild-type hairy roots treated with elicitors show the presence of prenylated stilbenoids such as arachidin-1, arachidin-2, arachidin-3, and arachidin-5 in the culture medium. Our preliminary results suggest that peanut cv. Tifrunner hairy roots can produce prenylated stilbenoids. These studies will increase our overall understanding of the biosynthetic pathway of arachidins.
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EVALUATION OF AGGREGATE-BINDER COMPATIBILITY YSING SURFACE FREE ENERGY THEORY

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Aggregate binder compatibility is one of the effective parameters to measure the stripping. For evaluating the binder-aggregate compatibility and stripping resistance, the surface free energy (SFE) approach is one of the most effective approaches and used by many researchers. An asphalt binder with a higher SFE indicates its better stripping resistance. The total SFE along with its three major components (monopolar acidic, monopolar basic and a polar also known as Lifshitz-van de Waals components were estimated by using an Optical Contact Analyzer (OCA). The "Cohesive Energy" and "Compatibility Ratio," which are useful to evaluate the compatibility of binder-aggregate systems were then determined. Two types of aggregates (sandstone and sandstone) and asphalt binders from two different sources (Arabian and Canadian Crude) were tested in the laboratory. It was found that different aggregates act differently with binder from different sources. The adhesive energy was found higher when acidic binders are mixed with limestone rather than the sandstone due to the basic nature of limestone.
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ADHERENCE OF STATIN USE IN DIABETIC PATIENTS

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According to the American College of Cardiology, those with diabetes are at a higher risk of developing cardiovascular disease, or CVD, and should be closely monitored (2017). Cardiovascular disease is the leading cause of death in men and women in the United States (CDC, 2017) and most diabetics die of cardiovascular diseases (Zhang, Plutzky, Shubina, & Turchin, 2016). The prevalence of diabetes mellitus continues to rise in the United States and across the world. According to the American Diabetes Association, it is recommended diabetics aged >40 receive a moderate or high intensity statin to decrease chances of developing cardiovascular disease. The purpose of this study is to determine the frequency of diabetic patients being treated with statins in a rural primary clinic in Northeast Arkansas. A retrospective chart review will be used to gather data between the dates of Nov. 1, 2017 and Nov. 1, 2018. The inclusion criteria will be adults ages >40, with a diagnosis of diabetes type I or type II. Exclusion criteria will include those not diagnosed with diabetes, those <40 years of age, prisoners, or pregnant females. Data collection and analysis is currently pending.
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WILL IMPLEMENTING SCHOOL UNIFORMS HAVE A POSITIVE EFFECT ON NEGATIVE STUDENT BEHAVIOR

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With negative student behavior becoming prominent in today's mainstream media, what can school districts do to deter and decrease negative student behavior at their individual schools? The purpose of this action research is to determine if implementing school uniforms will be successful at altering negative student behavior into positive student behavior as it relates to peer-to-peer interaction. For the first semester, students and their behaviors will be monitored to collect data on their normal behavior. The second semester of the school year, school uniforms will be strictly enforced. Data collection, from both semesters, will consist of the administration, faculty and staff keeping anecdotal records of targeted students and having all students complete a survey at the beginning of the first semester and the middle of the second semester. The expectations were for some students, not all, to display a positive change in their behavior toward their peers and school. What was discovered was that wearing uniforms, for some students, had no effect on their behaviors and for the bullies, it dimmed their light and only slightly positively affected their behaviors. This work is very important to the education field because students are increasingly committing suicide at an alarming rate and anything that a school can do to deter this and increase positive interaction among their students, should be welcomed.
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THE EFFECTS OF USING BLOOD FLOW RESTRICTION EXERCISE FOR PROXIMAL STRENGTH AT THE SHOULDER

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This study is designed to assess the effects of blood flow restriction (BFR) on strength gains in muscles located proximal to the tourniquet in the upper extremity. Our hypothesis is that more strength gains will be achieved with the BFR group. Research will be conducted in the Red Wolf Center two times weekly for four weeks. The subjects will be randomly assigned to one of two groups: BFR experimental group and traditional strength training control group. The BFR group will receive BFR exercise by performing strength training at 20-30 percent of the subject's one repetition maximum. The control group will follow the standard American College of Sports Medicine strength and hypertrophy protocol for resistance training by exercising at 60-80 percent of a one repetition maximum. Following each session, each subject will be given a nutritionally approved protein shake that consists of one scoop of protein powder and water. Outcome measures will be assessed pre and post the four-week intervention. The study is still in progress. At the end of the study, statistics will be completed to determine if there are proximal strength gains at the shoulder using BFR versus traditional strength training protocol.
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CHRONIC PAIN AND PERSONALITY TYPE

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Chronic pain is a critical societal problem. In the United States, management of chronic pain is estimated to cost $650 billion annually. The lack of a uniform approach to management likely adds to the cost, and to patient frustration. Chronic pain is, "pain in one or more anatomic regions that persists or occurs for longer than 3 months and is associated with emotional distress or significant functional disability…". Our research assumes that psychosocial factors play a significant role in chronic pain. These factors are not always considered by healthcare providers. Historically, providers have approached treating chronic pain using a biological model and have neglected to understand how psychosocial factors may affect the duration, intensity, and perception of chronic pain. The purpose of this study is to better understand whether an association exists between personality type (possible psychosocial factor) and the predisposition to developing chronic pain. Using the NERIS explorer from which personality type can be determined, we propose to examine whether personality type is associated with development of chronic pain within a sample of chronic pain suffers. If such an association can be established, the importance of incorporating a psychological model into the treatment process can be implied.
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THE NATURAL FREQUENCY

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Vibration is defined as repetitive motion. Common examples of vibrations include an idling car or a plucked guitar string. It was found that all freely vibrating systems can be defined by a diagram consisting of equivalent mass and spring constants. The relationship between mass and spring constant causes the system's oscillations to occur at a specific frequency. This frequency, named the natural frequency, describes the vibration of the system when it is not subjected to a damping force. The consideration of a system's natural frequency is an integral step in its design. Our project displays this phenomenon by utilizing a series of varying masses attached to springs of varying stiffness. These spring-mass systems are attached to a horizontal bar made to vibrate by a system shaker at a frequency set by a wave generator. When the shaker is turned on, the wave generator frequency can be changed until it is found as equal to the natural frequency of one of the suspended masses. The spring-mass system whose natural frequency is reached will begin to oscillate smoothly with the metal bar. This synchronization of frequencies will be different for the varying springs, allowing for a visualization of their individual natural frequencies.
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NUTRITIONAL YEAST AS A PALATABLE SOURCE OF VITAMIN B12 FOR ADOLESCENTS

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My research is to test the palatability of nutritional yeast as a source of vitamin B12 in adolescents to prevent deficiency and megaloblastic anemia. One of the greatest nutritional risks for individuals following a vegan diet is a deficiency in vitamin B12, which is most often found in animal products. One method of incorporating more vitamin B12 into the vegan diet is adding fortified nutritional yeast to foods, which contains over 100 percent of the Dietary Reference Intake (DRI) for vitamin B12 in only two teaspoons. My research will be completed with an entrée of vegan macaroni and cheese. There will be one version of the macaroni and cheese containing no nutritional yeast and another version containing enough nutritional yeast to provide 2.5 mcg of vitamin B12 in every serving. The evaluators will complete an evaluation sheet after taste testing the products. The categories of evaluation are: color, aroma, taste, flavor, and mouthfeel. The findings from this experiment indicated that the version of macaroni and cheese supplemented with nutritional yeast was favored over the original version of the entrée.
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POTENTIAL USE OF RICE HUSK ASH (RHA) IN ASPHALT MODIFICATION

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Asphalt binder is an adhesive and organic mixture of various chemical compositions. The increased traffic volume, load, tire pressure and adverse weather conditions cause pavement deterioration over time. In that case, asphalt binder modification helps to avoid premature pavement damage by increasing the binder properties. In the field of asphalt modification, various types of elastomeric and plastomeric modifiers such as, Styrene–Butadiene–Styrene (SBS) and Kaolinite Clay (KC) compounds have been successfully used. A large portion of the currently used asphalt modifiers could potentially be replaced by Rice Husk Ash (RHA) particles. In this study, the finest RHA particles (RHA: 44 µm) were blended with a virgin performance grade (PG) binder (PG 64-22) at different percentages (one, two and three percent). In addition, Silica Fume (SF) and Class C Fly Ash (CFA) were also added to the virgin binder at the same percentages to have a comparative analysis. The viscosity of RHA modified asphalt was found to be significantly higher compared to the virgin binder. Moreover, the complex shear modulus was also found to be increased by the incorporation of RHA particle in the virgin binder, which also helped to increase the rutting resistance factor of the asphalt binder.
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TREATING HYPERTENSION ACCORDING TO JNC-8 GUIDELINES IN AFRICAN AMERICAN WOMEN

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Hypertension, commonly known as high blood pressure, is a common chronic disease that can have damaging health effects. Each day, approximately one thousand deaths occur as a result of uncontrolled hypertension, most of which are African American. The Eight Joint National Committee (JNC 8), requires treatment to attain a goal of systolic BP (SBP) < 140 mmHg and/or diastolic BP (DBP) <90 mmHg for people under 60 years of age. The prevalence of hypertension in African Americans is disproportionately higher than other racial groups. Effective treatment of hypertension has been proven to decrease risks of stroke, heart failure, heart attack and loss of life. In this retrospective study, the medical records of African American women ages 19-59 were reviewed using the JNC-8 guidelines to evaluate the pharmacological adherence at a local clinic in Memphis, Tenn. The study findings are expected to conclude the JNC 8 pharmacological guidelines are being followed for treatment of hypertension in African American women. Understanding the appropriate medication regimen along with adherence will significantly minimize the adverse impact of hypertension in African American women and improve the quality of care.
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POSTURING RESPONSES IN CONCUSSIONS: BOXING & MIXED MARTIAL ARTS FIGHTERS

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Loss of consciousness is reported in only about 10 percent of concussions. Posturing presentations such as the "fencing mechanism," "decorticate" or "decerebrate" postures, and "concussive convulsion" represent a brain injury with a loss of consciousness. The purpose of this study is to observe video evidence found on the internet from 2013 to 2018 of boxing matches and mixed martial arts fights to determine the rate in which a posturing presentation occurs in fights ending in a "knockout." We hypothesize that posturing presentations will be present in more than 10 percent of the cases. Two evaluators will independently observe videos of fights that occurred from 2013 through 2018 and determine whether or not a posturing presentation was demonstrated. In cases of disagreement the researchers will meet to share information and to reach a possible consensus. With continued disagreement, a third investigator will be consulted for a final decision. These findings could potentially help clinicians identify those who have suffered loss of consciousness as an indication of a concussion. Data will be recorded and analyzed.
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FRAMELESS LASER HARP

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The Frameless Laser Harp is a musical instrument first introduced in 1981 by the musician Jean Michel Jarre. The harp is a physical demonstration of many abstract theories and complex components related to Electrical Engineering. The instrument uses a laser, stepper motor, a Light Dependent Resistor (LDR), and a microcontroller to create a playable harp. Each string on a traditional harp is represented by light which is created by the laser and the motor. When one of the "light strings" is touched by the musician's hand, the microcontroller receives a signal from the LDR feedback loop, and a note is played. The Arduino microcontroller receives signals from the feedback loop, controls the stepper motor, and sends signals to the musical interface. Each part of the harp was researched and tested to ensure the best combination of components would be used to construct the project. After the components were chosen, the computer code was tested in order to ensure functional communication within the system. An enclosure to hold the circuit was then formed using 3D printed materials. This project applied methods learned throughout the undergraduate period while also enhancing knowledge of electronics beyond the classroom into a unique, real world application.
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TESTING SENSORY DIFFERENCES IN PEANUT BUTTER COMPARED TO SUN BUTTER IN A PREPARED RECIPE

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My research is designed to explore taste differences and preference between peanut butter and sun butter in an original dessert. Sun butter is made from sunflower seeds and is commonly used as an alternative for peanut allergies. There will be one focus group comprised of students and instructors at Arkansas State University that will sample and rate two products. Individuals interpret taste, texture, appearance and smell differently; therefore, the research is targeted at evaluating the sensory differences in peanut butter and sun butter. My research hypothesis is that when prepared in a dish there is no difference in peanut butter and sun butter.
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ANTIBIOTIC USE IN ADULTS WITH ACUTE BRONCHITIS

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There has been a growing rate of concern over the prescribing of antibiotics for viral illnesses and the emergence of antibiotic resistant microorganisms. There seems to be a trend in an overwhelming number of prescribed antibiotics for viral pathogens such as those seen in upper airway infections. Acute bronchitis is a common upper respiratory infection with primarily viral microorganisms as the main source of the infectious process. Although there is research and evidence-based practice to show that antibiotics are not warranted in treating the patient with acute bronchitis, the practice continues for various reasons such as patient satisfaction. To improve the understanding and provide teaching against this trend, a retrospective chart review will be conducted in a small, rural clinic in Arkansas. Approximately 40 charts are to be reviewed from Nov. 1, 2017 to Nov. 1, 2018. Only healthy adults aged 21 to 40 with no co-morbidities are to be included. The result of this study is currently pending.
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OPTICAL MOMENTUM REVERSAL IN NANOPARTICLE SURFACE ARRAYS

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Studies have demonstrated that certain materials can be propelled forward by photons emitted from diode lasers of various wavelengths within the visible light spectrum. This is enhanced by a momentum reversal due to the wave scattering of ejected electrons. This research aims to aid in the rapid calculation of electromagnetic wave scattering on surfaces using Rayleigh approximation for single as well as multiple particles in lossless and lossy materials. This holds the potential for creating large-scale enhanced propulsion surface materials. The research is comprised of closed-form calculations and simulation studies using this small particle approximation method for the purpose of enhancing tunable surface properties.
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GEOSPATIAL VARIABILITY AND COTTON PRODUCTION- PROFITABILITY IN A NORTHEAST ARKANSAS FIELD

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Cotton remains an important crop in rural communities in Arkansas. The state ranks fifth in cotton production in the U.S. with 445,000 acres planted in 2017, with a value of $370M. Farmers face challenges to improve profitability as well as to reduce negative environmental impacts. Site-specific crop management approaches in spatially variable fields would enable farmers to use production and protection inputs only where and when they are needed. This would improve efficiency. The goal of this research was to better understand sources and consequences of within field variability associated with soil texture, irrigation practices, insect pest pressure and weed control. We used a combination of soil, plant and pest monitoring methods to evaluate within-field variability in an irrigated, 40-acre commercial field in Mississippi County. Plant and soil monitoring activities included use of the COTMAN system and Watermark soil moisture sensors. Soil texture affected plant growth, fiber yield and fiber quality. Feeding damage by Lygus lineolaris, a key insect pest of cotton, also varied across soil textures and irrigation regimes. Understanding sources of variability will allow implementation of site-specific practices. Expanded use of such precision agriculture methods using spatial technologies likely will improve production efficiency and overall sustainability.
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A RURAL ARKANSAS CLINIC DEPRESSION SCREENING RATE VS THE NATIONAL AVERAGE

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Affecting men and women, depression is a common mental health disorder seen in primary care; we will understand how well a rural clinic in Arkansas is screening for depression when compared to the national average. 16.1 million Americans suffer with depression in the United States. Without screening it is estimated only 50 percent of depression episodes are caught. With suicide being one of the top 10 causes of death in the United States in 2015, screening is recommended by the USPTF at every wellness visit to decrease the amount of deaths caused by suicide. With depression being the main cause for suicide, knowing how well clinics are screening for depression is needed. A retrospective chart review was performed on wellness visits for adults aged 18-75 years old from Jan. 1, 2018 to June 30, 2018. Each chart was reviewed to determine if screening was completed for depression. A data analysis was performed to see the rate of depression screening. Data was collected, according to the data the clinic depression screening rate was above the national average at 40.6 percent. The findings of this quality improvement project will show how clinics in rural Arkansas compare to the national average when screening or depression.
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ANALYSIS OF DNA METHYLATION TO UNDERSTAND PROTEIN ACCUMULATION IN TRANSGENIC CORN SEEDS

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Transgenic plant based production for industrial enzymes is an evolutionary tool. Green Biofactories have powerful potential to produce desirable product on the most economical and efficient level. Seed itself provides protein a very stable environment, solving the problem of storage. Transgenic plants easily scale up production. Increasing population, climate change and low land, amounts to a less damaging production system. The transgenic plant based production system rather than microbial fermentation, is a possible solution for this rising scenario. Epigenetic factors influence protein accumulation during seed development. Non-coding RNA and DNA methylation influence protein coding genes. In this project, transgenic maize expressing manganese peroxidase gene was generated by using Agrobacterium tumefaciens transformation. With the globulin-1 promoter as a single insert in the genome, transgenic plants were variable in protein production. Expression was improved by backcrossing and high protein producing lines were selected by screening. Greenhouse grown plants were used to harvesting embryos and isolation of DNA and RNA. Next generation sequencing, genomics and transcriptomics are new technologies that may help us understand the potential influence of epigenetic factors on protein accumulation. RNA sequencing and DNA methylation may illustrate effects of epigenetic factors on protein coding genes.
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COMPARISON OF RATE OF STATIN PRESCRIPTION IN DIABETICS

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Diabetes Mellitus (DM) affects more than 30 million Americans and contributes to an increased risk of cardiovascular disease, which is the leading cause of death in the nation. Multiple studies have demonstrated the effectiveness of statins in reducing the risk of cardiovascular complications among diabetics due to their anti-inflammatory properties and ability to shrink existing atherosclerotic plaques. However, prescribing statins to diabetics for whom the prescriptive therapy is recommended by the American Diabetes Association (ADA) occurs at a rate of less than 40 percent in the nation. The purpose of this study was to compare the rate of treatment with statins among qualifying diabetic patients at a rural clinic in Arkansas to the national rate. A quantitative retrospective chart review was used. Additionally, the charts of diabetic patients for whom statin therapy was recommended during the time frame of January 1 to Nov. 5, 2018 were reviewed to determine the rate of prescriptive therapy with statins. As for findings, data collection is ongoing and analysis is pending. Studies suggested that guideline-adherent prescribing does not adversely affect the quality of life of diabetics, and this study could be used to argue that prescribing of statins should be increased.
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DEPRESSION SCREENING RATE IN A RURAL HEALTH CLINIC IN PEMISCOT COUNTY, MISSOURI, COMPARED TO A NATIONAL RATE OF 4.2 PERCENT

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Depression is defined as a period of at least two weeks duration in which there is either depressed mood or loss of interest/pleasure. It is also determined by at least four of the following symptoms: depressed mood almost every day, anhedonia, decreased physical activity and slowed thought process, fatigue, feeling of worthlessness or excessive guilt, inability to concentrate, recurrent thoughts of death or suicide with/without a plan, or a suicide attempt. Sadly, over half of people with depression are undiagnosed. In order to combat these statistics the United States Preventative Services Task Force (USPSTF) recommends screening of adults 18 and older for depression. Results of this study show a four percent depression screening rate in the primary care setting, which correlates to Aknicigil and Matthews' 2017 finding of 4.2 percent. This study found the rate for depression screening is unacceptable and highlights a facet of care that is below the standard set by USPSTF. Adjusting patient intake to include depression screening may trigger the provider to discuss these results with the patient, aiding in a diagnosis of subclinical/clinical depression, and assist in providing an accurate diagnosis and treatment plan to improve overall health.
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THE INFLUENCE OF GENDER STEREOTYPES ON THE PERCEPTIONS OF STALKING

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An estimated 15.2 percent of women and 5.7 percent of men have been a victim of stalking during their lifetimes. The goal of the current study is to determine if the gender of the stalker influences participants' endorsement of stalking myths, adding to our knowledge about the effect of gender stereotypes on perceptions of stalking. Sinclair (2010) found that men are more likely to blame female victims in terms of intimate aggression. In the current study, it is assumed that participants would say that the female is the most to blame, the male would be less to blame, and the gender neutral would be the least to blame. Undergraduate students at Arkansas State University were randomly assigned to one of the three surveys: female target/male stalker survey, male target/female stalker survey, or a gender-neutral survey. In the survey, the participants were asked a series of questions to determine if they perceive the target as being flattered by stalking, if they take the stalking seriously or not, and if they blame the target according to gender script. Results revealed that there was a significant difference in victim blaming category. Participants who read about a male victim were more likely to blame the victim than those who read about a female victim or the gender neutral victim.
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UNIVERSAL MRSA DECOLONIZATION VERSUS SCREENING AND ISOLATION OF ICU PATIENTS

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Methicillin-resistant Staphylococcus aureus colonization is a modifiable risk factor in reducing hospital-acquired infections. Because methicillin-resistant Staphylococcus aureus causes a large percent of hospital-acquired infections, the current practice guidelines recommend varying approaches in the surveillance of methicillin-resistant Staphylococcus aureus-colonized high-risk populations. Standard care at a local hospital is for all patients admitted to the intensive care unit be screened for methicillin-resistant Staphylococcus aureus colonization and isolated with contact precautions if positive. In an attempt to reduce cost and isolation days, a pilot of universal decolonization of methicillin-resistant Staphylococcus aureus with povidone-iodine nasal antiseptic in conjunction with chlorhexidine bathing was conducted. A retrospective chart review compared the baseline data from charts before and during the pilot project. Data collected included the number of isolation days, associated costs, and rates of hospital-acquired methicillin-resistant Staphylococcus aureus for each cohort. Data from the pilot showed patients spent 483 fewer days in isolation with a cost savings of 41,596 dollars and found no difference in methicillin-resistant Staphylococcus aureus infection. This data suggests the universal methicillin-resistant Staphylococcus aureus decolonization efforts from the project may reduce healthcare costs. The primary cost reduction resulted from no longer isolating the patients. Fewer days in contact precautions can benefit both the patient and the hospital staff.
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ONSET OF MENSES IN DESHA COUNTY ARKANSAS VERSUS THE NATIONAL AVERAGE OF 12.8 YEARS

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Puberty for young girls is plagued by myths and misconceptions, many centralized around menses. Influenced by both environment and genetics, the onset of menses for a young girl is life-altering and often associated with becoming a woman. While the onset of menses might be embarrassing, early menarche has been linked to depression, anxiety, poor self-image, early pregnancy, reproductive tract cancers and substance abuse. The purpose of this quality improvement project is to determine if menarche in Desha County, Ark., is comparable to the national average of 12.8 years. A retrospective chart review of 200 charts from August 2016 to November 2018 from two Desha County clinics will be completed to obtain age at menses onset, race and ethnicity. Data collection and analysis are currently ongoing. Collected data will be shared with the clinics upon completion of analysis. Gathered data could be used to increase education on menstruation in public schools in Desha County. One can hypothesize that with more education surrounding menses, there will be a decrease in STD and teen pregnancy rates in the county.
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SYNTHESIS OF NEW 2-AMINOPYRIMIDINES

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There is always a need to find new pathways of synthesizing biomolecules, in order to discover more efficient methods that give a higher yield of the desired product. The multi-step reaction described uses the synthesis of a Biginelli dihydropyrimidinone, the oxidation and isomerization of the product, and a derivative of the Ugi reaction to make varying 2-aminopyridines which can be used in drugs used to treat cancer and, indirectly, HIV. The 2-aminopyridine group is found in such pharmaceuticals. The dihydropyrimidinone compounds synthesized in the first step are then oxidized using potassium persulfate to make a 2-hydroxypyrimidine derivative via isomerization. The original Ugi reaction uses an aldehyde, amine, isocyanide, and a carboxylic acid to form 2-aminopyridines. In this variation, called the Ugi-Smiles reaction, the carboxylic acid is replaced with the previously oxidized dihydropyrimidinone. The 2-aminopyrimidine substructure of the product is found in many drugs, as well as bioactive compounds. The goal of this ongoing research is to synthesize these medicinally useful compounds in this efficient manner, then isolate and purify them for potential biological testing.
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WHOLE EFFLUENT TOXICITY (WET) TESTING IN TWO AGRICULTURAL DITCH SYSTEMS USING PIMEPHALES PROMELAS AND CERIODAPHNIA DUBIA

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Biota dependent on water can be affected by contaminants in agricultural runoff including sediment, nutrients, pesticides, herbicides, and insecticides. Whole Effluent Toxicity (WET) is used to evaluate lethal and sublethal effects of water on an organism. This study uses standardized guidelines provided by the EPA for WET testing to determine if there is a toxic response by Ceriodaphnia dubia and Pimephales promelas to water from agricultural ditch sites in northeast Arkansas. Organisms cultured at the Arkansas State University Ecotoxicology Research Facility were exposed to water for seven days in seven tests from October 2016 to June 2018. Water was renewed daily, and the organisms were monitored for growth and survival (P. promelas) and reproduction and survival (C. dubia). Endpoints were assessed in Comprehensive Environmental Toxicity Information System™ version 1.9.2.8 2017 using Dunnett Multiple Comparison Test (=0.05). There was no significant reduction in C. dubia survival across all tests. Some sites showed a reduction in P. promelas growth in two separate tests, and P. promelas survival in one test. Overall, sites that showed lethal and sublethal effects from water did not have higher water quality parameter values than test that showed no significant effect.
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CONTINUOUS TO DISCRETE TIME CONVERTER

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In communication, it is often better to transmit an analog signal as an equivalent DC signal instead. Analog signals are highly susceptible to noise interference and the circuits required to transmit and receive them can be difficult to design and costly to fabricate. It is often desirable, then, to convert an analogue signal, such as a sample of human speech input through a transducer, into a digital signal and transmit it as such. On the receiving end, this signal is restored to its analog state and output through a transducer. This is how modern telecom (telecommunication) systems work with respect to mobile phones. Such a process requires the conversion of analog to digital signals. Such a conversion requires that the analog signal be discretely sampled in time and its amplitude discretized. The goal of this project is to produce a continuous-time-to-discrete-time converter circuit utilizing a JFET chopper circuit and a pulse train generated by an Astable or Monostable multivibrator. This circuit would perform the first half of analog to digital conversion.
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A COMPARISON OF WHITE AND BROWN SUGAR IN A PRODUCT CONTAINING COCONUT

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Our research is designed to introduce an ingredient from another country, coconut, and test the palatability in relation to different ingredients used in parallel for the same recipe. A new product has been formulated using coconut. The recipe is KoKo's Coconut Chocolate Chip cookies. For this recipe, brown sugar and regular sugar will be tested by a focus group to see which type of sugar parallels in taste better with the coconut. Both the original and modified recipe were created to introduce a new inventive coconut recipe into the American dessert culture. Benefits from coconut will also be introduced during this research project. A study will be conducted with a score card and taste test.
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RESISTING TEMPTATION: SHORT FORM DEVELOPMENT AND VALIDATION OF A SIX SINS INVENTORY

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Temptations are often ignored within psychological research about goals, despite the role they serve in derailing goal achievement. Curtis, Hatvany, and Burkley (2018) addressed this deficit by developing the 49-item Seven Sins Inventory (SSI), a survey with seven factors based on the seven deadly sins (i.e., pride, wrath, envy, lust, gluttony, greed, and sloth). Subsequently, Berry, McGowen, and McGowen (2019) assessed the SSI's structure and suggested that a 35-item, six-factor model (i.e., six sins) was a better fitting representation of temptations. Because 35 items may be excessive in certain studies, the present research developed and validated a short form of the reimagined Six Sins Inventory (SSI-SF). Data was collected via 214 introductory psychology students (68.70 percent female), who completed the SSI. Item response theory modeling removed 15 poorly performing items, forming the 20-item SSI-SF. Reliability was comparable between each factor of the SSI and SSI-SF (= .83-.93). Estimated theta scores were highly correlated between each factor in both versions (r = .922-.995), and a confirmatory factor analysis suggested the SSI-SF's six-factor model was a good fit (CFI = .98). This suggests the SSI-SF embodies six sins as successfully as the SSI. Nonetheless, both versions contribute important information to the literature.
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COMPARING WHOLE WHEAT FLOUR TORTILLAS AND WHITE FLOUR TORTILLAS IN A DESSERT RECIPE

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The purpose of this research is to modify one ingredient in a recipe to determine which ingredient is preferred. This research is designed to establish if a typical, modern family prefers whole wheat flour tortillas or white flour tortillas in a dessert quesadilla. This food item will incorporate flavors typically found in foods outside of North America in a dessert recipe. In order to retrieve the appropriate data, there will be one focus group composed of faculty and students to test the original recipe and the modified recipe. The focus group will use a Hedonic scale of 1-5 to rate the overall flavor, texture, aroma and appearance in both recipes. My research hypothesis is that whole wheat flour tortillas will be equally or greater preferred than white flour tortillas.
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REPLACEMENT OF CONVENTIONAL ELASTIC RECOVERY (ER) TEST BY DYNAMIC SHEAR RHEOMETER (DSR) BASED TESTS

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Like other state Departments of Transportation (DOTs), Arkansas Department of Transportation (ARDOT) evaluates modified asphalt binders by using a Dynamic Shear Rheometer (DSR) per AASHTO (American Association of State Highway and Transportation Officials) Standard 315. AASHTO T 315 is meant to be used for characterizing modified asphalt binders. On the other hand, empirical and time consuming Elastic Recovery (ER) method (AASHTO T 301) is followed by some DOTs to characterize the modified binders. However, the effects of the elastomeric or plastomeric polymer are not accurately identified through these conventional tests. The main goal of this study is to replace the elastic recovery test by DSR based tests. Multiple Stress Creep Recovery (MSCR), ER-DSR, and Binder Yield Energy Test (BYET) have been explored to find their effectiveness. Three ARDOT-certified asphalt binders (PG64-22, PG70-22 and PG76-22) have been selected for this study. These binders have been prepared by blending styrene-butadiene-styrene (SBS) polymer, PPA, or a combination of both. Test results indicate that the MSCR, BYET, or ER-DSR test would be a good replacement of the ER test to characterize polymer-modified binders. Further investigations are being done for characterizing PPA-modified binders, but the presence of PPA can be determined by conducting pH tests.
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SYNTHESIS AND ANTIPROLIFERATIVE ACTIVITY OF THIAZOLO-ANDROSTENONES AGAINST BREAST CANCER CELL LINES

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Breast cancer is a common disease that affects thousands of families across the USA. The American Cancer Society estimates that around 268,600 cases of breast cancer will be diagnosed in women during the year 2019. With these numbers rapidly rising, the need for development of new anticancer drugs is imperative Thiazole and androstenone derivatives are well known for their wide range of anticancer properties. Thiazoles are heterocyclic compounds containing nitrogen and sulfur that are found in many natural products and approved drugs. The fusing of these two drug-like molecules as one thiazolo-androstenone hybrid gives promising hopes in potent activity against cancer. The reaction of thioamide and thiourea derivatives with 6 -bromoandrostenedione readily forms these thiazolo-androstenones. Around 60 novel molecules have been synthesized and tested against NCI-60 cancer cell lines with several of the molecules showing potent activity against breast cancer lines. Ongoing studies will determine the potency of these molecules against cancer cell lines as well as the toxicity against healthy cell lines.
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TESTING THE PALATABILITY OF WHOLE WHEAT FLOUR VS. ALL-PURPOSE FLOUR IN DESSERTS

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My research is designed to test the palatability of whole-wheat flour versus all-purpose flour among families in Arkansas utilizing an Italian dessert dish, biscotti. Whole-wheat flour is a much healthier alternative to all-purpose flour. Whole-wheat flour contains more fiber, calcium, iron, protein and many other nutrients compared to all-purpose flour. In a controlled setting I will have a focus group composed of Arkansas State University students and instructors to test both products and rate them accordingly. The focus group will be blinded to which product is which. People have a tendency to think that the unhealthier product tastes better without even trying the healthier alternative. My research is intended to demonstrate that whole-wheat flour indeed tastes as good, if not better than all-purpose flour and can serve as a suitable alternative taste and health wise for families in Arkansas.
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OXIDATION AND REDUCTION ENZYMES AS BIOREMEDATION AGENTS

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Agricultural and industrial pollution have a negative impact on the environment and are expensive to remediate. Our focus is the production of recombinant proteins from genetically engineered maize that are useful in bioremediation. Specifically, our project deals with the use of two enzymes, manganese peroxidase (MnP) and laccase (Lcc). These enzymes occur naturally and are used in the degradation of lignin in the fungi white-rot fungi, Phanerochaete chrysosporium and Trametes versicolor. Currently, we are investigating the enzymatic activity of each enzyme, individually and sequentially, in the degradation of the synthetic dye, methyl orange (MO) through oxidation and reduction reactions. Our aim is to identify and quantify potential degradation products using analytical techniques. Already, we have confirmed enzymatic activity of MnP and Lcc on MO using absorbance assays. Surprisingly, we discovered these enzymes have improved efficiency when applied sequentially. The promising results suggest potential bioremediation of other pollutants of concern. As a junior fellow in the Bearcats in Biotechnology program, I have learned and implemented techniques such as: HPLC, High Throughput absorbance assays, GC-MS, agarose gel electrophoresis, and protein purification (anion exchange column chromatography). This research will produce a possible method of bioremediation using genetically engineered maize.
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READING INTERVENTION FOR ELLS: RECENT ADOLESCENT IMMIGRANTS

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According to the new "Science of Reading" series produced by the Arkansas Department of Education (ADE), less than 40 percent of students in Arkansas are reading on grade level. Adolescent struggling readers have very few years left in the education system in order to remediate this deficiency, especially when they are recent immigrants with a language barrier. Society needs to have well educated, articulate individuals who think critically, so it is crucial that an effective reading intervention program for adolescents is found. Leveled Literacy Intervention has had promising results at the elementary level, causing many junior highs to test the program. Benchmark Assessment System (BAS) tests were administered to students in August 2018 and January 2019. Running records were performed on students biweekly, students made videos of themselves reading to practice targeted phonics skills, and student interviews were conducted. The students enrolled in Critical Reading have been in the United States for less than two years. The students emigrated from the Marshall Islands, Mexico, El Salvador, Puerto Rico, Honduras, Vietnam, and the Philippines. George Junior High's student population is very diverse and the school is classified as Title I with more than 70 percent of students qualifying for free or reduced lunches.
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A PRIMARY CARE CLINIC'S HPV VACCINE RATE VERSUS THE NATIONAL AVERAGE OF 65.5%

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HPV vaccination initiation and completion continue to increase. Studies have found reductions in cervical HPV infection, genital warts and cervical precancers in the United States. Protection against HPV-related cancers will continue to increase if adolescents and their parents are educated about the cancer prevention benefits of the HPV vaccine and clinicians consistently recommend and simultaneously administer Tdap, MenACWY, and the HPV vaccine at 11-12 years old. The purpose of this study is to illuminate the difference in the first dose HPV vaccination rate of patients age 13-17 in a rural primary care clinic in Sikeston, Mo., to the national average of 65.5 percent for the first dose HPV vaccination in patients age 13-17. This study will be conducted using a retrospective chart review. This research shows that providing reassuring recommendations along with using each patient visit to review immunization status and offering the HPV vaccine at the same time can improve vaccination rates. Research remains in progress. It is essential to utilize opportunities to vaccinate because although immunization rates for other adolescent vaccines continue to improve, HPV rates have not.
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HEAT TRANSFER ANALYSIS: MULTI-FIN

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In this experiment, students preformed a heating and cooling process on a structure made of mild steel. The structure consists of a baseplate with three parallel fins welded in a symmetric fashion. Collection of data involves one process of activating the heater and tracking the thermocouple output in degrees Celsius to around 70 C. At this point, heat is removed from the base plate, and the thermocouples are continuously monitored until they all returned to ambient temperature. The data gives extensive information on fin efficiency, heat transfer rate, and thermal conductivity of the material. Radiation calculations can also be determined from the data from heat transfer between the fins.
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ROLES AND MOLECULAR MECHANISMS OF THE PHOSPHOR-REGULATION IN CAP1 FUNCTIONS

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CAP1 (Cyclase-Associated Protein 1) is a conserved actin-regulating protein in eukaryotes. We previously reported that mammalian CAP1 regulates cell migration and adhesion, and mounting evidence suggests involvement of CAP1 in the invasiveness of a growing list of human cancers. We recently identified a regulation mechanism for CAP1, through transient phosphorylation at the Ser307/Ser309 tandem site, and GSK3 (Glycogen Synthase Kinase 3) phosphorylates Ser309. It is of critical importance to fully establish roles for the phosphor-regulation in CAP1 cellular functions, and unravel further cell signals that regulate both phosphorylation and dephosphorylation of CAP1. Such mechanistic insights may ultimately lead to strategies targeting CAP1 or its related cell signals in controlling the invasive cycle of cancer. Our results demonstrate a required role of transient phosphorylation for CAP1 functions in regulating the actin filament turnover and cell adhesion. We further identify CDK5 (Cyclin-Dependent Kinase 5) as a kinase that phosphorylates both the Ser307 and Ser309 residues. On the other hand, the cAMP signaling induces CAP1 dephosphorylation at the site, mediated by both cAMP effectors PKA (Protein Kinase A) and Epac. These novel findings substantially extend our knowledge on regulation of CAP1 that will help better understand roles in human cancers.
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FLORAL DIP TRANSFORMATION OF CAMELINA SATIVA L. WITH A MYO-INOSITOL OXYGENASE GENE TO POTENTIALLY IMPROVE OIL YIELD

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Camelina sativa L. has potential to produce edible oils, livestock feed, biodiesel and feedstock for jet fuel production. This species has potential as an alternative winter oilseed crop. Agrobacterium-mediated floral dip transformation of Camelina to transfer the AtMIOX4 gene (myo-inositol oxygenase from Arabidopsis thaliana) was carried to improve seed yield, seed size and oil yield. Three Agrobacterium strains LBA4404, GV3101 and EHA105 were used to transform Camelina sativa cultivar 'Celine'. An average of 10.15 percent transgenic seeds were obtained from the 2 percent of seeds screened on antibiotics, which yielded 13.63 percent (LBA4404), 5.36 percent (GV3101) and 12.5 percent (EHA105) of positive transformants. A direct PCR analysis for the AtMIOX4 insertion was used to screen the putative transgenic plants giving 10 percent positive transformants from antibiotic-screened plants, for an overall frequency of confirmed transformants of 0.21 percent. The positive transformant lines had up to three times as much foliar ascorbate content compared to the wild type, indicating a phenotypic alteration. Development of first sexual generation from the transformant lines in the green house was achieved. This work provides an effective yet simple method to introduce new genes into this promising bioenergy crop, to help improve agronomic characteristics.
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PRESCHOOL PHYSICAL EDUCATION CURRICULUM DEVELOPMENT

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Physical education class is important for children of all ages, but critical for children ages 2-5 for establishing healthy habits for physical activity (PA). Since preschools and daycares serve 60 percent of children ages 3-5, intervening in such programs could provide chances to greatly impact the lives of youth by granting access to healthy lifestyles at young ages and promoting healthy behaviors later in life. As Arkansas is first in the nation for adult inactivity, it is essential to offer positive PA experiences that some children may not receive at home. To understand where physical education content should be aimed for preschool age children, data was collected with the Test of Gross Motor Development and Perceived Movement Skill Competence instruments for fundamental motor skill competence and perceived competence respectively. Creation of a curriculum to draw student interest through themes and intriguing games that make learning and skill development fun was conducted and the intended outcome of the current study. Since research is ongoing, results have yet to be established. Intended results include preschool curriculum and assessment that can be used by trained preschool classroom teachers with fidelity.
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COPD

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Chronic obstructive pulmonary disease is a preventable and treatable disease but a major public health challenge due to high rates of morbidity and mortality. Acute exacerbations increase these rates. Identifying and reducing exacerbating factors, such as viral infections can reduce these episodes. Influenza continues to increase in prevalence, resulting in high levels of illness and hospitalization rates. Patients with chronic health conditions can suffer more serious medical consequences if they contract influenza. Vaccination of influenza is an effective and simple preventative strategy recommended in the GOLD guidelines. There is not a 100 percent compliance in primary care facilities. The purpose of this study is to determine the rate of compliance in administering the flu vaccine to chronic obstructive pulmonary disease patients in a rural family clinic by conducting a quantitative retrospective chart review. A list of patients with J44.9 diagnosis was generated by the office manager. One hundred charts were randomly selected and assessed for flu vaccine administration for 2017-2018 flu season. Clinic had 71 percent compliance rate.
Mentor: Dr. Lisa Waggoner, lwaggoner@AState.edu

ELICITATION AND PURIFICATION OF PRENYLATED STILBENOIDS FROM HAIRY ROOT CULTURES OF PEANUT

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Stilbenoids are natural products that have shown anticancer and anti-obesity properties. Peanut (Arachis hypogaea) is able to produce these compounds as phytoalexins, protecting it against fungal pathogens. Hairy roots of peanut produced via Agrobacterium rhizogenes-mediated transformation have the ability to produce stilbenoids when exposed to elicitors or stress inducing compounds. In this project, peanut hairy root cultures were co-treated with the elicitors methyl jasmonate, cyclodextrin, hydrogen peroxide and magnesium chloride to activate the biosynthesis of stilbenoids. After several hours of elicitation, stilbenoids were extracted from the culture medium with ethyl acetate and the extracts were analyzed by high performance liquid chromatography (HPLC). The analyses showed that the extracts contained the non prenylated stilbenoids resveratrol and piceatannol and prenylated stilbenoids arachidin-1, arachidin-2, arachidin-3 and arachidin-5. In addition, several other unknown compounds were also present in the extracts. In order to study the biological activity of the prenylated stilbenoids, the extracts are being separated by semi-preparative HPLC. This study will provide a platform to identify to novel natural products with potential applications in human health.
Mentor: Fabricio Medina-Bolivar, fmedinabolivar@AState.edu

DEVELOPMENT OF A PROGRAMMABLE LOGIC CONTROLLERS TRAINER FOR INDUSTRIAL PROJECT SIMULATION

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Programmable Logic Controllers (PLC) are widely adopted in industrial automation and are programmed using an application named RSLogix500. PLCs are mostly used in industrial processes, and thus require a knowledge on how to use them. The proposed PLC trainer is a cost-effective trainer designed to provide necessary knowledge about how to program a PLC. It also provides students with hands-on experience on how to use a PLC. The purpose behind building a PLC trainer is to provide the engineering faculty with a trainer cheaper than marketed ones that is more effective. The proposed model is equipped with roughly 30 exercises, with the level of difficulty increasing with each one. Furthermore, the exercises will be provided to the user with detailed instructions. Overall, it simulates four industrial processes including a conveyor process, a heating and cooling operation, a balancing process and an actuator operation. The industrial processes are simulated by building a trainer, first by 3D designing then building a support and buying the necessary components needed for the simulations; such as motors, fans, conveyors and lights. The components are to be mounted on acrylic glass then on the PLC trainer and finally connected to the MicroLogix 1000 Series PLC.
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CONSUMPTION OF A VEGAN DIET: PROVIDES ADEQUATE IRON INTAKE TO PREVENT IRON DEFICIENCY AND ANEMIA

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This research is designed to find out if a vegan diet is nutritionally adequate for optimal iron intake in teenager ages 14-18 years old. Different people consume different types of food to obtain adequate iron intake. A frequently used nutritional science textbook, Nutrition Through the Lifestyle, states that iron deficiency is the number one deficiency in the United States. However, iron deficiency occurs in no more than 7 percent of older children and in no more than 1 percent of teenage boys and young men. Our research will illustrate a vegan diet is sufficient to prevent iron deficiency and it is possible for vegans to obtain the proper amounts of iron through a 100 percent plant-based diet. Being a part of this research project has made me aware of the lack of deficits that people consuming a vegan diet can face if unaware or uneducated on a proper vegan diet. It has also allowed me to learn how to find what their plant based food options are, regarding iron consumption, through the testing of several recipes.
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PROJECT MACROINVERT: BRINGING MAYFLY (EPHEMEROPTERA) COLLECTIONS OUT OF THE DARK AT ARKANSAS STATE UNIVERSITY

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The Arkansas State University Museum of Zoology (ASUMZ) Aquatic Macroinvertebrate collection at the Arkansas Center for Biodiversity Collections (ACBC) houses approximately 130,000 specimens (17,000 lots) collected by George L. Harp and his students from the early 1970s to his retirement in 1999. Since then, the collection has been stored and not well curated. In fall of 2016, Project Macroinvert officially began with the overarching task of restoring, databasing and georeferencing the collection. As a part of Project Macroinvert, field notebooks containing the only record of specimen data were imaged and specimen data was digitally databased and georeferenced. This project focuses on ASUMZ Mayfly collection data that may be of particular interest to aquatic biologists in Arkansas and the southeastern United States due to the significance of Mayflies as indicators of stream health. We began by making an annotated checklist of each specimen of Mayfly that was recorded as being present in Arkansas, of the 118 species of Mayfly that are known to be distributed in the southeastern United States. We then mapped and described the distributional data of the ASUMZ Mayfly collections, breaking down our findings by abundance of Mayfly specimens per each major Arkansas County.
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READING INSTRUCTION FOR ENGLISH LANGUAGE LEARNERS: TAILORING INSTRUCTION FOR SECONDARY STUDENTS

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Teaching English Language Learners (ELL) a second language has been a task our schools have been faced with for generations. However, many of the reading instruction programs that are used to teach these students were created for primary students and do not appeal to secondary students. In a study by Shim and Shur (2018), it was determined that ELL students feel the content is not geared toward high school students, teachers treat them as if they know nothing, and teachers do not care for them as individuals. Pairing reading instruction methods with contemporary topics and pop culture references will better engage students and provide direct instruction in literacy. This proposed study should show that a higher level of student engagement with the content leads to higher proficiency on fluency exams such as the ELPA21. As students become more involved in the curriculum, they will be more likely to retain knowledge and build fluency resulting in more positive views of school and teachers overall. Identifying strategies to help secondary ELL students succeed would allow for curriculum planning that builds fluency across all disciplines and helps ELL students become more academically on par with their peers. This study is ongoing and findings are not yet available.
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BATTERY LEVEL INDICATOR

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This project aims to design a Battery Level Indicator. A battery level indicator is capable of showing 10 different levels of battery voltage depending on the battery life. It requires components like LM3914 IC, LEDs, a switch, resistors, potentiometer, and a 12V battery. The LEDs are utilized to display different voltage levels of the battery. The IC regulates the current, while the resistors control the brightness of the LEDs. The LEDs light up in an inclusive fashion for a range of 1.2V to 12V. Each level increments 1.2V, modeling the percentage of the expected battery voltage. The circuit may be further modified to measure higher maximum voltage levels and change the resolution to accommodate more levels of the battery. These levels also indicate the percentages for the changed voltage. This is currently being used in cases where overcharging can cause the battery to overheat or explode. Battery level indicators have also become a part of electronics, enabling the user to know the battery percentage without the use of LEDs.
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DISCUSSION AND BILLING OF ADVANCE DIRECTIVES IN PRIMARY CARE PATIENTS WITH MEDICARE

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In patients 65 years and older with Medicare, advanced care planning services may be billed separately in addition to the annual wellness visit; therefore, when this is not discussed, the practice has potentially lost revenue that could have otherwise been collected at the time of service. Advance Directives (ADs) are written documents that specify a patient's healthcare preferences if and when the time comes that they are unable to make their own medical decisions. Unfortunately, AD completion rates in the primary care setting are alarmingly low. Splendore and Grant (2017) reported AD completion rates of only 5-39 percent. The purpose of this study is to evaluate the amount of revenue that is being lost when primary care providers omit discussion of advance care planning during an annual wellness visit. The study encompasses a retrospective chart review at a primary healthcare clinic in Paragould, Ark. The patient charts reviewed were those of patients 65 years and older with Medicare. The results are currently pending. CPT codes are codes used for billing various healthcare services. The predicted results are to be extremely low billing and coding rates for CPT codes 99497 and 99498.
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CALCIUM VERSUS BISPHOSPHONATE TREATMENT FOR OSTEOPEROSIS IN POSTMENOPAUSAL WOMEN

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Osteoporosis causes bone deterioration, leaving them weak and fragile. Osteoporosis is the leading cause of hip fractures in postmenopausal women because hormone levels decrease with age leaving bones weak. Twenty percent of senior adults die within one year following a fracture. Therefore, comparing options is vital to maintaining bone strength. The United States Preventative Service Task Force recommends 1200mg of calcium in postmenopausal women. The study is designed to determine if a rural clinic in Arkansas is providing the best treatment for osteoporosis in women 65 years to 90 years of age. A retrospective chart review was performed on post-menopausal women 65 years to 90 years of age to evaluate the incidence of fractures while taking calcium versus bisphosphonates. Inclusion criteria is women ages 65 to 90 taking either calcium or bisphosphonates with a fracture occurring between April 1, 2017 and Nov. 4, 2018. Exclusion criteria is women taking other osteoporosis medications, women taking calcium and bisphosphonates, women younger than 65 and older than 90, and fractures occurring prior to April 1, 2017 and after Nov. 4, 2018. The results of this study are inconclusive due to no fractures reported from April 1, 2017 to Nov. 4, 2018.
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A LOCAL FAMILY CLINIC'S TREATEMENT RATE FOR TREATING HYPERLIPIDEMIA IN DIABETIC PATIENTS ACCORDING TO 2018 ACC/AHA GUIDELINES

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Diabetes can strike and affect anyone, from any walk of life. Diabetes is the leading cause of blindness, kidney failure, amputations, heart attacks and stroke due to many associated comorbidities. These comorbidities include hypertension, dyslipidemia, coronary heart disease (CAD) and other systemic complications. Recent data has suggested that cholesterol management through statin therapy incorporated in the treatment plan of diabetics may reduce comorbidities such as CAD. The purpose of this study is to examine the low-density lipoprotein (LDL) levels in patients with diabetes to determine the percentage of patients who were treated with statin therapy according to the American College of Cardiology and American Heart Association (ACC/AHA) cholesterol treatment guidelines. The research study was conducted using a retrospective chart review at a local family practice clinic in Paragould, Ark. The data collection showed the percentage of adherence to the guidelines was 46.25 percent matching previous studies. Determining compliance rates of providers in the treatment of LDL in diabetic patients will provide the healthcare providers an opportunity to determine if a change in their practice is warranted to improve adherence to cholesterol treatment guidelines.
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ARE PATIENTS WITH ERECTILE DYSFUNCTION RECEIVING FIRST-LINE MEDICATION?

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Erectile dysfunction (ED) is mistakenly thought to be part of the normal aging process for men; however, it is usually the result of a medical condition or a side effect of medication. ED impacts a large population of males from ages 40 and above. First-line medication treatment for ED is a PDE5 inhibitor. The purpose of this study is to determine what percentage of patients with a diagnosis of ED are being prescribed the recommended medication. While working in a family practice clinic, an APRN may be met with males, or their significant others, requesting treatment for sexual dysfunction, especially ED. It is important to the APRN discipline to be knowledgeable of all available treatment options. The study consists of a retrospective chart review at one Arkansas rural clinic. Charts reviewed were of males, 40-64 years, with erectile dysfunction. Of the 75 charts reviewed, 25.3 percent (n=19) of patients were prescribed a PDE5 inhibitor. Of those receiving the PDE5 inhibitor, 47.3 percent (n=9) were prescribed a dose less than recommended by guidelines.
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EFFECTS OF EXTERNAL LOADING DURING DAILY LIVING ON ANAEROBIC PERFORMANCE: A REVIEW

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Hypergravity training involves wearing a weighted vest during training sessions and activities of daily living. Early literature reported vast improvements in vertical jump height and average power during 15 seconds of continuous jumping after three weeks of hypergravity training. However, wearing an external load during training may increase the risk of musculoskeletal injuries or alter kinematic running patterns. As a result, more recent research has focused on using external loads during daily living (ELDL) only. Therefore, the purpose of this review was to evaluate studies that examined the effects of ELDL on anaerobic performances. Articles were located using Google Scholar databases. Inclusion criteria consisted of physically active samples of adults or athletes with extensive training experience. Studies that included the use of external loads during training were excluded from this review. The body of literature investigating the effects of ELDL provide evidence suggesting that three weeks of wearing a weighted vest for 32 hours per week during activities of daily living can lead to significant improvements in sprinting tasks. Additionally, ELDL may improve performance of military tasks under load, such as stair climbs and cover-to-cover sprints.
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DISCUSSION OF ADVANCE DIRECTIVES IN PRIMARY CARE

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In the primary care setting, there is an expected deficit in the discussion and completion of advance directives (ADs) in patients ages 65 and over. Not only is the discussion of ADs important for the patient to alleviate suffering, improve quality of life and support decision making in end-of-life care, Medicare and Medicaid Services (Medicare.gov, 2018) reimburse clinicians for documentation of the discussion of ADs, which can benefit the clinician and area of practice. The purpose of this quality improvement project was to evaluate the documentation of discussion between patient and provider regarding ADs during clinic visits with Medicare patients ages 65 and over. The retrospective chart review occurred in a rural primary care clinic in Southeast Arkansas. Clinic visits occurred from August to November of 2018. Data collection and analysis revealed that 8 percent of Medicare visits included discussion of ADs. The inclusion criteria involved any Medicare patient >/= 65 years of age, male or female. The exclusion criteria included any patient < 65 years of age or with an insurance carrier other than Medicare. This quality improvement project provided information on the completion of ADs in the primary care setting with awareness brought to the potential lack thereof.
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A LOOK AT THE RATE OF PROVIDER ADHERENCE TO THE RECOMMENDATIONS OF DIABETIC FOOT EXAMS IN A NORTH CENTRAL ARKANSAS PRIMARY CARE CLINIC

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Diabetes is a chronic disease that affects approximately 422 million lives worldwide (WHO, 2017). The annual incidence of foot ulcers in patients with diabetes is estimated to be around 6 percent, and 84 percent of lower limb amputations are patients with diabetes (Rice et al., 2014). Recommendations in the prevention of foot complications include every patient with the diagnosis of diabetes receive an annual diabetic foot exam (American Diabetes Association, 2017). The purpose of this study is to compare the percentage of patients with a diagnosis of diabetes in a local primary care clinic who receives diabetic foot exams to state averages and Healthy People 2020 targets. Data was obtained through a retrospective chart review of records between Feb. 1, 2018 through Nov. 1, 2018. Inclusion criteria are adults 40-80 years old with the diagnosis of diabetes. Exclusion criteria was anyone < 40-years old or no diagnosis of diabetes. Thirty-five charts were randomly selected from a report generated from the electronic health record of patients with the diagnosis of diabetes. The information was shared with the practice site to assist in the clinic's efforts for quality improvement. Data collection is ongoing, and analysis is pending.
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ASSESSMENT OF SEASONAL AND AGRICULTURAL IMPACTS OF WATER QUALITY IN BAYOU DEVIEW WATERSHED, ARKANSAS

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Bayou DeView Watershed, a tributary of the Cache River located in northeastern Arkansas, provides a variety of important ecosystem services. These services include water regulation and supply, erosion control, nutrient and waste cycling, aesthetic and recreational values. Impairment can result in decreased biodiversity, hypoxic zones and loss of ecosystem function. Bayou DeView is characterized as a channel-altered Delta Ecoregion stream. Channel modification increases total suspended solids, nutrient run-off and alters diversity of flora and aquatic fauna. Possessing a high diversity of pollutant tolerant aquatic organisms, Bayou DeView offers near permanent surface water habitat and agricultural irrigation supply. Seven sites selected within Bayou DeView Watershed were sampled weekly for physiochemical and nutrient water parameters. Analysis of parameters were performed as a function of monitoring site, season, agricultural cropland percentage, stream order and discharge. Physiochemical parameters were significantly different among sites. Physiochemical parameters were significantly different among sites and season. Agricultural cropland percentage and stream order did not significantly differ impairment parameters among stream sites suggesting other parameters as more important indicators of stream health. Continued consistent monitoring and assessment of surface water in Bayou DeView Watershed is vital in preserving ecosystem services and assist in the implementation of best management practices.
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OPTIMIZATION OF THE ELICITOR TREATMENT IN HAIRY ROOT CULTURES OF PEANUT FOR THE PRODUCTION OF BIOACTIVE STILBENOIDS

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Stilbenoids are a class of plant natural products known for their antioxidant and anticancer properties. In order to produce stilbenoids, a bioproduction system using peanut hairy roots co-treated with the inducers or elicitors methyl jasmonate (MeJA), hydrogen peroxide, cyclodextrin (CD) and magnesium chloride was established in the Medina-Bolivar laboratory. To optimize the production of stilbenoids, this research studied the effect of doubling the concentration of MeJA and hydrogen peroxide, and increasing the concentration of CD in increments of 9 g/L. Doubling the concentration of MeJA caused a significant increase in some stilbenoids. Whereas increasing the concentration of CD to 36 g/L led to 3-fold increased levels of selected stilbenoids. Doubling the concentration hydrogen peroxide led to increased levels of unidentified compounds which are presumably oligomeric stilbenoids. This study concludes that there is still opportunity to increase stilbenoid yields by modifying the elicitor treatment. Future experiments will combine two optimal concentrations of elicitors to determine if the effects are additive.
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GEOREFERENCING THE DRAGONFLY (ORDER: ODONATA) COLLECTION CATALOGED IN THE ARKANSAS STATE UNIVERSITY MUSEUM OF ZOOLOGY

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The Arkansas State University Museum of Zoology (ASUMZ) Aquatic Macroinvertebrate collection at the Arkansas Center for Biodiversity Collections (ACBC) houses approximately 130,000 specimens (17,000 lots). Most of the specimens were collected in Arkansas, but coverage includes North and Central America, and Australia. Project Macroinvert was initiated at the ACBC in fall of 2016, which involves restoration, digitization and georeferencing of the collection. Until recently, specimen data were stored in handwritten catalogs, making query and locality mapping cumbersome and time consuming. Upon completion, these geospatial data will provide a very high-resolution picture of distributional patterns of aquatic macroinvertebrate taxa on smaller scales. This project focuses on Odonate collection data unlocked by Project Macroinvert. Specifically, ASUMZ Odonate collections were mapped and distributional patterns were compared to previous studies of Odonates within the regional footprint of ASUMZ collections. A comprehensive list of the identified Odonate species within this collection can be combined with previous records. We expect that digitization and georeferencing of small collections, such as the ASUMZ collection, will contribute vastly to our knowledge of species distributions and our ability to accurately characterize biodiversity at fine scales.
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BRINGING THE FLAVOR OF GREECE INTO A HEALTH-CONSCIOUS COMMUNITY

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My product, a dessert based on the conventional flavors of Greece, is tested to determine which combination of flavors is most embraced in the available public. Many people look for new ideas and new flavors to incorporate into their typical eating patterns, with a focus on healthier alternatives. The typical cuisine in Greece has a range of flavors that are locally available in this area and contains ingredients that are considered a part of the Mediterranean Diet. The Academy of Nutrition and Dietetics recognizes this diet as having many health benefits for the general public. This new product is created then tested among individuals, being analyzed on appeal, aroma, taste and texture. Results from the first test are analyzed to create a second product, similar to the first, with more appeal. The final product will represent a new, attractive option for the health-conscious public, utilizing resources that are readily available and with simple preparation.
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DIABETES AND EXERCISE: IMPROVING PATIENT OUTCOMES

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Diabetes affects approximately 363,781 people in Arkansas. Regular activity is a vital part of managing diabetes. Exercise is best paired with proper meal planning, taking medications and managing stress. Exercising consistently can lower blood glucose and improve an individual's hemoglobin A1c. The purpose of this project was to provide increased awareness of the connection between diabetes and regular physical activity. The secondary aim was to demonstrate purposeful activities participants could use for exercise. The project involved a pretest, an education intervention and a post-test. The results reflected an increase in the participant's knowledge after the intervention. Further investigation should include more participants.
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PICK AND PLACE ROBOTIC ARM

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In Introduction to Robotics Lab, the mechanical engineering students were given a task to create a pick and place robot. The students had to form groups, design, and fabricate a pick and place robot. The robot consist of three main human-like parts: the joints, the arms, and the gripper. The joints of the robot can be compared to the shoulder and elbow of a human. The arms of the robot can be compared to the area from the shoulder to elbow, and from the elbow to the wrist. The gripper of the robot can be compared to the hand. This project incorporates the use of a programmable logic controller to control the robot. The group used simple push buttons in conjunction with the PLC to control the robotic arm. The group's main problem was figuring out how to wire all the electrical components correctly. Since the group had little to no exposure to electrical wiring, the students reached out to electrical professor and students for help. The project was very successful and resulted in a functioning pick and place robot.
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PMC SHAKER TOWER

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In Process, Monitoring, and Control, the students were required to complete three experiments that incorporated various "orders" of differential equations. After completing all three experiments, the students were tasked with creating their own fourth experiment. The fourth experiment that was created by the group was a five-story shaker tower. The goal of this experiment was to create and test how adding different spring-mass systems affects different stories of the five-story shaker tower. After creating the tower using 3-D printers, the group had to find the first three natural frequencies, or mode shapes, of the shaker tower. To do this, the group used a function generator, power amplifier, and a shaker motor. After finding the three natural frequencies, the group had to use theory learned from class to find what mass would cause the tower to stop shaking.
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3D PRINTING TECHNOLOGY WITH TWO PHOTON LITHOGRAPHY

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3D printing on the microscale sounds like something out of science fiction, but with modern day innovations and techniques it is real. Introducing 3D printers that utilize two photon polymerization (TPP), one can print detailed models of cathedrals and place them upon human hairs. With the main objective of facilitating this TPP 3D printer in the A-State campus, the principles behind TPP method are explained here using specific topics from physics such as optics. Designed work by two engineering students using solid modeling for optical elements such as a femtosecond laser and high resolution of stage are also presented in terms of low-cost fabrication. Facilitating TPP printer using a pulsed near infrared laser to trigger polymerization of a liquid formulation in A-State will contribute to the development of interdisciplinary applications such as, biomedical engineering, optoelectronics, and photonic micro-mechanical devices. Given considerable time spent on research and design of this research, there are few results in fabrication as of now, however, quick fabrication is to be realized shortly.
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USING MUSIC DURING TRANSITIONS

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Transitioning takes up a large portion of kindergarteners' day. Transitions can either be beneficial or detrimental to the students' routine, academics and behavior. Register and Humpal (2007) suggest that if beginning readers are exposed to music during school times such as transitions, it can enhance the development of their literacy skills. However, traditional transitions that lack music increase opportunities for behavior issues and loss of instructional time. This study will examine the impact of musical transitions on instructional time, provided opportunities for students to develop musical and literacy skills, and be engaged in physical activity. The purpose of this study is to examine the potential benefits of utilizing music during transitions in a kindergarten classroom, as compared to traditional transitions without music. A stopwatch will be used during both tradition and musical transitions. A short student interview will be conducted with each kindergartener to indicate whether or not a musical transition is motivating and preferred. The results will be analyzed to see if there are musical and literacy benefits from transitioning with music.
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EFFECTS OF THE AMOUNT OF EGGS IN A DESSERT

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Our research is designed to determine the best variation of a dessert recipe that utilizes flavors from foreign countries to feed a family of 6-8. I will utilize the Brazilian fruits, mango and passion fruit, to create a tart dessert. The original recipe will be tested and then evaluated to see the possible changes to the amount of eggs in the tart. With these changes, I will create an improved recipe. Research will be conducted by using a focus group to evaluate the two variations. Each variation will be labeled to conceal the original and the variation to blind the participants from the identity of the original and modified recipe. For this research, a hedonic scale will be used as a system for ranking the two on categories of taste, texture, smell, appearance, firmness and overall.
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STUDENT READING PROFICIENCY

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Student reading proficiency has declined over the years. In schools where approximately, eighty-four percent of third through fifth grade students are reading below grade level, it is cause for concern. National research (Kerns and Bryan2018), reports that proficient third grade readers are five times more likely to graduate than below-basic third grade readers. The epistemological approach for this study is based on a pragmatism prospective. It relies on data generated from the participants that will test the effectiveness of instructional methods. This study will determine if student reading proficiency can be increased one grade level by the end of the school year, if Tier 2 instruction, and Lexia Core 5, are aligned with Tier 1 instruction, and taught with fidelity. Information from the Foundational Skills Survey, STAR Reading Assessment, Dibels, and Lexia Placement will serve as beginning of the year data, to establish benchmarks and intervention needs of students. Pre/post assessments, NWEA interims, informal observations and anecdotal notes will be used to assess student reading progress. Results from this study may possibly assist educators in effectively using data to drive instruction, and help them to develop meaningful, personalized, learning plans that will meet the needs of each student, and improve their reading abilities.
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TAXONOMIC EVALUATION OF THE GOLDSTRIPE DARTER, ETHEOSTOMA PARVIPINNE

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The Goldstripe Darter, Etheostoma parvipinne, inhabits shallow spring-fed streams in the Gulf Coastal Plain from the Colorado River drainage in Texas to the Altamaha River drainage in Georgia. A previous morphological study identified slight differences in far western populations from E. parvipinne, but few differences were found among population separated by major river drainages , a pattern often seen in darter species. The objective of this study was to evaluate molecular variation and phylogeographic patterns in E. parvipinne across its range using a combination of mitochondrial (mt) and nuclear (n) DNA sequence data. Results from phylogeographic analysis of one mtDNA and one nDNA marker revealed a deep phylogenetic rift for E. parvipinne populations east and west of the Mississippi River resulting in two separate clades. Mitochondrial DNA data and novel nuclear DNA markers are being added to the preliminary data, with the objective of providing finer resolution of the phylogenetic disconnection between populations east and west of the Mississippi River. Additional sampling of individuals and molecular markers, meristic and morphometric analyses, and species delimitation methods will be used to further clarify the divide between the east and west clades within the species.
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COMPARING THE BENEFITS OF LLLT AND DIETARY SUPPLEMENTATION FOR MUSCLE RECOVERY POST FATIGUING EXERCISE

Taylor Wilkes – Graduate
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Multiple studies have been conducted to examine the effects of Low Level Light Therapy (LLLT) on muscle performance, fatigue, and recovery. Phototherapy has been demonstrated to provide a prophylactic effect to tissue by limiting exercise-induced cellular damage. By limiting cellular damage, improvements in recovery of muscle strength and function post-exercise can occur. Evidence also exists that dietary supplements have a beneficial effect on muscle performance. Specifically, Montmorency tart cherries have been shown, if ingested before a fatiguing bout of exercise, to decrease discomfort experienced post-exercise. Though studies about LLLT and dietary supplements have been conducted, no research has compared their relative benefits in terms of recovery from fatigue, nor has their potential as a combination treatment been explored. Using the Wingate Anaerobic test we will investigate which intervention is more efficient for the clearance of lactate. Lactate clearance is the most commonly measured physiologic parameter associated with exercise testing. We hypothesize that participants who receive either LLLT or dietary supplementation will recover from fatigue more rapidly. We also hypothesize that the two interventions together will provide an improved outcome over each individually.
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ASSESSING THE IMMUNE MODULATING EFFECTS OF PLANT-MADE CATFISH INTERLEUKIN-22

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One of the main issues facing the aquaculture industry today is the antibiotic resistance epidemic which occurs from the frequent use of antibiotics to treat fish disease. As it stands for channel catfish, preventing disease falls on two FDA approved antibiotics; the industry needs an alternative. Human Interleukin-22 has been extensively studied and has been shown to upregulate an important immune cascade in humans. It is hypothesized that catfish share a similar immune cascade and taking advantage of this immune response may be useful in disease prevention. The Dolan Lab has successfully expressed a recombinant catfish interleukin-22 (cfIL-22) using a plant expression platform. The purpose of this thesis is to expand upon and optimize a bioassay to directly measure the ability of recombinant cfIL-22 to induce the production of antimicrobial peptides in channel catfish ovarian (CCO) cells. Flow cytometry in conjunction with a fluorescent-labeled infectious bacterial catfish pathogen will be used to determine bacterial invasion and adherence against CCO cells. These technologies will be used to determine if cfIL-22 has the capabilities to significantly reduce adherence and invasion of an important catfish pathogen. This bioassay protocol can be applied to test other possible emerging antimicrobial therapeutic agents.
Mentor: Maureen Dolan, mdolan@AState.edu

ARE WOMEN AGES 40 TO 64 IN A LOCAL HEALTH CLINIC BEING REFERRED FOR MAMMOGRAPHY AS RECOMMENDED BY CLINICAL GUIDELINES SET BY THE ACS AND HOW DO RATES COMPARE TO THE NATIONAL AVERAGE OF 64.8 PERCENT?

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In Arkansas, over 2,000 women were diagnosed with breast cancer in 2013 and nearly 400 women died from the disease. The purpose of this retrospective quality improvement project is to determine if a rural health clinic in Walnut Ridge, Ark., is following the American Cancer Society (ACS) guidelines for mammogram referral that recommends annual mammograms for women ages 40 to 64 years. The idea of this project is to increase the clinician's awareness of ACS guidelines, to increase the rates of mammogram screenings in a rural clinic and help close the educational gap related to cancer screening recommendations. The information was obtained by a retrospective review of 100 charts between the dates of Nov. 1, 2017, and Nov. 1, 2018. Those excluded from the study were men, women under 40 years old, women over 64 years old, and children. The clinic average annual referral rate was 47 percent compared to the national average of 64.8 percent.
Mentor: Ottysha Hadley, FNP-BC, ohadley@AState.edu

PAIN NEUROSCIENCE EDUCATION FOR PHYSICAL AND OCCUPATIONAL THERAPY STUDENTS

Holly Wilmarth – Graduate
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Current physical therapy curricula may not adequately address pain education. Pain Neuroscience Education "PNE" is an education tool that focuses on the influence of psycho-social pain triggers to help the patient gain better understanding of the pain experience. PNE is a potentially effective pain management intervention for sufferers of chronic pain. This research explored whether a single lecture/demonstration could produce evidence of enhanced understanding among PTA and DPT students regarding chronic pain. We delivered a 45-minute lecture explaining PNE. We administered the Neuroscience Pain Questionnaire (NPQ) and Health Care Providers Pain and Impairment Relationship Scale (HC-Pairs) both pre and post lecture. NPQ evaluates the general biological knowledge of pain. The HC-Pairs evaluates clinician attitudes and beliefs towards patients with chronic pain. Case vignettes were administered to the graduate students to assess their ability to apply their understanding of PNE. There was a significant improvement in scores from pre to post NPQ (knowledge of pain) and HC-Pairs (attitudes and beliefs). The DPT students were able to apply their understanding of chronic pain to effectively respond to clinical scenarios with an average score of 80 percent correct on chronic pain clinical vignettes.
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A RETROSPECTIVE CHART REVIEW OF IMMUNICATION RATES IN COPD PATIENTS IN THE PRIMARY CARE SETTING

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Chronic Obstructive Pulmonary Disease (COPD), which includes chronic bronchitis and emphysema affects millions of Americans. It is the second-leading cause of disease-related death within the United States. In 2010, there was an estimated $50 billion spent on direct and indirect COPD health care cost (CDC, 2016). Influenza vaccinations can reduce health care cost, hospitalizations, and deaths. A retrospective chart review of 50 charts from a local clinic in Northeast Arkansas will be performed on all patients with the diagnosis of COPD to determine if influenza immunizations were offered or declined with a documented vaccine allergy. The purpose of the study is to compare COPD vaccination compliance rates of a local clinic with the 2016-2017 national average of 46.8 percent. The data collection is continuing with analysis pending.
Mentor: Ottysha Hadley, ohadley@AState.edu

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Presentation Winners

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SHOWCASE OF THE ARTS	STUDENT WINNER	FACULTY MENTOR	TITLE OF PRESENTATION
Creative Musical Performance	Parker Long	Timothy Crist	Elemental Ambience
Creative Theatrical Performance	Joshua Pryor	Marc Williams	*Hamlet* by William Shakespeare
Creative Visuals – Visual Arts	Justin Mohler	Katherine Baker	What Can Drawing Do For You?
Creative Visuals – Theatre (tie)	Zac Passmore	Claire Abernathy	Costume Design for Soft Animals
Creative Visuals – Theatre (tie)	Abby Cooper Courtney Light Precious McCullough Lauren Wilcox Hannah Martin Amy Faughn Michaela Partridge Claire Thomas Kennedy Woodall Katelyn Stanton	Claire Abernathy	The Eye-Nose-Mouth Connection: Creating Theatrical Animal Makeup Applications

ORAL PRESENTATIONS, UNDERGRADUATE	STUDENT WINNER	FACULTY MENTOR	TITLE OF PRESENTATION
College of Nursing & Health Professions	Brooks Propst	Susi Snellgrove	Sexual Assault and Emergency Department Nurses
College of Education & Behavioral Sciences	Bryston Hickman	Christopher Peters	The Effect of Judge Leadership Style on Jury Decision-Making
College of Liberal Arts & Communication – Humanities & Arts	Alexandra Borchardt	Bryan Moore	Spectrum: A Collection of Original Poetry Conveying Themes Expressed Through Color Symbolism in Literature
College of Liberal Arts & Communication – Communication & Media	Zoey Smith	Sarah Mayberry-Scott	"Pretty Hurts": How Societal Views Negatively Impact Women
College of Sciences & Mathematics	Dakota Dixon	Ross Carroll	High Altitude Balloon Flight Forecasting and Historical Analysis
Neil Griffin College of Business	Alex Gookin	Sarath Nonis	Online Media Usage of Arkansas State Students: Influence on Wellbeing, Motivation, and Learning
College of Engineering & Computer Science	Clayton Liddell	Donghoon Kim	Analyzing the Adoption Rate of Local Variable Type Inference in Opensource Java 10 Projects

ORAL PRESENTATIONS, GRADUATE	STUDENT WINNER	FACULTY MENTOR	TITLE OF PRESENTATION
College of Nursing & Health Professions	Nancy Baltz	Lisa Waggoner	Developing an Instrument to Assess Diabetes Related Knowledge, Attitudes, & Practices of Primary Providers Regarding Foot Pain
College of Education & Behavioral Sciences	Brianna Sayer	Veronika Pribyslavska	Effects of Foam Rolling for Delayed-Onset Muscle Soreness on Military Performance and Perceived Recovery
College of Liberal Arts & Communication	Oluwayinka Dada	Gil Fowler	A Thematic Analysis of How Achalasia Patients Receive Online Social Support
College of Sciences & Mathematics - (3 way tie)	Cristofer Clavo	Maureen Dolan	Hydroxyproline-O-Glycan Engineering in Tobacco Transient Protein Expression: Fish IL-22 and EGFP
College of Sciences & Mathematics - (3 way tie)	Patrick Roberto	Fabricio Medina-Bolivar	Enhanced Bioproduction of Selected Antioxidant Stilbenoids in Peanut Hairy Roots
College of Sciences & Mathematics - (3 way tie)	Abbas Karouni	Fabricio Medina-Bolivar	Production of Prenylated Stilbenoids in Cell Suspension Cultures of Peanut
College of Agriculture	Joshua Byrd	Elizabeth Hood	Plant-Produced Oxidation/Reduction Enzymes as Bioremediation Agents
College of Engineering & Computer Science	Tamal Sarkar	Brandon Kemp	Electrostatic Stability and Optical Tunability of Charged Particles in Inverted Systems: An Approach Towards Novel Tunable Surfaces

THROW 'EM TO THE WOLVES	STUDENT WINNER	FACULTY MENTOR	TITLE OF PITCH
Business Pitch	Hogan Sims Dailey	Hilary Schloemer	Eagle Rock Outfitters
Sales Pitch	Jenny Keller	Katerina Hill	

AMERICAN PHYSIOLOGICAL SOCIETY (PRESENTED BY APS)	STUDENT WINNER	FACULTY MENTOR	TITLE OF PITCH
APS Award	ChrisTina Okolo	Mohammad Alam	Synthesis and Antiproliferative Activity of Thiazolo-Androstenones Against Breast Cancer Cell Lines

POSTER PRESENTATIONS, UNDERGRADUATE	STUDENT WINNER	FACULTY MENTOR	TITLE OF PRESENTATION
College of Nursing & Health Professions	Braelen Hunt	Susan Motts	Nutritional Yeast as a Palatable Source of Vitamin B12 for Adolescents
College of Education & Behavioral Sciences	Kylie Brickey	Dixie Keys	The Forces of Connected Learning and Unit Development for Middle School
College of Liberal Arts & Communication	Mariah Dykes	Catherine Bahn	Baylor Sexual Assault Scandal: Crisis Communication and Brand Reputation
College of Sciences & Mathematics - (tie)	ChrisTina Okolo	Mohammad Alam	Synthesis and Antiproliferative Activity of Thiazolo-Androstenones Against Breast Cancer Cell Lines
College of Sciences & Mathematics - (tie)	Grant Dawson	Lorin Neuman-Lee	Helping the Herps: Restoring the Past for Arkansas State's Future
College of Agriculture	Jessica Krob	Tina Teague	Geospatial Variability and Cotton Production – Profitability in a Northeast Arkansas Field
College of Engineering & Computer Science	Rebecca Chen John Cottrell	Shivan Haran	Heat Transfer Analysis: Multi-Fin

POSTER PRESENTATIONS, GRADUATE	STUDENT WINNER	FACULTY MENTOR	TITLE OF PRESENTATION
College of Nursing & Health Professions - (tie)	Skyler Mankin	Christopher Jordan	Onset of Menses in Desha County Arkansas Versus the National Average of 12.8 Years
College of Nursing & Health Professions - (tie)	Samantha Cawyer Madison James Thomas Sustich	Susan Motts	The Relationship Between Chronic Low Back Pain and Inspiratory Abilities
College of Education & Behavioral Sciences	Katherine Shelton Garrett Tedford	Eric Scudamore	Effects of External Loading During Daily Living on Anaerobic Performance: A Review
College of Sciences & Mathematics	Brett Hale	Greg Phillips	Characterization of Microspore Embryogenesis in Soybean (Glycine Max)
College of Agriculture	Naina Rao Caroline Kelly Callie Phipps Brenna Cannon	Greg Phillips	Floral Dip Transformation of Camelina Sativa L. with a Myo-Inositol Oxygenase Gene to Potentially Improve Oil Yield
College of Engineering & Computer Science	Mdariful Hasan	Zahid Hossain	Neural Network Based Soil Resistivity Prediction for Arkansas

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