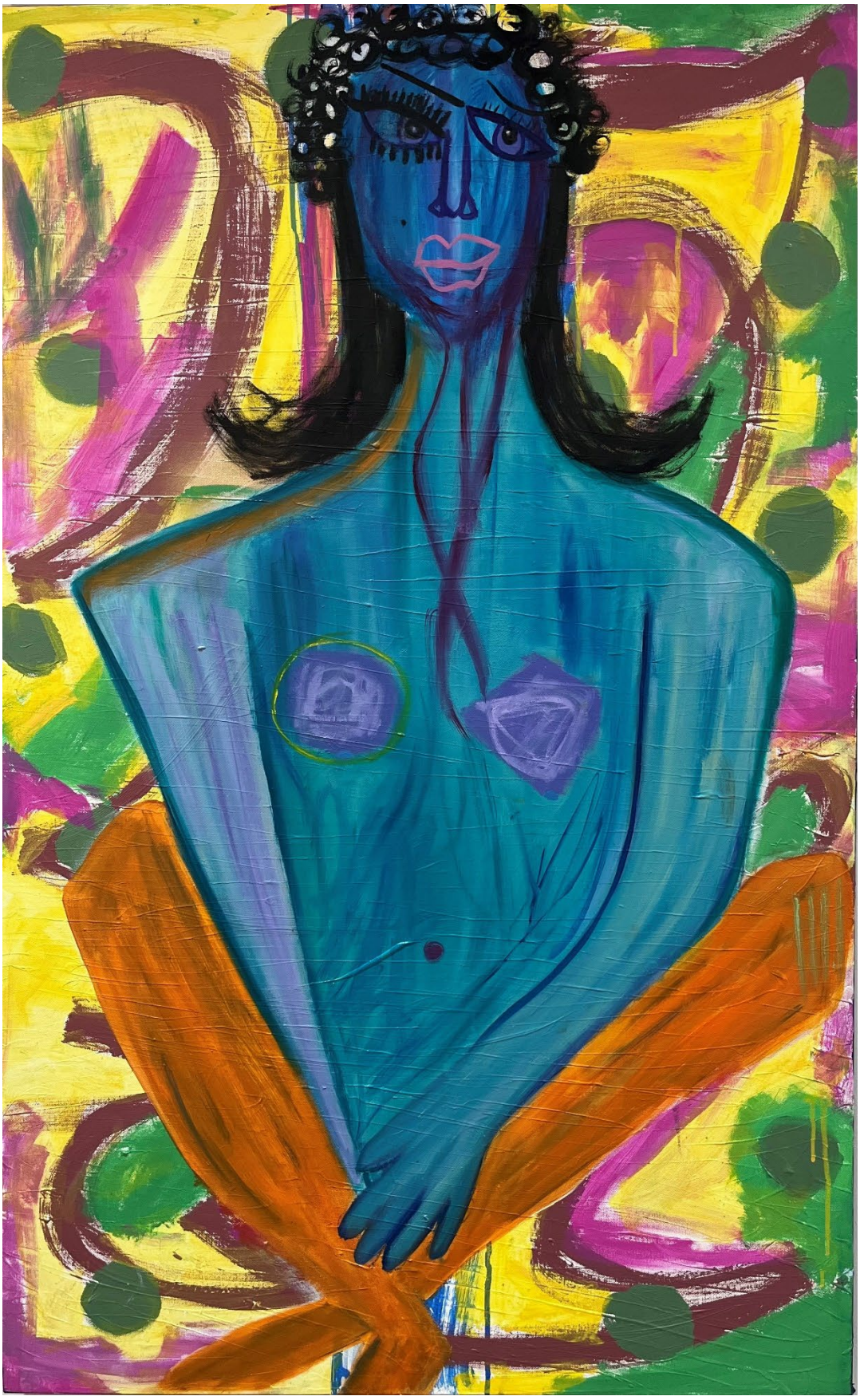
TEXAS WOMAN'S UNIVERSITY | APRIL 22 - 23

2025 Student Creative Arts & Research Symposium



2025 Student Creative Arts & Research Symposium

Welcome

Welcome to the **2025 Annual Student Creative Arts & Research Symposium**! For more than twenty years TWU has honored students, both artists and scholars, who have since gone on to fulfill the promise they first demonstrated at these Symposiums. These students have become researchers, teachers, artists, health care providers, and working professionals contributing to society and serving as positive role models as graduates of TWU. We are celebrating more than 20 years of meeting the following goals:

- Providing opportunities for all students to share their scholarly pursuits and build leadership and other professional skills, and
- Celebrating student-mentor achievements in a way that promotes a culture of scholarship and community at TWU.

We continue to offer various venues for presentations including poster and platform sessions and virtual presentations. Thank you for joining us in this joyous celebration of a culture of scholarship at the **2025 Annual Symposium**!

Acknowledgements

The involvement and support of many people and departments across campus make the 2025 Student Creative Arts & Research Symposium possible. The student presenters and mentors are thanked for their participation and congratulated on their accomplishments! All participating mentors and featured speakers are dedicated scholars who care about inspiring student researchers and artists.

The Student Symposium is fortunate to receive support from several sources this year to make the program a success. We are especially grateful for the generous support provided by the Office of Research and Sponsored Programs, the Center for Student Research and the Woodcock Institute. Many members of the University community graciously provided their time and expertise to support Symposium functions. We want to thank members of the Research Committee of the Graduate Council for the final selection of the Chancellor's Student Research Scholars and Graduate Council Awardees for Exceptional, Original Scholarship. Staff members in ORSP deserve special recognition for their extensive work to make this program a success.

The Annual Student Creative Arts & Research Symposium has received University-wide support. This celebration of student discovery and of scholarly discourse across disciplines is a part of TWU's rich academic tradition. Everyone's contributions are much appreciated!

Sharonza Penson, Cover Artist

A special thank you goes to this year's Symposium Program cover artist, Sharonza Penson. Sharonza is an abstract, interdisciplinary artist currently residing in McKinney, TX with an amazing son Elijah. With a B.A. in Journalism from Texas A&M University and a 17+ year career in marketing and graphic design, Sharonza has always been driven by creativity and is currently in her second-year as an MFA Visual Arts Candidate at TWU studying under Tanya Synar as her faculty advisor.

As a special needs mother, caregiver and artist, her art emerges from a daily walk of wearing multiple hats. She aims to create art that chronicles the unvarnished truths of this journey, revealing the messy, beautiful chaos that fill her days – from the darkest moments of isolation, to the most sublime moments of connection. Whether it's through installations or paint-swept canvases, she transforms both struggle and celebration into art that document trauma, as well as the deep resilience that grows alongside it.

The artwork that has been selected for the cover is titled, "It Started With A Blue Line." Part of Sharonza's (personal) art therapy and creative practice for the past few months has been to document the color that she's feeling. Whether it's every day, every other day, or every week – she has large canvases and canvas paper all over her home to express herself. This particular artwork, indeed started with a blue line. And then each day over a month it progressed to her adding another color - gold spray paint…muted rose…magenta and so on; until finally she ended up back to where she started with the blue line and painted a woman sitting still…contemplating. Blue is a color that is often associated with feelings of relaxation and calmness. The background represents the busy-ness of life, yet in the midst of it all, finding the moments to just sit still and remember the "blue line."

TWU Bettye Myers Butterfly Garden Photo Contest

Tuesday, April 22, 2025 (2:40 – 4:00 p.m.) and
Wednesday, April 23, 2025 (2:40 – 4:00 p.m.)

Student Union 2300 (Southwest Ballroom)

This photography contest is open to all current TWU students (division 1) and TWU faculty/staff (division 2). The subject matter must be The Dr. Bettye Myers Butterfly Garden (phase I or phase II). This contest is hosted by the Women in STEM Leadership program, The Dr. Bettye Myers Butterfly Garden Advisory Committee and the School of the Sciences. We are celebrating Texas Wildflower Day (Apr 26) as well as promoting community, mindfulness and well-being, as well as sharing the beauty of the butterfly gardens. All attendees of the symposium are welcome to view and submit a vote for your favorite photograph! Winners will be announced on Friday April 26 during the Texas Wildflower Day morning symposium with prizes being awarded to 1st, 2nd and 3rd places as well as a special prize, The Jeff Robb Prize, for capturing a pollinator in action.

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A Celebration of Research

Chancellor's Student Research Scholars
And
Graduate Council Awardees for Exceptional, Original Scholarship

Tuesday, April 22, 2025, 10:30 am – 12:00 pm
Student Union 2231

A special category of recognition, the Chancellor's Student Research Scholars, began in 2004. These student participants were nominated by their faculty mentors for exhibiting outstanding achievement in research or creative arts endeavors. Final selection of these scholars was made by the Research Committee of the Graduate Council. Scholars will be recognized and awarded individually at this session and will briefly share their research experiences.

Congratulations to our 2025 Honorees and their Faculty Mentors:

Doctoral Students

Alvis, Hunter (Kinesiology) ..... Dr. Brandon Rhett Rigby
Aschenberg, Lisa (Nutrition and Food Sciences - Denton)..... Dr. Shanil Juma
Bergman, Elizabeth M (Physical Therapy - Dallas)..... Dr. Sharon Wang-Price
Clark, Cayla E (Kinesiology) ..... Dr. Brandon Rhett Rigby
Crabtree, Keith E (Nutrition and Food Sciences - Denton) ..... Dr. Shanil Juma
Holder, Juliette (Language, Culture, and Gender Studies) .....Dr. Jacquelyn Hoermann-Elliott)
Mehebub, Md Shabab (Sciences – Biology).....Dr. Catalina Pislariu
Mori, Kanji (Kinesiology) ..... Dr. Young-Hoo Kwon
Olaoluwa, Temiloluwa Peace (Sciences – Biology) ..... Dr. Dayna Averitt

Masters Students

Islam, Bitali (Sciences – Biology) ..... Dr. Dayna Averitt

Undergraduate Students

Kashikar, Anaya (Kinesiology) ..... Dr. Kyle Biggerstaff
Perez Posada, Guadalupe (Sciences – Biology)..... Dr. Dayna Averitt
Preciado, Michael V (Nursing - Dallas)..... Dr. Jennifer Wilson
Schwickert, Maya M (Sciences – Chemistry and Biochemistry) .....Dr. Nasrin MirsalehKohan
Stankus, Matthew (Sciences – Chemistry and Biochemistry)..... Dr. Mary Anderson

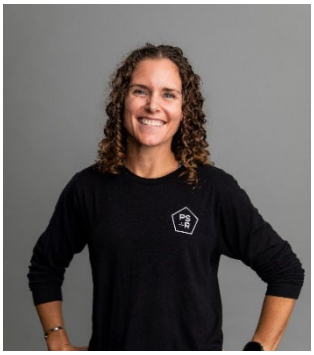
Graduate Council Award for Exceptional, Original Scholarship

Madeline Ratoza, Ph.D. Candidate in Physical Therapy
Katherine Mitchell, Ph.D. Candidate in Philosophy
Elizabeth Bergman, Ph.D. Candidate in Physical Therapy

These three students were selected by the Research Committee of the Graduate Council as recipients of the 2025 Graduate Council Award for Exceptional, Original Scholarship. Recipients receive a monetary award/scholarship and below is a summary of their research.

Madeline Ratoza, PT, DPT, is a PhD candidate in Physical Therapy whose research investigates geographic disparities in access to rehabilitation providers. Her dissertation focuses on mapping the distribution of physical and occupational therapists across Texas using spatial and statistical analysis, highlighting how access varies by socio-demographic need. This work is among the first to apply geospatial modeling techniques to rehabilitation provider availability, identifying underserved areas and providing evidence to support more equitable workforce policy. Madeline has published three peer-reviewed manuscripts during her doctoral studies and has received funding through the prestigious CoHSTAR program to support her dissertation research.

Katherine Mitchell is a doctoral candidate for a PhD in Literacy, Language and Culture in the College of Professional Education at Texas Woman's University. Her research interests include early literacy, early literacy interventions, the Science of Reading, and literacy education policy. Her dissertation research focus is on the effects of state level literacy mandates on teacher agency and self-efficacy and has been presented at state and national conferences. She has published two peer-reviewed manuscripts and received internal grants for her research. She has facilitated a workgroup studying research aligned with the Science of Reading and spoken on a panel about the impact of state level literacy mandates on teachers. Katherine believes that teacher's professional expertise should be recognized and state level literacy mandates should include input from educators. Katherine aims to undertake research that gives voice to teachers' experiences and highlights teacher expertise in literacy education.



Elizabeth (Libby) Bergman, PT, DPT, OCS, FAAOMPT is a physical therapist and PhD candidate in Physical Therapy graduating in August 2025. Her research focuses on the early identification and diagnosis of hip dysplasia in young adults with hip pain. Her scholarly agenda is focused on clinical predictors of hip joint morphology and the reliability of diagnostic assessments used in routine clinical practice to predict imaging findings in young adults with nonarthritic hip pain. Her research has been presented at national conferences and she was selected to speak at the American Physical Therapy Association national conference in 2025. She has three peer-reviewed publications through her PhD studies and has been funded through the Texas Physical Therapy Foundation

Keynote Speaker

Katherine Walker, PhD

Assistant Professor of English
University of Nevada, Las Vegas

The Alchemy of Ideas: Navigating the World of Interdisciplinary Research

Tuesday, April 22, 2025, 1:30 pm – 2:30 pm
Student Union 295 (Bridges Auditorium)

Katherine Walker is an Assistant Professor of English at the University of Nevada, Las Vegas. She works on the histories of magic, science, and drama, turning often to almanacs, demonology, and books of secrets in her research. Her book *Instinct, Knowledge and Occult Science on the Early Modern English Stage* is forthcoming with Edinburgh University Press. Walker is the author of *Shakespeare and Science: A Dictionary* (Bloomsbury 2021). She is co-editor with Sarah Dustagheer and Kirk Melnikoff of the forthcoming *Oxford Handbook to Christopher Marlowe*. In addition, her work appears in numerous journals and edited collections.

A Denton County native, Walker doubled-majored in English and Philosophy and was a Ronald E. McNair Scholar at the University of North Texas. She earned a master's degree in English at Texas Christian University. Walker earned her PhD from the University of North Carolina at Chapel Hill in 2018. After graduating from UNC, Walker was a visiting professor at Mount Holyoke College before joining the Department of English at UNLV. In Las Vegas, she teaches and researches on interdisciplinary topics, particularly the histories of magic and science alongside literature.

Walker focuses on the power of interdisciplinary research at the undergraduate level. She is a McNair Scholars Mentor and has advised many students in independent research projects featuring literature and astrology, mathematics, religion, and other topics. This emphasis is evident in her own scholarship on teaching first-generation scholars in a Shakespearean classroom.

ABSTRACTS FOR PLATFORM PRESENTATIONS

Abstracts are listed in the department of the faculty sponsor.

Session 1. Tuesday, April 22, 9:00 am – 10:20 am Track A (Student Union 2231)

1. NEW BEGINNINGS- LIFE AFTER CAREGIVING. J. Bookhart. Arts and Design – Visual Arts

Alzheimer's is often described as the longest goodbye. Caregivers to family members wake up knowing that there is no cure. Older Black Americans are twice as likely as older Whites to have Alzheimer's or another dementia (Centers for Disease Control and Prevention). Philosophers Rhonda Wilbon and Gaynell Simpson state that for women and their families to restore the caregiving role to a healthy level, men and others in the support network should share more responsibility in the process and challenge women to model healthier patterns of behavior for the next generation of African American families. My photographs showcase the aftermath of caregiving since my grandmother Mattie passed. I take the viewer on the journey with me and my family as we try to start a new chapter in our lives. My goal is to inform the viewer of the impacts of Alzheimer's on a family. (Faculty Sponsor: Dr. Sara Ishii)

2. THESE THINGS WILL CHANGE: PUBLIC REVISION AS FEMINIST RHETORICAL STRATEGY IN TAYLOR SWIFT'S RE-RECORDED ALBUMS. J. Holder. Language, Culture, and Gender Studies

Revision has the power to be a feminist pedagogical method that promotes care, justice, and inclusivity. To theorize it in this way, though, we must unstick ourselves from age-old revision practices that have dominated writing studies research and teaching for decades. One way to promote new, more powerful, expressions of revision is to take revision public. While it is often done in private and discussed as a sort of punishment or failing, revision, a method for change, is an expression of hope. It is power. Potential. This presentation will use the highly public case study of Taylor Swift's re-recording project (where she is revising and re-releasing her first 6 albums in order to own her work) as a case study that helps us understand revision as a source of power, autonomy and activism. Ultimately, public revision serves as a pedagogical method that promotes feminist change and inclusivity in our communities. (Faculty Sponsor: Dr. Jacquelyn Hoermann-Elliott)

3. BEYOND THE NEON. J. Rangel. Arts and Design – Visual Arts

Neon signage, color and text play a role in shaping the visual landscape of America. Used as advertising tools their significance extends beyond the functional purpose that they serve. In this presentation, I draw from French philosopher Jean Baudrillard's theory of hyperreality which explores the experience that signage itself gives the viewer. My work captures these spaces that have illuminated words, oversized text, and bright colors. I photograph the eye-catching qualities of signage and use mixed media such as printmaking, lighting, and additional text to further the physiological pull of letters. My goal is to create the same relationship between the viewer and the art that would occur when seeing these visuals in real life, to not just recreate or take a photo of the signage but to also tap into the psychology, hyperrealism, and nostalgic feelings that the work creates. (Faculty Sponsor: Dr. Sara Ishii)

4. OBJECTS AS SCARS: MEMORY AND ERASURE IN JULIA SOLOMONOFF'S HERMANAS. M. Collier. Language, Culture, and Gender Studies

Julia Solomonoff's film Hermanas (2005) explores the role of physical things in the perseverance of memory, particularly in times of censorship and historical erasure, through the story of two sisters grappling with Argentina's traumatic past. While objects, like the father's novel and an old photograph, hold traces of history, they are simultaneously at risk of manipulation, altering the physical object as well as associated memories. Literature, much like physical artifacts, becomes a site of mourning and reckoning, a means of resisting collective amnesia. Through a film analysis utilizing various theories, including Pierre Nora's lieux de mémoire, Bill Brown's thing theory, and Marianne Hirsch's postmemory, as well as Cathy Cuther's work in trauma studies, this presentation examines Hermanas as a meditation on what remains after people and events fade: objects as scars, bearing witness to the past. (Faculty Sponsor: Dr. Angela Mooney)

5. SHADES OF LIFE AND DEATH: THE USE OF COLOR IN ARTHUR PENN'S BONNIE AND CLYDE. M. Walters. Social Sciences and Historical Studies

This presentation explores how the strategic use of color in Arthur Penn's 1967 Bonnie and Clyde influenced the popular memory and perception of Texas desperados Bonnie Parker and Clyde Barrow. Strategically using color to affect viewers' perceptions and emotional responses is referred to as Color Theory. The research conducted shows that Bonnie and Clyde used the colors red, blue, and pink to convey feelings and perceptions of love, naivety, loyalty, and innocence. The use of these three colors aided in shifting the public's perception and popular memory of Bonnie Parker and Clyde Barrow from Depression Era renegades to iconic young couple. Analyzing color theory in Bonnie and Clyde answers the question, how has color influenced the popular memory of Bonnie Parker and Clyde Barrow. Additionally, this study opens the door to further discussions on Bonnie and Clyde and other similar historical dramas. (Faculty Sponsor: Dr. Christina Bejarano)

Session 1. Tuesday, April 22, 9:00 am – 10:20 am Track B (Student Union 2238)

1. WEARABLE TECHNOLOGY FOR MITIGATING SHOULDER

INJURIES IN ASTRONAUTS: A PRELIMINARY ANALYSIS. H. Alvis, K. Cheng, K. Mori, M. Hanks, S. Huang, Y. Kwon, R. Rigby. Kinesiology

Shoulder injuries are the second most common injury experienced by astronauts. To prevent injury, wearable devices for monitoring and analyzing shoulder motion may be utilized. The purpose of this study was to validate the capability of the Shoulder and Labrum Evaluation Equipment for Vibrational Execution (SLEEVE) device to accurately measure shoulder motions in real-time. One inertial measurement unit, and three retroreflective markers, were placed on the upper arm of an artificial glenohumeral joint. Thirteen trials of shoulder abduction/adduction and flexion/extension were captured using an optical motion capture system. Root mean square analyses revealed errors of 2.2^{o} for abduction/adduction, and 2.3^{o} for flexion/extension. Intra-class correlations were measured as 0.997 for abduction/adduction and 0.998 for flexion/extension. These results support the capability of the SLEEVE device to accurately and precisely measure shoulder movements in real-time. Additionally, these results indicate the SLEEVE may provide an innovative solution for mitigating shoulder injuries in astronauts. (Faculty Sponsor: Dr. Brandon Rhett Rigby)

Supported by the Texas Space Grant Consortium (TSGC), TWU Center for Student Research, the TWU Fall 2019/Spring 2020/Spring 2023 TSGC Design Teams.

2. OCCUPATIONAL THERAPY PRACTITIONER'S GUIDE TO WORKING WITH ADDICTION. K. Northrip, J. Martin. Occupational Therapy - Dallas

Occupational therapists frequently work with individuals experiencing addiction, but often underutilize the profession's unique potential to support recovery through environmental and contextual adaptation. This gap stems, in part, from an incomplete understanding of addiction's etiology and outcomes. This research integrates trauma-informed care, the transtheoretical model of change, and occupation-based theories with knowledge of neurological, physiological, behavioral, and environmental mechanisms of addiction to create an educational guide of holistic treatment strategies for occupational therapy practitioners. The introduction focuses on mechanistic knowledge, which helps destigmatize addiction for both practitioners and individuals in recovery while guiding intervention approaches. By applying trauma-sensitive, occupation-based strategies—including environmental and task modifications, and social support—therapists can minimize ego fatigue and enhance the sustainability of recovery efforts for individuals with addiction. (Faculty Sponsor: Dr. Jennifer Martin)

Supported by TWU Experiential Student Scholars Program.

3. ACTING OUT: ANALYZING METHODS OF COUNSELING IN RELATION TO THEATER OF THE OPPRESED. S. Iqbal, I. Luna, D. Shirinian. Human Sciences

This presentation intends to analyze Theater of the Oppressed principles (Boal & McBride, 2020) and psychodramatic theory (Karp, et al., 1998) to promote trauma healing and education. Theater of the Oppressed has been used previously in conjunction with therapeutic ideas, but has yet to be implemented in a specifically therapeutic fashion (Schutzman & Cohen-Cruz, 1994). This presentation will identify new methods to assist clients in regaining control of their circumstances and reestablishing their sense of self through the use of psychodramatic theater of the oppressed. (Faculty Sponsor: Dr. Diana Rodriguez)

4. TELEVISION, DEVELOPMENT, AND FAMILY: MAKING INFORMED MEDIA CHOICES FOR CHILDREN. S. Santhosh, N. Gillum. Human Sciences

This presentation is a literature review focused on exploring the impact of television on children ages 3 years to 6 years, particularly its influence on children's behaviors, emotions, and social skills and on their family interactions. Developmental concerns associated with excessive screen time, as well as benefits of positive programming were investigated. Additionally, programs and resources that can support children's growth and strengthen family bonds were explored. The findings were used to develop an informative pamphlet for families. The goals were to understand the effects of television so parents and caregivers can make informed decisions that can foster healthier media consumption habits. (Faculty Sponsor: Dr. Nerissa Gillum)

5. SCREEN TIME & DIGITAL SAFETY. M. Huynh. Human Sciences

The Screen Time & Digital Safety Parent Education Program equips parents with the information and tools necessary to support their children's healthy and safe digital way of life. As digital access continues to expand, children are confronted with more threats, including cyberbullying, indecent material, and excessive screen time. The program provides practical tips for helping parents manage screen time, recognizing and evading objectionable material, and setting up parental controls. Parents will learn how to set digital boundaries without compromising the healthy use of technology through workshops, professional consultations, and an online support network. By empowering parents with the proper tools, the program aims to enhance safety online, develop good internet habits, and lead to more effective communication with families in this digital age. (Faculty Sponsor: Dr. Emily Morehead)

Session 2. Tuesday, April 22, 2:40 pm – 4:00 pm
Track A (Student Union 2231)

1. FACTORS INFLUENCING HOUSEHOLD ADOPTION OF DENGUE PREVENTION BEHAVIORS IN DENGUE ENDEMIC COUNTRIES- SOUTHEAST ASIA. S. Rana. Health Promotion

Dengue fever is a significant public health concern in Southeast Asia with a rapid rise in cases in recent years. The study examined factors related to dengue prevention using the

Health Belief Model (HBM), positing that individuals' perceived health threats, benefits, and barriers influence health behaviors. A literature search was conducted using PubMed and EBSCOhost databases and search terms including dengue prevention, health behavior model and HBM. Three out of the six identified articles were selected based on geographical relevance. Low perceived severity of and susceptibility to dengue, especially among young and older men, appeared to inhibit community-based prevention programs. Individuals with perceived barriers or low self-efficacy were less likely to adopt preventive measures. However, community alerts (reported dengue cases) motivated individuals to take preventive actions. This study highlights the need for evidence-based, culturally tailored health communication strategies that effectively promote dengue prevention, ultimately reducing disease burden in the region. (Faculty Sponsor: Dr. Aya Yoshikawa)

2. BEYOND EMPTY: UNDERSTANDING MATERNAL CAREGIVER BURNOUT. S. Penson. Arts and Design – Visual Arts

Having a child with special needs has taught me that society often converges caregiving with motherhood. Being both a mother and a full-time caregiver creates a complex duality that few understand. Several of my creative expressions are enlightened by writer Kate Washington and her experience as being plunged "directly, and unexpectedly, into intense caregiving." She highlights the effects of burnout that deplete caregivers in a way in which they no longer effectively take care of themselves. According to Joan Tronto's, "The Ethics of Care," burnout stems from society's devaluation and overburden of care work, often experienced by individuals who are disproportionately responsible for caring for others. In my artwork, I place seemingly disparate elements, creating an abstract narrative, which reflect the complex reality of my life with my son. I invite viewers to step into our world, fostering understanding and creating connections with others who walk similar paths. (Faculty Sponsor: Dr. Sara Ishii)

3. SEMIOCAPITALIST AESTHETICS. J. Freund. Arts and Design – Visual Arts

Drawing from media and attention theory, my art-based research investigates attention, sensation, and rest in contemporary culture. I critically engage with semiocapitalism, whereby the production and manipulation of information, images, and signs reshapes attention, sensory experience, and cognitive processes, leading to bifurcations of focus in contemporary culture. Through sculpture, video, and performance, I engage auditory and visual stimuli derived from ASMR (Autonomous Sensory Meridian Response), a once-subcultural phenomenon now prevalent in popular culture. Situated within neurodivergence and perception theory, I explore the tension between hyperstimulation and sensory regulation. Aesthetically, my work both appropriates and resists cognitive, affective, and perceptual labor. I combine the fever-dream-like aesthetics of advertising with the materiality of touch, recursive gesture, and ambisonic sound, creating experiences that promote somatic soothing and the integration of multiple perceptual responses. Contextualized by personal experience, my research positions neurodivergent processes as alternative modes of engagement within a contemporary attention economy. (Faculty Sponsor: Dr. Sara Ishii)

4. QUEERING DESIRE IN VISUAL ART: NAN GOLDIN'S PHOTOGRAPHY AS SHIFTING NORMATIVITY. H. Leisure. Arts and Design – Visual Arts

Historically, visual art has presented sexuality and desire in numerous ways, integrating the dynamics of physical bodies, human relationships, and sex, but often dominated by rigid, heteronormative conceptualizations. In this presentation, I offer Nan Goldin's photography as a means of subverting pervasive norms of sexuality and revealing other embodiments of desire. Goldin's photographic documentation of queer life in the 1980s pioneers the careful dissection of queer existence and desire as being on the periphery of mainstream culture and penetrating reductive, normative conventions. By applying linguist Louise O. Vasvári and philosopher Jana Sawicki's theorizing on queer desire, viewers can understand Goldin's photography relative to its heteronormative social contexts. Through the exploration of the implications of queer desire in Goldin's photography, she calls attention to the complexities of queer relationship dynamics, and this is significant for rejecting prevalent, homogenizing stereotypes of desire and providing insight into the realities of queer desire. (Faculty Sponsor: Dr. Sara Ishii)

Session 2. Tuesday, April 22, 2:40 pm – 4:00 pm Track B (Student Union 2238)

1. EUPHORBIA BICOLOR AND ITS POTENTIAL THERAPEUTIC ROLE IN REGULATING NEUROPLASTICITY POST-BURN. T. Olaoluwa, D. Hynds, C. Maier, D. Averitt. Sciences – Biology

Burn injuries are among the most severe forms of trauma, often leading to persistent pain and long-term sensory dysfunction. Beyond the immediate tissue damage, burn injuries induce profound neuroplastic changes in the central and peripheral nervous systems, which can contribute to the transition from acute to chronic pain. Euphorbia bicolor, a plant native to North America, has been studied for its analgesic properties. We hypothesize that E. bicolor extract reduces pain sensitivity with evidence of reduction in TrkA and TrkB proteins associated with neuroplasticity. Rats received sham or full thickness thermal injury to the plantar surface of the right hind paw. After 72 hours, rats received intraplantar injections of either vehicle or E. bicolor latex extract (500µg/mL). At 8 weeks, spinal cord (L2-L5) was collected. Western blot and Immunohistochemistry were performed with TrkA and TrkB antibodies. Lower protein levels would correlate with E. bicolor's neuromodulatory effect to reduce pain sensitivity. (Faculty Sponsor: Dr. Dayna Averitt)

Supported by TWU REP and TWU Center for Student Research.

2. SLEEP DURATION IN MIDDLE-AGED ADULTS PREDICTS THE AGE OF ONSET OF PARKINSON'S DISEASE. C. Clark, R. Rigby. Kinesiology

Chronic short sleep duration (SD; <7 hrs daily) may reduce the brain's ability to clear toxins and protein aggregates linked to Parkinson's disease (PD). This study examined the relationship between self-reported SD and age of PD onset using secondary data from the Fox Insight study. In 2,310 participants, multiple regression analyses identified that SD between ages 46-55 significantly predicted earlier PD onset ($p<0.001$), even after controlling for education, income, race, ethnicity, and sex. In a final model, weekly duration of time spent performing moderate-intensity physical activity (MPA) was added as an input variable. In addition to a main effect for sleep time ($p<0.001$), MPA time ($p=0.007$), but not the interaction of sleep by MVP ($p=0.051$), emerged as a significant predictor of age of onset of PD. These findings suggest that SD in middle age may accelerate PD onset, highlighting the importance of sleep in determining the onset of PD. (Faculty Sponsor: Dr. Brandon Rhett Rigby)

Supported by the Fox Insight Study (FI), funded by The Michael J. Fox Foundation for Parkinson's Research.

3. IMPACT OF MOCK INTERVIEWS ON UNDERGRADUATE NURSING STUDENTS' SELF- EFFICACY IN ACQUIRING PROFESSIONAL NURSING POSITIONS. L. Ford. Nursing - Dallas

Interviewing for potential careers can create high levels of anxiety and low self-confidence in students. However, utilizing mock-interviews has the potential to improve self-confidence and decrease anxiety by providing students with an opportunity to practice their interviewing skills in a safe environment. Mock-interviews were conducted via online video application, and interviewers were provided with standard interview questions and a feedback guide to be discussed with the students following the interview. Students completed pre- and post-surveys to evaluate the impact of the mock-interviews on their self-efficacy and confidence in interviewing for new graduate nursing positions. (Faculty Sponsor: Dr. Cecilia Wilson)

4. SEX DIFFERENCES IN THE EFFECTS OF STRESS ON PAIN MECHANISMS IN THE TRIGEMINAL GANGLIA IN A PRECLINICAL MODEL OF INFLAMMATORY OROFACIAL PAIN. B. Islam, D. Averitt. Sciences – Biology

Psychological stress contributes to and amplifies orofacial pain, which is more prevalent in women. Exposure to sub-chronic stress exacerbates inflammatory orofacial pain to a greater degree in females than males. Our lab identified sex-specific differentially expressed genes such as Tmem45b, P2rx3, and Col3a1 by transcriptomic analysis of the trigeminal ganglia (TG) of rats exposed to stress. To identify the genes/proteins contributing to sex differences in pain, we performed qPCR for Tmem45b and P2rx3 and immunohistochemistry (IHC) for the P2RX3 protein. Rats received an injection of complete Freund's adjuvant or saline into the right vibrissal pad followed by a forced swim test (FST) or sham paradigm for 3 days. Following day 3 of FST, ipsilateral TG were extracted and processed for qPCR and IHC. Our data shows that P2rx3 and Tmem45b are highly expressed in stressed females than males. Similarly, we found higher expression of P2RX3 in females compared to males. (Faculty Sponsor: Dr. Dayna Averitt)

Supported by NIH NIDCR R15 DE025970, TWU Center for Student Research, and TWU Experiential Student Scholars Program.

5. PANGENOMIC-BASED IDENTIFICATION OF STRAIN-SPECIFIC MARKERS FOR RAPID DETECTION OF NITROGEN-FIXING SINORHIZOBIUM BACTERIA. M. Mehebub, C. Pislariu. Sciences – Biology

The environmentally-friendly symbiotic association between legumes and nitrogen fixing bacteria from the soil allows this group of plants to acquire bioavailable nitrogen, bypassing the need of applied fertilizers. Not all associations are equally compatible and efficient. Research involving single strains and communities of bacterial strains is challenging due to potential cross-contamination. Strain identification by phenotype and 16S ribosomal RNA gene-based Polymerase Chain Reaction (PCR) are unreliable. Using a pangenomics approach, strain-specific markers for six Sinorhizobium meliloti, three S. medicae, and two S. fredii strains were identified and validated by duplex PCR and Sanger sequencing. For S. meliloti 1021, one strain-specific Single-Nucleotide Polymorphism (SNP) marker was identified. These strains are used to study host-strain specificity in symbiotic interactions with the legume host Medicago truncatula. These markers can rapidly, economically, and accurately identify 12 Sinorhizobium strai (Faculty Sponsor: Dr. Catalina Pislariu)

Supported by NSF Award 2139351.

Session 3. Tuesday, April 22, 6:00 pm – 7:20 pm Track A (Student Union 2231)

1. SILENCED. K. Kypuros. Arts and Design – Visual Arts

Trauma is the cornerstone of my series Exposed, however trauma can be a result of aplethora of experiences stemmed from abuse. So as to create a more concise concept I amincluding the added focus on trauma as a result of addiction. I am looking at this concept within the realm of female identity and male identity which are the basis of John Berger's Ways of Seeing. Wherein Berger speaks openly about the duality of female identity as both the surveyor and the surveyed, depicting the continual self- assessment, and reassessment based on appreciation of herself by another. My work is a cathartic process of exposure, revealing my experiences as a survivor of sexual assault, and an individual affected by a family embedded with addiction, through the use of photography. The sole goal of my work is to spread awareness whilst uplifting the victim, the broken living in silence. (Faculty Sponsor: Dr. Sara Ishii)

2. COWBOY CARTER SPEAKS: SESSION 1. J. English. Language, Culture, and Gender Studies

Beyoncé's Cowboy Carter, released March 29, 2024, was met with acclaim and intrigue, but roundly dismissed by traditional country arenas, with its artist noticeably excluded from country music radio and awards circuits. Resurrected for a stunning Christmas Day NFL halftime performance, and earning top accolades at the Grammy Awards, Cowboy Carter, to great consternation on one end and the highest aplomb on another, has cemented itself in this artistic moment. This critical cultural analysis of the album giddy-ups through the work, situating it within its historical, rhetorical, and cultural frame, tipping a hat towards country music's Black roots as well as its complication of the country genre. Using the album's words and imagery to respond to critics, this presentation heralds Cowboy Carter as a testament of past, present, and future, but also the embodiment of what might have been had Black America not been shut out from the music it originated and continues to influence. (Faculty Sponsor: Dr. Genevieve West)

3. WOMEN'S WORDS: SHARING WOMEN'S REPRODUCTIVE HEALTH EXPERIENCES THROUGH VISUAL ART. L. Doorish. Arts and Design – Visual Arts

My work revolves around restrictions to women's reproductive healthcare in the United States and the negative effects these changes have on women both individually and collectively. According to Loretta Ross's work Reproductive Justice, the Reproductive Justice movement, part of the broader feminist movement, advocates that all women have the opportunity to choose when and if they have a child and receive adequate healthcare. I draw on the importance of women's stories to "shift the lens" and reveal a more comprehensive understanding of how intersectionality impacts a woman's ability to obtain reproductive healthcare. My art incorporates stories of women to share their beliefs related to women's rights, their ability to access healthcare, and their worries for the future. My goal is to draw attention to the importance of reproductive justice, illuminate the multiple facets of women's lived experiences, and bring their voices to the public discourse on reproductive care access. (Faculty Sponsor: Dr. Sara Ishii)

4. OVERCOMING BARRIERS IN REAL WOMEN HAVE CURVES. D. Cervantes-Villarreal. Language, Culture, and Gender Studies

Patricia Cardoso's Real Women Have Curves (2002) explores the struggles of young Latina women facing gender, cultural, and socioeconomic constraints. This presentation examines the opposing reactions of Anna and her mother to their society. How Ana García resists societal expectations, particularly regarding body image, education, and family duty. Whereas her mother conforms. I argue that by highlighting Ana's resilience, Real Women Have Curves amplifies Latina voices and critiques restrictive norms. This presentation situates the film within broader Latina representation in U.S. media, showing how Mexican American women challenge oppression and claim autonomy. (Faculty Sponsor: Dr. Angela Mooney)

5. VIDEO MODELING AS A METHOD FOR TEACHING VOCATIONAL SKILLS TO STUDENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES. B. Hines. Teacher Education

Research indicates that the current employment rate in the United States for individuals with intellectual disabilities (ID) was only at 20%, however, 59% of individuals indicated that they would want to be employed (Human Services Research Institute, 2016; National Association of State Directors of Developmental Disabilities Services, 2015; United States Department of Labor, 2016). The barriers to employment for individuals with ID can be attributed to deficits in adaptive and cognitive function that require interventions for acquisition of vocational skills. The employment rate for individuals with ID can be increased by development of vocational skills, further increasing their quality of life and independence. Research has suggested that video technology interventions have been successful for teaching a variety of tasks and functional skills (McDuff et al., 2021). This presentation will review current research on the use of video technology to teach vocational skills to individuals with ID. (Faculty Sponsor: Dr. Minkowan Goo)

Session 4. Wednesday, April 23, 9:00 am – 10:20 am Track A (Student Union 2231)

1. USING CRISPR-BASED EDITING TO UNDERSTAND LIAT1 FUNCTION. K. Budhathoki, C. Brower. Sciences – Biology

CRISPR/Cas9 (Clustered regularly interspaced short palindromic repeats/CRISPR-associated protein 9) is a powerful genome editing tool that enables precise genetic modifications. The CRISPR/Cas9 system is widely utilized to study disease mechanisms, cancer research, and the development of new therapeutics by creating targeted knockouts and knock-ins. In our lab, we are interested in understanding the functional role of the Ligand of Arginyl-transferase 1 (Liat1) protein using CRISPR/Cas9-mediated genome editing techniques. We have developed an inducible CRISPR/Cas9 system to knockout Liat1 to study the immediate effects of Liat1 depletion. Additionally, we are developing a CRIS-PITCh (CRISPR-mediated Precise Integration into Target Chromosome) knock-in approach to tag endogenous Liat1 with mCherry, allowing real-time visualization. These tools will help provide critical insights into the biological functions of Liat1. (Faculty Sponsor: Dr. Christopher Brower)

Supported by TWU Experiential Student Scholars Program.

2. USING NONINVASIVE BRAIN STIMULATION TO ENHANCE AUDITORY EMOTION REGOGNITION IN YOUNG ADULTS WITH AUTISM. M. Nishida, J. Mehta. Communication Sciences and Oral Health

This presentation explores the effects of an ongoing research study using transcranial direct current stimulation (tDCS) on auditory emotion recognition in young adults with Autism Spectrum Disorder (ASD). ASD presents significant challenges

in social communication, particularly during the transition to adulthood. This double-blind randomized controlled trial aims to assess whether tDCS enhances auditory emotion recognition when combined with traditional social communication therapy. Participants aged 18-30, diagnosed with high-functioning ASD, are randomly assigned to either an active tDCS group or a control group receiving sham stimulation. Pre- and post-intervention assessments evaluate participants' ability to identify complex emotions from verbal expressions. Follow-up testing one month post-intervention investigates the persistence of treatment effects. Findings are anticipated to provide valuable insights into the potential of tDCS as an adjunctive therapy, ultimately contributing to improved social skills and quality of life for young adults with ASD. (Faculty Sponsor: Dr. Jyutika Mehta)

Supported by TWU Woodcock Institute Research Grant; TWU Center for Student Research.

3. CRYAB STATE IS ALTERED FOLLOWING A MILD REPETITIVE BLAST INJURY. N. Yasin, E. Palacios, Z. Lybrand. Sciences – Biology

Traumatic brain injury (TBI) is a major public health concern, with mild TBI (mTBI) being the most common form. Repetitive mTBIs are linked to neurodegenerative diseases, yet the molecular mechanisms driving injury response are poorly understood. CRYAB (αB-crystallin), a small heat shock protein, has been implicated in regulating cellular stress responses during CNS injury, but its role in TBI remains unknown. Using a cerebral organoid model of mTBI, which are human-induced pluripotent stem cell (iPSC)- derived 3D tissue cultures, we characterized the expression of CRYAB post- blast via RNA sequencing, tissue histology, and Western blotting. Results indicate an increase in CRYAB RNA transcripts one hour after blast, followed by peak protein expression at 24 hours, suggesting a dynamic role in the injury response. Currently, we are investigating whether this increase results from true CRYAB upregulation or oligomerization, a common response to cellular stress. (Faculty Sponsor: Dr. Zane Lybrand)

4. TDP43 FRAGMENTS AND NEURODEGENERATION: A GAIN OF FUNCTION MECHANISM TO TOXICITY. W. Mirembe, E. Na, C. Brower. Sciences – Biology

Neurodegenerative diseases like Amyotrophic Lateral Sclerosis and Frontotemporal Dementia can be caused by protein misfolding and toxic aggregation. Although therapies exist for alleviating such diseases, there is no known cure. Our research is centered on the human TAR DNA-binding protein 43 (TDP43), which has a strong association with neurodegenerative diseases. During pathological conditions, TDP43 is mislocalized from the nucleus and proteolytically cleaved into several aggregation-prone fragments in the cytoplasm (e.g. TDP43219, TDP43247). Studies show that the loss of TDP43 function contributes to toxicity in cells. We hypothesize that TDP43 fragments also contribute to disease through a gain-of-function mechanism. To test this, we expressed disease-associated TDP43 fragments in primary neurons to examine neurodegenerative hallmarks such as aggregation. We also expressed these fragments in the upper motor cortex of mice that retain intact TDP43 and examined the mice for motor defects. Our results indicate that TDP43 fragments may contribute to neurodegeneration. (Faculty Sponsor: Dr. Christopher Brower)

5. BLAST OVERPRESSURE FRAGMENTS NEURAL NETWORKS TO DECREASE STABILITY. N. Smith, S. Ayalavarapu, Z. Lybrand. Sciences – Biology

Blast-induced traumatic brain injury (bTBI) affects both military and civilian populations involved in explosions and high-pressure waves and is known as an “invisible injury” due to the lack of any external injury. The effects of bTBI are poorly understood, specifically on network dynamics, limiting our understanding of rehabilitation techniques. To explore these effects, we used cerebral organoids, a stem cell-derived 3D tissue structure that mimics human neuronal networks. Using pulsed stimuli to synchronize activity and a multi-electrode array (MEA), we found that exposure to blast overpressure fragments the neural network, reducing network stability after injury. Additionally, pharmacological inhibition of the GABAergic signaling pathway also increased fragmentation, suggesting its role in stabilization of the network and potentially being a target of bTBI. Together, these findings provide a foundation in understanding the consequences of blast trauma and possibly lead to rehabilitation strategies. (Faculty Sponsor: Dr. Zane Lybrand)

Session 4. Wednesday, April 23, 9:00 am – 10:20 am Track B (Student Union 2238)

1. EXPLORING LOSS, IMPERMANENCE, AND PRESERVATION. J. Alvarez. Arts and Design – Visual Arts

In this presentation, I will discuss my artwork, which includes fibers dyed with natural materials and mixed media to create structures that resemble the human body. This artwork visually utilizes the theory of abjection, developed by Julia Kristeva, which reveals that humans dissociate with things formerly related to our bodies, especially those which remind us of our mortality. The concepts within my work are inspired by the dual process model of coping, developed by Margaret Stroebe and Henk Schut, which recognizes that coping with grief involves the oscillation between two processes, one defined by expressing the feelings associated with loss, and the other focused on adapting to life after loss. By confronting my audience with forms, colors, and textures associated with the human body and bodily fluids, my goal is to materialize the idea of death within the context of my personal experiences with loss. (Faculty Sponsor: Dr. Sara Ishii)

2. MY BLACK JOY IS BLACK ACTIVISM. T. Hilley-Carroll. Arts and Design – Visual Arts

Black Joy is a radical act of resistance, reclamation, and strength

in the face of historical and ongoing oppression. It challenges narratives that reduce Black existence to pain, instead centering on creativity and power. Rooted in theories from scholars like Audre Lorde and bell hooks, Black Joy functions as an act of defiance. This paper explores what is Black Joy and how visual art is a vessel, creating spaces for Black artists to express joy as political activism. Through works by artists like Mickalene Thomas and Hank Willis Thomas, my research examines how materiality, visual culture, and audience engagement shape representations of Black Joy. (Faculty Sponsor: Dr. Sara Ishii)

3. EXISTENTIAL. F. Islam. Arts and Design – Visual Arts

Because of the culture I live in, some people instinctively criticize everyone's external appearance, which indicates how society wants to see them. Some people still express insecurities, even if they are perfectly beautiful. This gaze creates negative cultural perceptions of age and beauty. The work of the artists Louise Bourgeois, Rachel Rosenthal, and Nettie Harris explores how they expose, critique, subvert, and exceed "the youthful structure of the look." The female body is presented boldly, bracingly as the continuing site of gender and sexuality. I feel the perfect image of beauty is impossible to reach and the climb there is not without its consequences. Women should be valued not only by their looks but also by their personalities and intelligence. I have created paintings of women's portraiture with a collaboration of yarns and plan to make a tapestry collage of women's physique with wood. (Faculty Sponsor: Dr. Sara Ishii)

4. PEDIATRIC PATIENTS TREATED IN ADULT HOSPITALS: A SCOPING REVIEW. K. Hildreth, A. Verdin. Human Sciences

A scoping review was conducted to map what is known in the extant literature about developmental impacts on pediatric patients who are treated in adult healthcare settings. After a literature search and screening, 13 empirical articles were chosen for data extraction and synthesis. Using thematic analysis, six themes emerged: (1) Disproportionate perspectives represented in the data, (2) Healthcare providers seeking development of pediatric skills, (3) Lack of staff psychological support, (4) Inadequate training resulting in inadequate outcomes, (5a/b) Provider competence by developmental age group and type of care is highly variable. Implications of the findings reflect prior literature emphasizing the need for safer healthcare practices for children and a strong need for policy change addressing children's psychosocial, physical, and psychological safety. The lack of existing studies on this phenomenon reflects the need to better understand the structural determinants resulting in disparate care of children in adult healthcare settings. (Faculty Sponsor: Dr. Azucena Verdin)

Supported by TWU Experiential Student Scholars Program.

5. CREATING SECURE ATTACHMENTS WITH YOUR CHILDREN AS A MILITARY FAMILY. E. Sawyer-Warren, N. Gillum. Human Sciences

This presentation is about research on educating military parents about ways to develop and maintain secure attachments with their 3 years old-6 years old children. This information can be beneficial to these parents and their children while these parents are in the demanding business of military life (e.g., deployment, last minute work, late nights). (Faculty Sponsor: Dr. Nerissa Gillum)

Session 5. Wednesday, April 23, 2:40 pm – 4:00 pm Track A (Student Union 2231)

1. ESTIMATION OF THE GROUND REACTION FORCES DURING GOLF SWING USING RECURRENT NEURAL NETWORKS. K. Mori, Y. Kwon. Kinesiology

Accurate ground reaction force (GRF) measurement is essential for in-depth golf swing analysis, but force plates are costly and pose installation challenges. This study develops an AI-based GRF estimation method using a Bi-LSTM model, offering a cost-effective alternative. Motion capture data (37 markers on golfer's body; 500 Hz) and GRF data (2 force plates; 2,000 Hz) from 1,032 swings by 344 golfers were used to train the model, with data from 29 unseen golfers reserved for validation to prevent overfitting. The data were phase-normalized to 1,000 frames. A total of 864 models were trained using cross-validation and grid search, with the best-performing model selected based on ICC. The model achieved high accuracy (ICC up to 0.983), particularly for lead foot vertical GRF. This approach provides a scalable, cost-effective solution for movement analysis, with potential applications beyond golf. Future research will focus on optimizing marker selection to reduce input data. (Faculty Sponsor: Dr. Young-Hoo Kwon)

2. ECOFEMINISM IN WHOSE NAMES ARE UNKNOWN. L. Poveda. Language, Culture, and Gender Studies

In Sanora Babb's novel Whose Names are Unknown, women play a crucial role in helping their families escape the environmental disaster in Oklahoma and survive the economic crisis in California. From Babb's childhood in Oklahoma to her volunteer work with the California Farm Security Administration, Babb uses her own experiences and research to write an authentic novel that highlights women's resilience and agency in a challenging environment. As Sophie Toff, a PhD candidate and an expert in ecofeminism explains, "[t]he 'structural' or 'systemic' oppression ecological feminists' refer to arises when a system unjustly distributes power, creating an illegitimate imbalance." Whose Names Are Unknown is an important ecofeminist novel with a timeless theme because it reminds us of women's resourcefulness, resilience, and connection to the land that has become central to survival in any environmental and economic crisis. (Faculty Sponsor: Dr. Genevieve West)

3. SIR MODELS AND COMPUTER VIRUSES. R. Diaz, d. Sanchez, M. Hernandez. Sciences – Mathematics

A computer virus is a type of malware designed to disrupt or

damage computer systems and networks that replicate and spread across devices. Similar to biological viruses, computer viruses propagate through networks, infecting hosts and replicating. Given these similarities, epidemiological models such as the Susceptible-Infected-Recovered model and the more advanced Susceptible-Infected-Infected Dormant-Recovered model have been used to study the transmission dynamics of digital infections. This paper explores how these models can be applied to analyze the propagation of the WannaCry ransomware worm, which caused a global cyberattack in 2017. The key objectives are to examine how WannaCry was contained and mitigated, assess the effectiveness of the SIR model, and explore the SIIDR model as a more reliable framework for capturing the behavior of ransomware worms. By leveraging these epidemiological models, this study aims to highlight their role in understanding malware spread and developing strategies for managing future cyber threats. (Faculty Sponsor: Dr. Junalyn NavarraMadsen)

4. HEALTHY FOOD POLICIES. J. Cobos, D. Chavez, F. Brito Silva, T. Freeman, K. Davis. Nutrition and Food Sciences - Denton

Many college students face challenges in maintaining a healthy diet, with over half experiencing overweight or obesity and more than 70% consuming sugar-sweetened beverages daily. Since most students rely on campus dining, creating a supportive food environment is essential. The Health and Wellbeing Initiative (HWI-Eat Well) developed suggested food policies based on the Food Environment Project, which explored student satisfaction, accessibility, affordability, and healthfulness of campus food. Recommendations include prioritizing plant-based options, reducing red meat, offering healthier vending choices, and promoting unsweetened beverages while limiting sugary drinks. Universities like the University of North Texas and the University of Texas at Austin have successfully implemented similar policies. We compare HWI's suggested policies with those at other universities, share updates on TWU's progress, and explore future opportunities to enhance campus nutrition. Together, we can create a healthier, more supportive food environment for all students. (Faculty Sponsor: Dr. Kathleen Davis)

Supported by Health and Wellbeing Initiative.

5. THE FEMINIST KILLJOY ON SCREEN: ANALYZING THE ROLES OF AMERICA FERRERA. T. LaBanca. Language, Culture, and Gender Studies

The Feminist Killjoy defined by writer Sara Ahmed is unapologetically outspoken, disruptive, and willing to call out injustice. The killjoy in pointing out a problem often in turn becomes a problem to those around her. Honduran American actress America Ferrera frequently portrays characters that embody this concept. Characters like Ana from the film Real Women Have Curves, demonstrate the ways young women can subvert and defy racialized gendered norms. Ana speaks her mind often pushing against feminine and cultural expectations causing conflict with her family. This presentation will analyze Ferrera's roles through the lens of the Feminist Killjoy drawing parallels between characters. As well, I will investigate the ways Ferrera informs her roles through her own activism and feminist practice. (Faculty Sponsor: Dr. Angela Mooney)

Session 5. Wednesday, April 23, 2:40 pm – 4:00 pm Track B (Student Union 2238)

1. THE SUBLIME IN THE MUNDANE. S. Seaborn. Arts and Design – Visual Arts

My portraits and films of ordinary objects reflect the beauty I see around me: tree shadows on houses in my neighborhood; the wind whipping tree branches back and forth, my neighbor heroically planting a pollinator garden. These moments of beauty take me out of my everyday life. In this presentation, I discuss how I seek to bring this beauty into my art. The 17th century philosopher Arthur Schopenhauer believed that life is suffering, and losing ourselves in contemplation of the sublime brings tranquility. He believed this sublime state can be found in the viewing of art. I try to capture this transcendent state in my work such that the viewer also "loses themselves." I amplify the sense of tranquility by reducing information, limiting the color palette, and using simplified shapes of lights and darks. My hope is that viewers will also experience tranquility when contemplating my work. (Faculty Sponsor: Dr. Sara Ishii)

2. MY BLACK JOY IS BLACK ACTIVISM: BLACK CREATIONS AND HAPPINESS AS A MEDIUM OF ACTIVISM EXHIBITION. T. Hilley-Carroll. Arts and Design – Visual Arts

This research paper examines the process of developing the My Black Joy is Black Activism workshop and curating the accompanying exhibition, exploring how Black joy functions as a means of activism. By engaging with Black student organizations on campus I intended to encourage community involvement and create a space of respite and reflection for Black people. The workshop and exhibition drew inspiration from Black artists such as Mickalene Thomas and Gio Swaby and Black scholars such as bell hooks, Audre Lorde, and Alice Walker. The construction and launch of this workshop and exhibition will disseminate the knowledge of Black Joy to the public exemplifying the impacts it has as a form of activism. (Faculty Sponsor: Dr. Sara Ishii)

3. NEUROAESTHETICS: EXPLORING THE BRAIN THROUGH ART. E. Camp. Arts and Design – Visual Arts

Neuroaesthetics, an interdisciplinary field of research, explores the psychological, biological (specifically neuroscientific), and emotional intersections of art interpretation - in other words, how the brain perceives and responds to beauty. Examining art on a neuronal basis has been largely criticized by art theorists, as many philosophers believe it is unjust to look at the abstract subject of aesthetics scientifically. Others, make the argument that art experiences are completely biological, encoded in our genes. By gathering a wide range of published research in the realms of art theory, philosophy, and neuroscience, this

investigation aims to provide a holistic overview on whether the experience of art is deeply rooted within our biology. Through painting, sculpture, and ceramics, I explore and exemplify the microscopic intricacies foundational to this theory. My pieces, organic and abstract in nature, convey extraordinarily complicated and detailed scientific principles and concepts, highlighting the science behind the theoretical concept of neuroaesthetics. (Faculty Sponsor: Dr. Sara Ishii)

4. LARGER THAN LIFE: CARE IN WOMEN LED SPACES. R. Rozelle. Arts and Design – Visual Arts

Women cultivate spaces of kinship and belonging that are defined by shared power and collective experiences, fostering environments that empower without dominating. In this presentation, I explore these themes through my recent sculpture work, Larger Than Life, examining care and power in women-led spaces. This work is informed by Emily K. Abel and Margaret K. Nelson's theories on care, particularly their concept of care within non- familial circles, which they conceptualize as sisterhood. Caring starts with the basic need to survive. From this, a genuine concern for others' well-being naturally flows from our sense of belonging to one another. In these constructed hair sculptures, I create a physical space of care, making it just big enough to feel like a comforting hug. Using concrete as a metaphor for women's complex duality—soft yet hard—I work with materiality and physical space to engage viewers in an experience of belonging and care. (Faculty Sponsor: Dr. Sara Ishii)

Session 6. Wednesday, April 23, 6:00 pm – 7:20 pm Track A (Student Union 2231)

1. PROCESSES AND RESOURCES FOR PROSPECTIVE ADOPTIVE PARENTS. M. Wilhite, N. Gillum. Human Sciences

This presentation focuses on research about adopting younger children and a pamphlet created for prospective adoptive parents. Findings about the adoption process and resources that can be beneficial during the parenting journey will be discussed. (Faculty Sponsor: Dr. Nerissa Gillum)

2. ADVOCATES FOR THE YOUTH OF TODAY: CLASSES FOR PARENTS. H. Walker, N. Gillum. Human Sciences

This presentation discusses an educational program created for parents and caregivers of youth (ages 11 years old-18 years old) who participate in a conservative religion, specifically The Church of Jesus Christ of Latter- day Saints. The goals of this program are to (1) provide a space for education, discussion, and practical application and (2) guide participants in finding ways to strengthen communication and relationships with their pre-teenage and teenage children. The three topics in the program are (a) social media use, (b) mental health, and (c) sexual health. This is a six- class curriculum complete with pre-assessments and post-assessments for each session. These assessments support the facilitator in tailoring the program to the needs of participants. The end goal of the program is to provide means for other larger groups of people to participate in these classes in order to strengthen their families and communities as a whole. (Faculty Sponsor: Dr. Nerissa Gillum)

Supported by TWU Experiential Student Scholars Program.

3. HANDI: HUMAN ADVANCEMENT THROUGH NEXT-GEN DESIGN AND INNOVATION. C. Bacidore, A. Williams, G. Hale, S. Chhuon, J. Watts. Sciences – Computer Sciences

The HANDI system approach starts by accurately scaling a pre-designed 3D prosthetic model using precise measurements from different parts of the recipient's body. This automation saves time and effort in the production of the prosthetic. On top of using a digital algorithm to automate the scaling and measurements, the HANDI system uses 3D printing technology to automate physical production as well. Using 3D printing to manufacture the prosthetic nearly guarantees that the prosthetic will have higher levels of precision and comfort for the user than a handmade prosthetic would have. Besides the practical advantages, this technology opens the door to broadened accessibility. By reducing the need for skilled manual labor, this system can allow for easier access to prosthetics for the individuals who truly need it. (Faculty Sponsor: Dr. David Gardner)

Supported by McNair Scholars Program.

4. EXISTENTIAL CRISIS IN FAMILIES. C. Hausmann. Human Sciences

A growing amount of research suggests that religion greatly impacts a person's ability to deal with loss. However, research on religiosity in the United States has discovered that Americans are becoming less religiously affiliated but are more likely to identify as spiritual on a personal level. With less religious affiliation on a public level, and more spiritual affiliation on a personal level, clinicians face an onerous task of operating as an outlet for clients who need a more spiritual take on psychological conditions specific to existential crisis. This presentation will address the current research related to this topic and provide future implications for clinicians working directly with family units facing existential concerns. (Faculty Sponsor: Dr. Rebecca LuceroJones)

5. INFORMING PARENTS ABOUT THE IMPACT OF FETAL ALCOHOL SYNDROME ON CHILDREN. A. Becker, N. Gillum. Human Sciences

Presentation will be about research conducted to inform parents on the impact of fetal alcohol syndrome (FAS) on children. An infographic will be used to share about physical, emotional, and cognitive effects that alcohol can have on children. Strategies and resources for parents to use to help with some of the challenges in raising children with FAS will be reported. (Faculty Sponsor: Dr. Nerissa Gillum)

ABSTRACTS FOR POSTER PRESENTATIONS

Abstracts are listed in the department of the faculty sponsor.

Session 1. Tuesday, April 22, 9:00 am – 10:20 am Student Union 2300 (Southwest Ballroom)

1. A PATIENT-DERIVED IPSCS STUDY TO UNDERSTAND MOLECULAR BIOLOGY AND ELECTROPHYSIOLOGY OF DLG4-RELATED SYNAPTOPATHY. P. Karmacharya, P. Varma, Z. Lybrand. Sciences – Biology

Disk Large MAGUK Scaffold Protein 4(DLG4) encodes for PSD-95, a scaffolding protein complex that plays a crucial role in the structural and functional organization of excitatory synapses by interacting with the glutamate receptors NMDAR and AMPAR. The pathogenic variants of DLG4 disrupt the expression and localization of PSD-95. The mutation has been clinically implicated in various synaptopathies, including intellectual disability (ID), global developmental disorder (GDD), autism spectrum disorder (ASD), epilepsy, and hypotonia. Understanding the molecular mechanism behind the synaptic dysfunction is crucial to developing a targeted therapeutic strategy. We are currently differentiating patient-derived induced pluripotent stem cells (iPSCs) and family-matched controls into excitatory 2D neurons. The aim is to investigate genotypic-to-phenotypic relationships that provide mechanistic insight into DLG4 synaptopathy for improved patient care. (Faculty Sponsor: Dr. Zane Lybrand)

Supported by TWU REP.

2. ANALYZING THE LOTKA-VOLTERRA MODEL IN PREDATOR-PREY DYNAMICS. O. Enslein, A. Martin, J. McKinney, N. Viveros. Sciences – Mathematics

The Lotka-Volterra model, originally developed by Alfred J. Lotka and Vito Volterra, remains a cornerstone in the study of predator-prey dynamics. This literature review explores the model's historical foundations, its mathematical formulation, and its applications in various ecological contexts. Through an analysis of key academic sources, we examine how the model has been extended beyond its original assumptions to incorporate factors such as environmental variability, functional responses, and stochastic elements. Additionally, we evaluate the strengths and limitations of the model, discussing its predictive capabilities and areas for improvement. By synthesizing contemporary research, this review aims to provide a comprehensive overview of the model's role in ecological studies and identify potential directions for future research. (Faculty Sponsor: Dr. Junalyn NavarraMadsen)

3. ENHANCING THERAPEUTIC RESPONSES: THE ROLE OF DELIBERATE PRACTICE IN MULTICULTURAL FAMILY THERAPY. T. Douglas, M. Schock, M. Kim, H. Eddy, A. Jones. Human Sciences

The study used the newly developed Facilitative Systemic Intervention Skills (FSIS) measure to rate therapist skills when responding to challenging multicultural family therapy scenarios. Simulated vignettes involved multicultural and relational elements that may arise within relationships of marginalized clients. On two consecutive days, participants watched a series of challenging vignettes of couples therapy clients presenting with multicultural issues. After each vignette, participants recorded a response to the clients as if they were their therapist, using their own personal style and approach. Our hypothesis that participants would improve their FSIS scores with repeated practice was supported. The main effect for practice was significant with a large effect, $F(3, 30) = 8.04$, $p < .001$, $n2 = .45$, demonstrating significant improvement with practice. Therapists improved with practice despite not receiving any feedback about their performance. Future research will examine how this approach impacts therapists' multicultural orientation when working with diverse clients. (Faculty Sponsor: Dr. Adam Jones)

Supported by TWU Center for Student Research.

4. EVALUATING THE SUSTAINABILITY OF MECHANOCHEMICAL SYNTHESIS FOR COPPER(I) DIAMINE COMPLEXES: A COMPARISON WITH TRADITIONAL SCHLENK METHOD. S. Banna, M. Omary, Z. Taimuri, A. Tantish, N. Canales, M. Muleta. Sciences – Chemistry and Biochemistry

Recent literature emphasizes the increasing importance of copper complexes in catalysis, biomedicine, and materials science, with applications in medicinal chemistry and the development of metal-organic frameworks (MOFs) for energy storage and gas separation. This study introduces a sustainable, green chemistry approach for synthesizing copper halide complexes using niacinamide (Vitamin B3) as a natural ligand in a solvent-free, mechanical grinding process. This eco-friendly method reduces solvent use, offering significant environmental benefits. The synthesized complexes display luminescence, indicating potential applications in optoelectronic devices, such as LEDs. Additionally, we explore their potential for use as highly sensitive environmental sensors. Characterization through photoluminescence spectroscopy, NMR, TGA, FTIR, and UV-Vis spectroscopy provides insights into their structure, thermal stability, and optical properties. This green synthesis approach, combined with the multifunctional properties of copper complexes, offers a promising pathway toward sustainable materials for technological and environmental applications. (Faculty Sponsor: Dr. Manal Omary)

Supported by Welch Foundation, TWU Jane Nelson Institute for Women's Leadership.

5. EXPLORATION OF POTENTIAL CLOSED LOOP MANUFACTURING OF BIOPLASTICS. J. Leija, G. Salazar. Sciences – Chemistry and Biochemistry

Bioplastics are the largest class of petroleum-based plastic alternatives, with most bioplastic production and consumption in the United States of America. In comparison to the lifetime of petroleum-based plastic, bioplastics seem to boast a less daunting outcome; however, some of the most common bioplastics seem to degrade into the same problematic microplastics that bioplastics were intended to solve. Thus, it is important to assess the biodegradability of such bioplastics. In this project, eight different bioplastic straws acquired from large retailers were characterized though various different methods. Of the eight samples, all were resistant to solubility, with some dissolving into water and probably arranging into oligomers; upon pyrolysis, color change and crystallization were observed outcomes. Bioplastics, alike to their predecessor, are flawed; yet, it is possible to take advantage of bioplastic's versatility in closed loop production. (Faculty Sponsor: Dr. Gustavo Salazar)

Supported by Robert A. Welch Foundation.

6. EXPONENTIAL GROWTH VS. EXPONENTIAL DECAY & APPLICATIONS OF GEOMETRIC SEQUENCE. D. Hernandez, N. Hernandez, S. Manrique, E. Grigorieva, PhD. Sciences – Mathematics

In this study we show and prove that population growth or money growth can be modeled by a single continuous formula A=P(1+r)^t and that the radioactive decay or the decline of the rabbits or deer in a forest can be modeled by a similar formula A=P(1-r)^t. We demonstrate that discrete values of population in a city or annual cash inflows to your bank account are successive members of either increasing or decreasing geometric progression. These discrete values are points on the continuous process curves. Our analysis is supported by programming in Excel. (Faculty Sponsor: Dr. Ellina Grigorieva)

7. HYDROFLUOROCARBONS: HOW HARMFUL GREENHOUSE GASES ARE AFFECTING EARTH'S ATMOSPHERE. M. Blanton, J. Strode, G. Cruz, L. Alvarado, A. Ramirez, L. Meehan, H. Kouadio. Sciences – Environmental Science

Like many people living in modern America during the summer time we have the AC running. Well, did you know that our AC units contribute to global pollution? Our AC releases harmful greenhouse gases called HFCs. Hydrofluorocarbons, or HFCs, are several organic compounds composed of hydrogen, fluorine, and carbon. They are primarily used as coolant and refrigerants found in fridges, AC units, and coolant spray cans. HFCs were originally created as an alternative to ozone-depleting substances, such as chlorofluorocarbons (CFCs). However, HFCs ended up not being a great substitution and are still causing great damage to the Earth's ozone layer. HFCs have warming properties that are much stronger than carbon dioxide even in relatively small amounts. Since they are contained inside of equipment, the emissions of HFC are due to leakage and wear in the products that contain the HFC. It is possible and essential to opt for more environmentally friendly options that exclude the use of HFCs and in this research, we aim to investigate the possibilities of ridding the world of HFCs in place of better alternatives. (Faculty Sponsor: Dr. Halima Kouadio)

8. INVESTIGATING TADARIDA BRASILIENSIS' TRIPS TO TEXAS. O. Oluwadare. Sciences – Biology

Tadarida brasiliensis are the fastest bats on the planet and migrate throughout the year. Our goal was to investigate what months and counties Mexican free-tailed bats are observed the most in Texas. We received research grade data on 09/13/24, from iNaturalist. The location and date range was Texas; 08/31/15-08/31/24. We observed 1,309 total sightings in Texas over 9 years, with the most observations in April (183) and August(189). The highest counts were seen in Williamson, Travis, Comal, and Bexar counties; 100 total sightings. These counties are located in the Balcones Fault Zone, a region with many caves, and a preferable climate for this species. Sighting decreased during fall and winter months presumably because they fly to South America for hibernation. White-nose syndrome is a disease that plagues many bat communities, and further observation would help them survive. (Faculty Sponsor: Dr. Ann Marie Davis)

9. INVESTIGATING THE ROLE OF CHOLESTEROL METABOLISM IN AMYLOID PRECURSOR PROTEIN PROCESSING, TAU HYPERPHOSPHORYLATION, AND NEUROFIBRILLARY TANGLE FORMATION IN B35 NEUROBLASTOMA CELLS. M. Tabassum, D. Hynds. Sciences – Biology

Alzheimer's disease (AD) is recognized by amyloid-beta (Aβ) accumulation and tau hyperphosphorylation, both impacted by cholesterol metabolism. We hypothesize that altering cholesterol levels modifies amyloid precursor protein (APP) processing and tau phosphorylation, influencing neurofibrillary tangle (NFT) formation. To validate this, cultured B35 neuroblastoma cells will be treated with cholesterol-modulating agents, and APP cleavage, Aβ production, and tau phosphorylation will be evaluated through biochemical assays. We project that elevated cholesterol will stimulate amyloidogenic APP processing and tau hyperphosphorylation, while cholesterol reduction will attenuate these effects. These analyses could provide insights into cholesterol-targeted treatment strategies for AD prevention and intervention. (Faculty Sponsor: Dr. Dianna Hynds)

10. IR ANALYSIS OF MICROPLASTICS IN FINGERPRINTS. O. Barclay, J. Beatty. Sciences – Chemistry and Biochemistry

Ingestion of microplastics poses a significant threat to human health and the environment. One route of ingestion is through adhesion to fingers, especially when handling food that has been cooked and packaged in plastic containers.

Microplastics can adhere to the skin and be transferred within the ridges of human fingerprints. Polyethylene and polystyrene are the most common compounds used to make plastics and can easily be detected through IR (infrared) analysis. These materials show strong absorbance in IR, which can be used to distinguish them from other compounds, such as natural oils found on the skin. This technique has applications in environmental and forensic chemistry, as identifying sources of microplastics can help mitigate their health hazards. This research uses the iN10 IR microscope to analyze fingerprints for microplastic contamination and employs a simulated latex finger to obtain consistent transfers of microplastics in fingerprints. (Faculty Sponsor: Dr. John Beatty)

Supported by Robert A. Welch Foundation, TWU Center for Student Research, TWU Jane Nelson Institute for Women's Leadership.

11. ORGANIC POLLUTANT ADSORPTION ON SYNTHESIZED METAL ORGANIC FRAMEWORKS: A COMPUTATIONAL INVESTIGATION. M. Mapula, S. Lin, M. Omary. Sciences – Chemistry and Biochemistry

Metal-organic frameworks (MOFs) are a type of porous material consisting of metal nodes connected by organic linkers. MOFs have unique properties such as high surface area, tunable pore size, and the ability to selectively adsorb small molecules, making MOFs promising candidates for various applications including removing pollutants. In our study, we've gathered MOFs from the QMOF database to determine which of the selected MOFs are best suited for organic pollutant (BTEX Compounds, Linear and Cyclic Siloxanes) adsorption. We applied computational chemistry methods to investigate interaction of organic pollutants and our selected MOFs which can guide the design and modification of MOFs for organic pollutant absorption and removal. (Faculty Sponsor: Dr. Shiru Lin)

Supported by National Science Foundation.

12. PERCEPTION OF YOUNG ADULT PICKY EATING AMONG TEXAS WOMAN'S UNIVERSITY STUDENTS. J. Truong. Nutrition and Food Sciences - Denton

Objectives: To examine characteristics of picky eating (PE) and concerns faced by self-identified young adult picky eaters at TWU. Methods: A survey featuring the validated Adult Picky Eating Questionnaire (APEQ) and questions assessing perception of PE was distributed to students. Results: The APEQ found that students' PE was mainly characterized by concerns with food variety and meal presentation. Regarding PE perception, most participants felt a degree of judgement for their eating behaviors, but were generally comfortable with others, typically family and friends, knowing about their PE. Expression of PE may be selective when dining out. Most students were concerned about how PE affects their health while also feeling capable of maintaining a healthy diet. Conclusions: Traits of PE beyond food rejection and food neophobia are important to assess as adult PE relates to health, nutrition, and psychosocial concerns. Future research can account for this to develop health and nutrition interventions. (Faculty Sponsor: Dr. Kathleen Davis)

13. THE CIVILIAN CONSERVATION CORPS IN TEXAS STATE PARKS: EDUCATION DURING THE GREAT DEPRESSION. M. Adams. Social Sciences and Historical Studies

This research examines the role of the Civilian Conservation Corps (CCC) in Texas, focusing on how the program's conversational efforts inadvertently served as a vehicle for forms of education during the Great Depression. Although the CCC's mission emphasized land conservation, historical preservation, and infrastructure development, it also served to provide for America's men during the Great Depression. By drawing on case studies of specific Texas CCC camps, such as Garner and Bastrop, this research highlights how the CCC offered Texas a lifeline during the Great Depression, addressing the twin crises of unemployment and education. Going beyond the benefit of employment, the CCC significantly impacted the enrollee's lives by offering education and vocational training. Through academic and vocational courses, the CCC's educational programs within Texas State Parks prove to be effective, both academically and economically. (Faculty Sponsor: Dr. Katherine Landdeck)

Supported by TWU Honors Program.

14. THE EFFECT OF MENSTRUAL CYCLE PHASE ON IGF-1 AND MYOSTATIN AFTER AN ACUTE BOUT OF ANAEROBIC EXERCISE: A PRELIMINARY ANALYSIS. K. Lambright, C. Clark, A. Latchford, D. Newmire. Kinesiology

PURPOSE: The purpose of this study is to investigate the effects of menstrual cycle phases on insulin-like growth factor-1 (IGF-1) and myostatin (GDF-8) in response to a bout of anaerobic exercise. METHODS: Four eumenorrheic women age 21.5±3.3 years, height of 157.9±7.6 cm, weight 60.5±10.2 kg, and BMI 24.1±2.9 kg/m² tracked their menstrual cycles for two months prior to the exercise sessions. Participants completed a Wingate test during three menstrual cycle phases including early follicular (EF), late follicular (LF), and mid-luteal (ML) with pre- and post-exercise blood samples collected to measure serum IGF-1 and myostatin levels. RESULTS: In IGF-1 serum concentrations, no significant effect was found ($p>.05$). Myostatin serum concentrations had no significant effects ($p>.05$). CONCLUSION: Although further investigation with a larger sample size is warranted, results of this study indicate that there are no changes in IGF- 1 and myostatin serum concentrations between menstrual cycle phases or time points post-Wingate test. (Faculty Sponsor: Dr. Daniel Newmire)

Supported by TWU Center for Student Research.

15. USING GEOMETRIC PROGRESSION TO MODEL RADIOACTIVE DECAY, POPULATION GROWTH, AND ANNUAL SALES. R. Donehoo, H. Collie, E. Grigorieva, PhD. Sciences – Mathematics

At first glance, topics such as radioactive decay, population growth, and annual sales may seem unrelated. However, they share common characteristics in terms of rates of change and long-term behavior. This study explores how these phenomena can be modeled using mathematical concepts like geometric progressions. For example, stores often apply markdowns on products in successive percentages, such as 50%, 40%, and 25%, creating a scenario where the final discount follows a geometric progression. By modeling the discount process, we can predict the overall price reduction and avoid errors in calculating the final selling price. Similarly, radioactive decay follows a fixed decay rate, with substances decreasing by half after a fixed period, known as the half-life. This decay also forms a geometric progression, with a common ratio of (1 - r), where r represents the decay rate. The study aims to draw connections between these processes and explores their applications in different fields, demonstrating how exponential functions and geometric progressions can describe a wide range of real-world phenomena. (Faculty Sponsor: Dr. Ellina Grigorieva)

16. WHAT TO EXPECT IN 2025? THE MAGIC OF THE NUMBER 2025. S. Carrillo, A. Jalomo, C. Elaiho, E. Grigorieva. Sciences – Mathematics

Since ancient times, natural numbers have attracted people with their magic. The ancient Greeks have explained natural numbers through life expectancy, harvest, health, and success. They knew how to factor numbers and rewrite numbers as squares or as the sum and difference of other numbers. In addition, many natural numbers have unique properties. For example, the current year 2025 is a perfect square of 45. 2025 can also be written as a sum of two squares. Because 45 can be written as the sum of the first nine natural numbers, then, by squaring this sum, we get 2025. Having knowledge of mathematics helps us find and prove additional properties of 2025. In this study, we show how most of the properties of natural numbers could be explained in Ancient Greece and Ancient Babylon 2000 BC and how it can be done in present time. (Faculty Sponsor: Dr. Ellina Grigorieva)

17. THE UNSILENCING OF CHILDREN: A STUDY EXAMINING SCHOOL CLIMATE, ANXIETY AND STRESS IN ELEMENTARY SCHOOL CHILDREN. A. Messer. Early Childhood Education

The purpose of this critical phenomenological qualitative study was to examine how school climate impacts children's lived experiences with stress and anxiety during the school day. Bronfenbrenner's bioecological theory of human development (1986), Maslow's hierarchy of needs (1943), and Freire's pedagogy of humanization (2018) served as the frameworks for this study. A snowball sample of elementary students enrolled in third, fourth, and fifth grades within charter, private, and public schools in Texas was interviewed using a semi-structured protocol. Interview questions aligned with Texas Education Code 38.351's definition of school climate that encompassed teacher relationships, teaching and learning practices, and organizational structures. Interview transcriptions were analyzed through elemental and affective coding (Saldana, 2021) in AtlasTi. Findings focus on children's emotional wellbeing during the school day. Suggestions for changes in school policies and areas for future research are recommended. (Faculty Sponsor: Dr. Lin Moore)

18. THE DYNAMIC PALMITOYLATION IN HEPATOCELLULAR CARCINOMA: PROTEIN PROFILING. C. Jin. Nutrition and Food Sciences - Denton

Hepatocellular carcinoma (HCC) is a highly lethal malignancy. Protein palmitoylation, a reversible lipid modification regulated by ZDHHC-type palmitoyltransferases and α/β-hydrolase domain (ABHD) depalmitoylases, plays a crucial role in oncogenic signaling and tumor progression. However, the regulation of dynamic palmitoylation in HCC remains unclear. Based on our previous study using HEK293A cells to characterize the global protein palmitoylation, which identified over 1500 highly palmitoylated proteins, we overlapped these protein targets with the HCC cancer genes and mutations in The Cancer Genome Atlas (TCGA) database, we have identified 63 cancer genes and their corresponding proteins are palmitoylated, and 281 mutated genes and their corresponding proteins are palmitoylated. We have repeated the experiments and found that the cancer proteins, such as GNA11, GNA13, RRAS, HRAS, GNAQ, PTPN11 are highly palmitoylated, as well as the mutant proteins, i.e., SRIB, SLC1A5, ZDHHC6, SLC5A6, and IGF2R. In future study, we will uncover the dynamic palmitoylation regulatory enzymes and pathway, which may provide novel therapeutic strategies for HCC. (Faculty Sponsor: Dr. Zhipeng Tao)

Supported by TWU Experiential Student Scholars Program.

19. PRESENT AND FUTURE VALUE OF ANNUITY: MORTGAGE AND COLLEGE SAVING PLANS AS APPLICATIONS OF GEOMETRIC SERIES. G. Vasquez, M. Enders, E. Grigorieva, PhD. Sciences – Mathematics

What is the current value of an annuity? What is the future value of an annuity? In this study, we learned that the answers to these questions can be explained and obtained using geometric series. How to not be deceived when buying a new house. What should be taken into account when applying for a mortgage of 15, 20 or 30 years? Want to save money for college for your children? What should you do? Is it better in the end to save regularly (monthly or annually) or invest one large sum at once and wait 10 or 15 years? In this research, we studied everything analytically, and then used a graphing calculator and programming in Excel to support our results. (Faculty Sponsor: Dr. Ellina Grigorieva)

20. ORIGINS AND DEVELOPMENT OF THE SET OF REAL NUMBERS. S. Arnett. Sciences – Mathematics

The research project focuses on the origins and development of the set of real numbers, which considers the evolution of the real number system as an integral part of its history. The

mathematical theories presented, like Dedekind cuts and Cauchy sequences, help give an explanation to why the real number system is a complete system. This historical analysis is for investigating subsets nesting inside of other sets to eventually encompass the set of real numbers. (Faculty Sponsor: Dr. Junalyn NavarraMadsen)

21. MARKET EQUILIBRIUM: SUPPLY AND DEMAND. BREAK-EVEN POINT: REVENUE VERSUS COST. M. Moreno, L. Rodriguez, O. Harrison, A. Rupani, E. Grigorieva. Sciences – Mathematics

We all want to make a profit. For example, if we sell ice cream for $5 each, it does not mean that if we sell 1,000 of those ice creams, our profit will be $5,000. We must pay wages, pay for electricity, and also spend money to make ice cream. So, $5,000 is our total revenue, but profit is total revenue minus total costs. When our revenues equal our costs, we have zero profit or break even (BE) point. Graphically, BE point is the intersection of the revenue and cost curves. We can see similar mathematical behavior if we study the supply and demand of a product. If the price of, say, boots is high, few people buy those boots. When the price falls, the demand for boots increases. The retail store, on the other hand, does not want those boots to fall to a certain price and will want to sell them at a higher price. When the supply and demand curves intersect, the market equilibrium (point ME) is reached. In this study, we examined various market and production scenarios and developed recommendations for optimal business plans. (Faculty Sponsor: Dr. Ellina Grigorieva)

22. INVESTIGATING THE ROLE OF TART CHERRY FORMULATED DIET ON CARTILAGE HEALTH IN A RAT MODEL OF OSTEOARTHRITIS. K. Crabtree, S. South, P. Vijayagopal, D. Averitt, S. Juma. Nutrition and Food Sciences - Denton

This study investigated whether whole tart cherries incorporated into a formulated diet positively impacted cartilage metabolism in osteoarthritis (OA) rat model. Thirty CD rats were injected with monosodium iodoacetate (MIA) to induce joint destruction, and 10 rats served as control. After acclimation, the MIA animals were randomized into three groups: MIA, 5% Tart Cherry (TC), and 10% TC. The diet was followed for 48 days in all groups. After this, rats were euthanized, and cartilage tissues were obtained for examination. Blood was collected with serum separated and stored for analysis. Histological findings indicate increased inflammatory infiltration in MIA rats, which was reversed in the TC groups. Serum pro- inflammatory IL-10 levels were higher in MIA versus control and TC groups. Gene expression for MMP3 was dose-dependently downregulated in TC groups versus MIA. These results suggest that whole tart cherry may be a therapeutic alternative for alleviating OA-associated joint damage (Faculty Sponsor: Dr. Shanil Juma)

Supported by Cherry Marketing Institute; TWU REP.

23. INVESTIGATING THE EFFECTS OF LACTIC ACID BACTERIA FERMENTATION ON PHYSIOCHEMICAL PROPERTIES OF PLANT-BASED PROTEINS AND FLOURS. T. Parveen, D. Wang. Nutrition and Food Sciences - Denton

Plant-based proteins are increasingly recognized for their nutritional benefits and environmental sustainability. However, the application of plant proteins in the food industry is limited due to their relatively low functional properties, digestibility, and sensory aspects. This research aims to investigate the effects of lactic acid bacteria (LAB) fermentation on the physicochemical properties of plant-based proteins (soy, pea, chickpea, and fava bean) and their flours. Two LAB strains Lactococcus lactis and Lactobacillus plantarum were studied for protein fermentation with two different carbon sources. Physicochemical properties including pH, titratable acidity (TA), Brix, water holding capacity, texture, and viscosity were analyzed. Results showed pH was significantly reduced with an increase of TA for all fermented samples. There was a significant texture improvement and viscosity increase for soy protein. These findings highlight the potential of LAB fermentation to optimize plant-based ingredients, improving their texture and stability, which has promising impact in food industry applications. (Faculty Sponsor: Dr. Danhui Wang)

Supported by TWU Experiential Student Scholars Program, QEP Graduate Student Research Grant (TWU Jane Nelson Institute for Women's Leadership), TWU Center for Student Research.

24. INVESTIGATING MECHANISMS OF CYTOMEGALOVIRUS INDUCTION OF ALZHEIMER'S DISEASE MARKERS. C. Rodriguez, L. Hanson. Sciences – Biology

Alzheimer's disease (AD) is characterized by increased production of amyloid beta (Aβ) peptides and hyperphosphorylation of tau proteins. Our previous studies have demonstrated that mouse cytomegalovirus (MCMV) infection elevates tau phosphorylation. This study aims to investigate whether MCMV also influences Aβ1-42 levels and to elucidate the underlying mechanisms. We will infect B35 rat neuroblastoma cells with MCMV and collect supernatant and cell lysates at 24, 36, 48, and 72 hours post- infection. Quantification of intracellular and extracellular Aβ1-42 levels will be performed using ELISA, comparing results to mock-infected controls. Additionally, we will assess the levels of protein kinase PKA and other candidate kinases through western blot analysis at time points between 24, 48 and 72 hours to determine the level of this protein and know if there are changes after infection. Understanding how MCMV affects these key proteins may reveal viral contributions to neurodegeneration and identify potential therapeutic targets. (Faculty Sponsor: Dr. Laura Hanson)

Supported by TWU Center for Student Research.

25. HOW TO MAXIMIZE PROFIT OR CHOOSE THE BEST DIETARY SUPPLEMENTS? SOLVING BUSINESS AND INDIVIDUAL CHALLENGES USING LINEAR PROGRAMMING.

A. DeRieux, N. Campbell, E. Grigorieva. Sciences – Mathematics

Optimization problems are everywhere, in business and everyday life. Companies want to boost profits while keeping costs low, people set weight loss goals and try to stick to a plan, and pet owners work to give their pets a balanced diet for better health. The challenge in all these situations is figuring out the best possible outcome while dealing with various limitations. That's where Linear Programming comes in. This mathematical approach helps find the most efficient solutions by working within given constraints. In this paper, we explore different real-world applications of optimization, including production planning, financial decisions, and meal scheduling. Using Linear Programming we create mathematical models and investigate them analytically and numerically using computer programs in Excel and Maple. (Faculty Sponsor: Dr. Ellina Grigorieva)

26. EXPLORING THE ROLE OF ESTROGEN IN UVEAL MELANOMA: A PATHWAY TO PERSONALIZED TREATMENT FOR WOMEN. Q. Yuan, Z. Tao, C. Jin. Nutrition and Food Sciences - Denton

Uveal melanoma (UM) is the most common intraocular tumour in adults worldwide, mainly affecting Caucasian populations. Protein palmitoylation, a dynamic post-translational lipid modification, regulates protein stability, localization, and signaling. Development of uveal melanoma (UM) is strongly associated with lipid metabolism. Analysis of The Cancer Genome Atlas (TCGA) database indicates that high mobility group box 3 (HMGB3) expression increases in UM, which is highly palmitoylated. Additionally, estrogen levels in postmenopausal states or related syndromes are known to influence lipid metabolism, further suggesting a hormonal-lipid interaction in UM progression. In our study, we found that HMGB3 undergoes significant palmitoylation in vitro, which could be a gap bridge with lipid metabolism in UV melanoma. Future research will focus on elucidating the estrogen- HMGB3 axis in UM to better understand its role in tumor progression and identify potential therapeutic targets. (Faculty Sponsor: Dr. Zhipeng Tao)

Supported by TWU REP.

27. EXPERIMENTAL EFFICIENCY: HOW MACHINE LEARNING ESTIMATIONS STREAMLINE CATALYTIC DENSITY-FUNCTIONAL THEORY CALCULATIONS. L. Orozco, S. Castillo, S. Lin. Sciences – Chemistry and Biochemistry

Density-Functional Theory (DFT) is a system of quantum calculations that provide information on the ground state of many forms of atomic systems, particularly with compounds and crystals. Despite the decades of refinement of these formulas, strictly mathematical DFT calculations cannot be effectively used for larger and more complicated structures due to outside factors that cannot be easily computed using the formula. In this case, use of machine learning (ML) can easily consider how similar compounds consider these factors, such as electron affinity (EA), ionization energy (IE) and radius (r), along with the potential reactants of an experiment to output the most optimized set of those reactants. Using previously conducted research, I will explain how ML is used to predict optimized DFT calculations, and how ML can be used positively in the experimental space to save time and funding to create the most optimal experiment to then conduct testing on. DFT and ML methods and algorithms and their error metrics are also used to determine which of these metrics produce the most consistently accurate results without losing efficiency. (Faculty Sponsor: Dr. Shiru Lin)

28. ESCAPE THE BURNOUT. M. Chonody. Nursing - Dallas

Burnout has gained significant attention in healthcare, especially nursing, following the pandemic. Recognizing the signs and symptoms of burnout early, along with implementing preventive measures, can reduce its effects on nurses, patients, and the healthcare system, which could also help address the global nursing shortage. This project aims to educate nursing students about recognizing burnout and creating preventive strategies through a virtual interactive experience. This experience comprises a pre- activity survey, an escape room focused on burnout recognition and prevention, and a post-activity survey to gauge understanding. This initiative is vital for the well-being of nurses and the health of the healthcare system and patients. By increasing awareness of nurse burnout, we aim to foster meaningful changes within healthcare organizations by increasing awareness of nurse burnout. (Faculty Sponsor: Dr. Cecilia Wilson)

29. APPRECIATION AND DEPRECIATION. LINEAR OR EXPONENTIAL? V. Serafin, S. Steward, J. Garcia, E. Grigorieva. Sciences – Mathematics

Every year we hear that something is going up or down in price. For example, if you buy a house in a good location, it is clear that every year the price of the house will go up, sometimes this price goes up linearly, and then we say that it is a linear appreciation. On the other hand, if we consider the city of Denton, the population will grow exponentially with a certain rate of population growth. What happens if we buy a BMW, a fairly expensive car, the price at which we can sell it next year will be much lower, and if we notice that the price goes down by a certain amount of dollars, then in this case it is a linear depreciation. However, for a radioactive substance, its quantity regularly decreases exponentially. In fact, it decreases by half every half-life! In this study, we look at different phenomena to understand how to model a certain process, linearly or exponentially. (Faculty Sponsor: Dr. Ellina Grigorieva)

30. A SCOPING REVIEW OF CONCUSSION RESEARCH ON FEMALE ATHLETES. J. Collicutt, A. Verdin. Human Sciences

Female athletes are more likely to sustain a concussion

playing sports yet are underrepresented in the extant literature. The purpose of this scoping review is to map the existing literature on female athletes and concussions, and identify key themes and gaps in knowledge. Database searches were conducted using the terms "female athletes or women athletes" AND "concussion" AND "female athlete concussion," yielding a total of 15 articles. A synthesis table was used to compare and contrast relevant findings. The findings were categorized into three themes. The first theme found that female athletes experience longer symptom duration and a longer recovery time. The second theme showed inconsistent findings on sex differences. A preliminary third theme, athlete support, has emerged, and confirmability is in progress. The findings show a lack of research on female athletes with concussions and the need for more research. (Faculty Sponsor: Dr. Azucena Verdin)

Session 2. Tuesday, April 22, 2:40 pm – 4:00 pm Student Union 2300 (Southwest Ballroom)

1. A SUSTAINABLE SHIFT TO HYDROFLUOROOLEFINS CAN REDUCE GLOBAL WARMING POTENTIAL. F. Jimenez, M. Zuniga, N. Hernandez, S. Schaloff, K. Bates, A. Perkins, H. Kouadio. Sciences – Environmental Science

Hydrofluorocarbons (HFCs), have been commonly used as propellants and refrigerants due to their low ozone depletion potential. However, they are a potent greenhouse gas with a high global warming potential (GWP), making them a major contributor to climate change. In turn, we have aimed to research alternatives for HFCs; we hypothesize that hydrofluoroolefins (HFOs) could be a green alternative due to its higher energy efficiency and productivity. This study will investigate the environmental benefits of HFOs, their GWP, and any possible impact to the ozone when compared to harmful HFCs. By conducting a comparative analysis of their life cycle emissions and efficiency, the transition to HFOs could significantly reduce the impact of refrigerants and support further strategies on combating global warming. (Faculty Sponsor: Dr. Halima Kouadio)

2. AN ATTACHMENT FOCUSED REVIEW OF PARENT-ADOLESCENT EMOTIONAL RELATIONSHIPS POST-DIVORCE. K. Pedford, U. Maryam, S. Hwang. Human Sciences

Abstract: This study explores the emotional impact of parental divorce or separation on adolescent emotional attachment and parent-child relationships. Using the attachment theory, it can provide an understanding of how these family changes impact emotional development in adolescence. Through a qualitative focus group session with young adults the study inspects how adolescents emotionally are impacted post-divorce or separation. This study will examine the essential need of strong support in parental figures in maintaining a secure attachment relationship. Findings may show that adolescents experience changes in emotional, physical, and social experiences in life. Based on the conclusions the study will provide suggestions that strengthen parent-adolescent relationships and promote emotional stability. By using a smaller number of participants this study will investigate the need for fostering emotional stability and effective communication in post- divorce or separated family environments. (Faculty Sponsor: Dr. Shann-Hwa Hwang)

3. ANALYZING A UV-INDUCED CALCIUM-DEPENDENT PATHWAY THAT CAUSES CHROMATIN COMPACTION AND DNA PROTECTION IN HUMAN MELANOCYTES. T. Ladell, R. Sinha Roy, M. Enriquez, M. Bergel. Sciences – Biology

Skin cancer is the most common cancer. Exposure to ultraviolet (UV) radiation can damage cellular DNA, leading to mutations and an increased skin cancer risk. Human cells, including melanocytes, the pigment-producing cells in the skin, have mechanisms to respond to UV radiation, including chromatin remodeling for DNA protection. Recent studies suggested that calcium plays a critical role in modulating cellular responses to UV radiation. This study investigates a calcium-dependent pathway involving P2RY6 and SSTR4 receptors that induces UV-dependent chromatin compaction and enhances DNA protection in melanocytes. We show that UV exposure leads to chromatin compaction and gene stability, by increasing intracellular calcium, activating P2RY6 and SSTR4 signaling, and increasing their transcription levels (based on RNA-sequencing). Our goal is to corroborate these results by Western blotting and RT-qPCR. Our findings highlight the role of calcium-dependent pathways in maintaining DNA integrity, providing insights into potential skin cancer prevention strategies. (Faculty Sponsor: Dr. Michael Bergel)

4. CAN PARENTAL EDUCATION BE AN EFFECTIVE TOOL IN REDUCING SCREEN TIME USE IN YOUNG CHILDREN? D. Fontenette. Teacher Education

Excessive screen use in young children is increasingly linked to negative developmental outcomes, including delayed cognitive, language, and motor skills, as well as increased likelihood of Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), and obesity. Despite the American Academy of Pediatrics' recommendation of zero screen exposure for children under eighteen months (except for video calls), screen usage continues to rise. This integrative literature review explores the impact of excessive screen time on child development and examines the effectiveness of parental training in mitigating these effects. The review synthesized findings from 25 articles, from comprehensive database searches, focusing on children aged 1 to 6. Results indicate that parental education programs can significantly reduce screen time and enhance language development. Additionally, informed parental involvement, such as co-viewing, positively influences child development. These findings underscore the urgent need for targeted parental education initiatives to foster healthier screen habits in young children. (Faculty Sponsor: Dr. Randa Keeley)

5. EFFECTIVENESS OF VOCABULARY ACQUISITION MODEL IN A READING CLASSROOM. C. Barnet. Teacher Education

The Vocabulary Acquisition (VA) model has been proposed as an effective way to enhance vocabulary skills. This model, comprising five key principles, emphasizes aligning word knowledge goals with teaching techniques resulting in fostering independent word learners. This study will investigate the effects of the implementation of the VA model into the lives of the students in my fifth grade reading classroom. My class will be divided into two groups, the treatment group and the control group, to gauge the effectiveness of this intervention. The treatment group will use the pretest, discussion of spellings and meanings, evaluation of commonalities through think-pair-share, and selecting and using authentic texts to support integration of vocabulary. (Faculty Sponsor: Dr. Ludovic Sourdot)

6. EXPLORING CHEMICAL INHIBITORS TO MODULATE PROTEIN DEGRADATION. R. Islam, R. Dasgupta, C. Brower. Sciences – Biology

The N-degron pathway, a specialized pathway of the ubiquitin-proteasome system, degrades proteins based on their N-terminal residues. A key regulator of this pathway is arginylation, a post-translational modification in which arginyltransferase 1 (ATE1) catalyzes the conjugation of arginine to proteins with acidic N-terminal residues, promoting their degradation. Loss of ATE1 has been linked to disruptions in fat metabolism and the clearance of protein fragments associated with neurodegeneration. Thus, inhibiting ATE1 may offer therapeutic potential for neurological disorders and obesity. Here, we are investigating chemical compounds that may act as ATE1 inhibitors and evaluating their effects on protein degradation using reporter systems that measure ATE1 activity directly or indirectly. (Faculty Sponsor: Dr. Christopher Brower)

7. FREE ENERGY OF ACTIVE SITE RESIDUES 147-152 IN GLUTATHIONE SYNTHETASE. M. Stankus. Sciences – Chemistry and Biochemistry

Glutathione (GSH; γ-glutamylcysteinylglycine) is the most abundant intracellular antioxidant and is synthesized via two sequential, ATP- dependent enzymes: γ-glutamylcysteine synthetase (γGCS) and glutathione synthetase (GS). While regulation of γGCS is well characterized, less is known about human GS (hGS). In this two-step process, heterodimeric γGCS first ligates cysteine to glutamate, and hGS subsequently adds glycine to γ-glutamylcysteine to form GSH. Mutations in hGS impair GSH biosynthesis. Our previous work identified several loops (G, A, S, H) surrounding hGS's active site that are essential for catalysis. Here, we focus on conserved Ser and Thr residues in the H-loop (147-TISASF-152), proposing that these residues facilitate substrate binding and catalysis. Molecular dynamics simulations reveal that while single mutations minimally affect hGS–GSH binding free energy, double and triple mutations significantly disrupt the electrostatic network, reducing catalytic efficiency. These findings underscore the H-loop's essential role in hGS structure and function, offering insights into mechanisms of GSH deficiency disorders. (Faculty Sponsor: Dr. Mary Anderson)

Supported by Welch Foundation.

8. HEALING THROUGH CREATIVITY: EXPRESSIVE ARTS THERAPY FOR SUPPORTING THE MENTAL HEALTH OF UNDOCUMENTED INDIVIDUALS. I. Luna, S. Iqbal, D. Shirinian. Human Sciences

Undocumented individuals face heightened stress due to uncertainty about their living situation, socio-economic barriers, and fear of deportation, often leading to isolation, anxiety, and depression. Expressive arts therapy offers a nonverbal, culturally responsive approach that helps individuals process emotions beyond traditional talk therapy. Techniques such as visual arts, poetry, movement, and psychodrama provide a safe space for self-expression and storytelling. Grounded in trauma-informed care, this conceptual presentation explores the role of expressive arts in addressing the mental health needs of undocumented individuals. It will also highlight ethical and cultural considerations, including confidentiality concerns and accessibility in clinical practice. Attendees will gain insight into practical expressive arts interventions that foster healing and resilience. (Faculty Sponsor: Dr. Diana Rodriguez)

9. IMMUNE CELL POPULATION INCREASES IN THE TRIGEMINAL GANGLIA FOLLOWING OROFACIAL INFLAMMATION. A. Basnet, T. Hickman, L. Hanson, S. Sinha, D. Averitt. Sciences – Biology

Orofacial pain is 2-4x more common among women than men with estrogen evidenced to play a role in sex differences. We recently reported that estrogen enhanced several key proinflammatory mediators released from IC-21 and J774A.1 macrophage cell lines. Inflammatory orofacial pain is linked to immune cell infiltration, including macrophages, into the trigeminal ganglia (TG). Estrogen polarization of macrophages at TG may influence the timing and activation state of other immune cell types. We hypothesize that immune cell population changes in the TG of male and female rats following orofacial inflammation. Using flow cytometry, we characterized immune cells in TG of female rats after masseter muscle inflammation. Preliminary data indicates macrophage population increases by day 3, with ongoing assessments at 5,7 and 14 days. These data will contribute knowledge of immune cell dynamics in TG of male and female rats, serving as a basis for studying sex differences in neuroimmune interaction. (Faculty Sponsor: Dr. Dayna Averitt)

Supported by NIH NIDCR R15 DE025970.

10. INFLUENCE OF MATERNAL SEPARATION STRESS ON MICE WITH KNOCKOUT OF MECP2 IN POMC NEURONS. H. Randel, P. Frayre, E. Na. Social Work, Psychology, and Philosophy

Methyl-CpG binding protein 2 (MeCP2) is a neuroepigenetic factor implicated in obesity pathophysiology. Forebrain knockout (KO) of MeCP2 leads to an overweight phenotype in mice exposed to a high-fat diet. Our lab recently showed that knocking out MeCP2 in pro-opiomelanocortin (POMC) neurons of the hypothalamus also results in an overweight phenotype and elevated plasma corticosterone, a stress hormone that can become harmful when chronically high. Based on these findings, we investigated whether POMC-Cre MeCP2 KO mice are more sensitive to early life stress (ELS) using a maternal separation (MS) model. Behavioral assessments and immunoassays evaluated depression- and anxiety-like behaviors in KO and wild-type (WT) mice. Our data suggest ELS MS induces anxiety-like behavior in WT mice, while POMC-MeCP2 KO mice may be resistant to ELS MS effects on anxiety and depression. This resistance may stem from endocrine changes that blunt maternal stress effects. (Faculty Sponsor: Dr. Elisa Na)

Supported by NIH NIGMS SC1GM144190 and TWU REP.

11. INVESTIGATING THE ROLE OF RHESUS CYTOMEGALOVIRUS (RHCMV) PROTEINS IN HOST CELL SIGNALING. O. Sana, S. Pathak, C. Horn, D. Streblow, D. Malouli, K. Früh, J. Spencer. Sciences – Biology

Human Cytomegalovirus (HCMV), a member of the Herpesviridae family, is highly prevalent in the general population and establishes lifelong latency. Although typically asymptomatic, HCMV can cause serious disease in immuno-compromised individuals including transplant patients and neonates. Cytomegalovirus is highly species-specific making it a challenge to study and develop vaccines in most animal models. Due to its similarities with HCMV, Rhesus macaque cytomegalovirus (RhCMV) has emerged as an ideal model for vaccine studies. RhUS28, a homolog of HCMV US28, contains 5 gene repeats. Previous studies found that two of these genes, Rh214 and Rh220, promote protective immune responses in RhCMV-based vaccine studies in monkeys. Here, we aim to identify cellular targets of Rh214 and Rh220 in RhCMV-infected cells. The goal is to understand the role of these viral proteins in host cell signaling and protective immune responses, which will help pave the way for a vaccine against HCMV (Faculty Sponsor: Dr. Juliet Spencer)

12. MORPHOLOGICAL CHANGES INDUCED BY HCMV INFECTION OF BREAST CANCER CELLS. I. LaRue, E. Garcia, A. Martins, J. Spencer. Sciences – Biology

Human Cytomegalovirus (HCMV) is a member of the herpesvirus family that evades the host immune system and establishes life-long latency. While HCMV typically causes clinical disease only in immunocompromised people, it may contribute to chronic conditions, reduce immune function, and promote tumor progression. We evaluated cell morphology, virus titer, and cmvIL-10 production. While non-cancerous cells showed clear cytopathic effects following HCMV infection, breast cancer cells did not exhibit morphology changes or undergo cell lysis. These results suggest that HCMV infection may proceed differently in tumor cells compared to non-cancerous cells, possibly due to genetic mutations or abnormal tumor cell physiology. Tumor cells seem to have a lower infection rate compared to the other cell types. These findings demonstrate that HCMV infection of breast cancer cells has complex effects that may contribute to tumor progression. These results help to better understand how HCMV affects cell morphology, virus production, and potential modulation of host defense. (Faculty Sponsor: Dr. Juliet Spencer)

Supported by TWU Center for Student Research and the Paup Graduate Fellowship (to ECG).

13. REALIZING GROUPS OF ORDER 2^N VIA GROUPS OF UNITS. J. McKinney, A. Martin, E. Arellano, A. Hardesty. Sciences – Mathematics

The Fundamental Theorem of Finite Abelian Groups describes the possible structures of finite abelian groups of a certain order. In this research, we investigate which structures of abelian groups of order 2^n are realized as groups of units, up to n=31. To identify these groups of units, we utilize Fermat primes from number theory. For each value of n, we calculate what percent of structures are realized as groups of units, analyzing how the percentage changes as n increases. Additionally, we provide a database of generators for each group of units up to n=15, which corresponds to the second largest Fermat prime. (Faculty Sponsor: Dr. Alexis Hardesty)

Supported by TWU PRIME, TWU CAS Summer Research Grant.

14. THE EFFICIENT AMPLIFICATION OF PLASMID HMGB3. L. Rodriguez, C. Jin, Q. Yuan, Z. Tao. Nutrition and Food Sciences - Denton

A plasmid DNA isolation kit has variables that we tried to modify to improve the quality and efficiency of plasmid DNA amplification. High Motility Group Box 3 (HMGB3) is a protein that is present in most cellular DNA processes and is important for the immune system. Amplification of HMGB3 plasmid DNA would help to study its expression and function when it is exogenously expressed in mammalian cells. Three independent variables were optimized in the Pure Yield Plasmid Miniprep System kit. The changes were the bacteria solution volume, centrifuge duration, and elution times. A significant increase in HMGB3 plasmid concentration was observed when the centrifuge time was extended from three minutes to five minutes. The efficiency also increases when eluting two times instead of once. The high efficiency of the amplification can be presented to researchers working on HMGB3 to aid their journeys to uncover newly developed inquiries of this protein. (Faculty Sponsor: Dr. Zhipeng Tao)

Supported by TWU Center for Student Research.

15. THERMAL GRAVIMETRIC ANALYSIS AND RAMAN SPECTRAL CHARACTERIZATION OF CARBON NANOTUBES. M. Rodriguez, M. Obradovic, N. Mirsaleh-Kohan. Sciences – Chemistry and Biochemistry

Carbon nanotubes (CNTs) can capture carbon dioxide, making them a potential solution for the reduction of greenhouse gases. These nanostructures are composed of sheets of graphene and can vary in diameters, number of carbon walls and in whether they contain functional groups. To better comprehend the influence of heat on the properties of carbon nanotubes (CNTs) and the stability of these CNTs, CNTs samples are analyzed using Thermal Gravimetric Analysis (TGA) where the sample is gradually heated at 20 o C per minute from room temperature up to 1000 o C. TG Analysis are used to study the thermal stability of the samples by obtaining the changes in weight of the sample as the temperature increases. Furthermore, the samples of CNTs are examined using Raman Spectroscopy to analyze CNT spectral features before and after heating, aiming to detect any structural alterations that could influence CNTs ability to capture carbon dioxide. (Faculty Sponsor: Dr. Nasrin MirsalehKohan)

16. UNDERSTANDING HCMV PUS27: EXPLORING HOW CELLULAR PROTEINS CONTROL THE INTERNALIZATION AND RECYCLING OF A VIRAL RECEPTOR. G. Connors, J. Spencer. Sciences – Biology

Human Cytomegalovirus (HCMV) is a common virus that can stay in the body for life, mainly affecting people with weakened immune systems. The US27 gene of HCMV encodes a protein similar to cell surface receptors which are important for cell signaling. The pUS27 protein does not have any known ligands but can activate genes related to stress responses. In our research, we looked at how pUS27 enters cells and is recycled, which would hint at its signaling regulation. Using a variety of assays, we found that two proteins, adaptor protein-2 (AP-2) and β-arrestin, interact with pUS27, suggesting it is taken into cells via a process called clathrin-coated endocytosis. We also found N-ethylmaleimide sensitive factor (NSF) and gamma-aminobutyric acid type A receptor-associated protein (GABARAP), which are involved in recycling, interact with pUS27. These insights are crucial for understanding pUS27 signaling and viral GPCRs in HCMV pathogenesis, potentially informing antiviral strategies. (Faculty Sponsor: Dr. Juliet Spencer)

Supported by TWU Center for Student Research.

17. ADVANCED COMPOSITE MATERIALS FOR SPACE SUITS APPLICATIONS: COMPUTATIONAL STUDY. S. Lang, S. Lin. Sciences – Chemistry and Biochemistry

Modern Space Suit materials maintain properties that shield astronauts from radiation, severe lunar temperature, and microparticles; while upholding lightweightness, flexibility and tensile strength on long space missions. High density polyethylene (HDPE) is a popular polymer for space applications due to their resistance properties from secondary radiation exposure and their richness in hydrogen atoms. HDPE lacks tensile strength, causing urgency to find a material that will maintain strength. This study investigates the additional low-dimensional materials with HDPE, using computational methods to understand their potential applications in space suits. We focused on incorporating Graphene Oxide (GO) and Molybdenum Disulfide (MoS2) with HDPE, utilizing the Vienna Ab initio Simulation Package (VASP) for comprehensive analyses of their electronic structures and properties. GO is a derivative of graphene with various functional groups, which significantly alter its chemical reactivity and electronic properties. MoS2 is another promising material due to its layered structure and tunable electronic properties. (Faculty Sponsor: Dr. Shiru Lin)

Supported by NSF Award 1953448 (PRIME) and STAR scholar.

18. ANALYSIS OF PLANT EXTRACTS FOR TOXICITY TO NORMAL AND CANCER CELL LINES. M. Zuniga, L. Hanson. Sciences – Biology

Various plant extracts have been studied for their potential antimicrobial and therapeutic properties. We investigated toxicity effects of Croton texensis, Maclura pomifera, Physostegia virginiana, and Lantana urticoides on J774 macrophage cells and B35 neuroblastoma cells using both microscopic observation and the CellTiter-Glo assay, which measures ATP production. Our initial findings indicate that most of the plant extracts exhibit low to moderate toxicity to macrophages, with the exception of the Physostegia, which was highly inhibitory. Preliminary analysis of the B35 neuroblastoma cancer cell line showed evidence of toxicity to these cells by a wider array of plant extracts. This suggests that some of these plant extracts could have potential for anti-cancer activity, but more research is needed to see if that is a possibility. (Faculty Sponsor: Dr. Laura Hanson)

Supported by TWU Experiential Student Scholars Program and NSF Award 1953448 (PRIME).

19. BLACK SUPERHEROES. T. Jemison, G. Smith. Social Work, Psychology, and Philosophy

The superhero genre has become a dominant force in film and television, yet racial and gender representation remains a persistent issue, particularly concerning Black female superheroes. This study conducts a content analysis of Storm's portrayal in live-action and animated adaptations to examine how her character is framed in relation to race, gender, and media stereotypes. Using a systematic coding framework, we analyze Storm's narrative agency, dialogue, visual representation, role significance, and character development across multiple screen adaptations, including X-Men (2000–2019), X-Men: The Animated Series (1992–1997), and X-Men: Evolution (2000–2003). We categorize recurring themes such as leadership, power dynamics, racialized tropes, and the extent of her narrative influence within the

ensemble cast. Additionally, we incorporate insights from peer- reviewed literature and media analyses to contextualize her on-screen portrayal within broader patterns of representation in Hollywood. Through this research, we aim to assess how Storm's cinematic and televised depictions contribute to—or limit—the visibility and complexity of Black female superheroes in mainstream media. (Faculty Sponsor: Dr. Gabrielle Smith)

20. DORSAL HORN ARBORIZATION: A POSSIBLE CONNECTION BETWEEN SICKLE CELL DISEASE AND HYPERALGESIA. C. Broomfield, K. Sadler, D. Hynds. Sciences – Biology

Sickle cell disease (SCD) causes intense pain, but the underlying neurobiology is not well understood. Transgenic SCD mice show increased inflammation and heightened pain sensitivity. Previous research suggests that transient receptor potential vanilloid type 4 (TRPV4) cation channel plays a role in peripheral hypersensitivity. Additionally, peripheral fibers in Berkeley SCD mice display widespread neuropathy due to myelin instability. Other studies have found that elevated lysophosphatidylcholine (LPC) directly modulates transient receptor potential canonical 5 (TRPC5), contributing to persistent pain following inflammatory and neuropathic injuries in mice. Using immunohistochemistry, this study will compare lumbar spinal nerve tracts from UT Dallas transgenic SCD mice and control animals to examine neuron arborization in afferent neurons. We expect to observe increased arborization in the dorsal horn Rexed laminae layers I, II, and V. This increased arborization would expand the activation of neurons in the spinal cord, amplifying pain signals and enhancing pain perception. (Faculty Sponsor: Dr. Dianna Hynds)

21. EXAMINING THE HEAVY METAL CONTENT IN HERBAL SUPPLEMENTS VIA ELEMENTAL ANALYSIS. S. Harms, A. Penny, S. Bernstein, A. Rodriguez Navarro, V. Lalugba. Sciences – Chemistry and Biochemistry

Herbal supplements are increasingly marketed to university students. However, these supplements are poorly regulated, and their safety is not assured: some contain harmful heavy metals such as mercury, cadmium, and lead, which may pose serious health risks to consumers. The aim of our study is to identify and measure the prevalence of these heavy metals in herbal supplements by conducting a literature review and testing herbal supplements (provided by TWU students) for the presence of mercury, cadmium, lead, and other heavy metals using various elemental analysis techniques. We hypothesize contaminants are found across different supplement products, raising essential questions about the need to regulate these manufacturers. Our research and the current body of literature contributes to the growing body of evidence urging stronger regulatory measures to improve the safety of these widely used products. (Faculty Sponsor: Dr. Mary Anderson)

Supported by Welsh Foundation Grant.

22. EXPLORING MTORC2 DYSREGULATION IN RAB GTPASE-MEDIATED NEUREXIN-1 TRANSPORT: IMPLICATIONS FOR SYNAPTIC DYSFUNCTION. M. Hutton, E. Swensen, D. Hynds. Sciences – Biology

Autism spectrum disorder (ASD) neuropathology results in disruptions of neuronal communication, including the regulation of critical presynaptic proteins like Neurexin-1 (NRX1), which are essential for synapse formation and function. Our lab previously found Rab GTPases (Rab3A, Rab27A, and Rab37) are important in regulating NRX1 vesicular transport in neurons. Additionally, the mammalian target of rapamycin complex 2 (mTORC2) regulates cytoskeletal dynamics and its dysfunction is also implicated in ASD. However, its precise role in NRX1 transport remains unclear. Since NRX1 dysfunction is strongly associated with ASD, we hypothesize that mTORC2 disruption further impairs Rab-dependent NRX1 transport, leading to synaptic mislocalization and impaired connectivity observed in ASD. To test this, we will induce mTORC2 dysfunction in B35 neuroblastoma cells and rat cortical neurons using pharmacological inhibition and genetic knockdown. NRX1 localization will be analyzed via live-cell imaging, immunocytochemistry, and Rab GTPase activity assays. These findings will provide insight into ASD-related synaptic dysfunction. (Faculty Sponsor: Dr. Dianna Hynds)

Supported by the TWU Quality Enhancement Plan and TWU Jane Nelson Institute for Women's Leadership.

23. FROM THE PUBLIC EYE: THE PUBLIC HISTORY OF THE SCOPES "MONKEY" TRIAL. A. Martin. Social Sciences and Historical Studies

The Scopes "Monkey" Trial is one of the most prominent cases in American history, and is credited to be the catalyst for the ongoing culture war between fundamentalism and modernism. The trial calls into question the constitutionality of the "Butler Act" - a Tennessee law that made it unlawful to teach that man was "descended from a lower order of animals" (evolution) at any public university or school. Orchestrated by the ACLU, the defense sought not to prove Scopes innocent but instead challenge the constitutionality of the act in hopes of having it repealed. My research aims to identify how the Scopes Trial has been communicated to the public - through mediums such as film, newspapers, podcasts, books, etcetera - and identify how these representations have misrepresented the purpose of the trial, fueling conflict and misconceptions surrounding what the trial was about, Darwinist theory, and what happened during and after the trial. (Faculty Sponsor: Dr. Katherine Landdeck)

24. HFCS CLIMATE EFFECTS AND WHAT WE CAN DO. M. Lambert, M. Hoots, A. Martinez, A. Krenek-Sandoval, H. Kouadio. Sciences – Environmental Science

The focus of climate change is often carbon dioxide emissions

produced through cars and companies running factories that give off environmentally harmful pollutants, but housing air conditioning and fridges contribute much more than people think. If we want to make progress in climate change collectively, we need to consider all anthropogenic factors and the limitations of our planet. In refrigeration, Hydrofluorocarbons (HFCs) were once seen as the solution to the harmful chemical known as chlorofluorocarbons (CFCs) (which negatively impacted the ozone layer). As our knowledge about these chemicals improves with time, it becomes clear that HFCs are not the solution the world once thought they were. Despite this, HFCs are still heavily relied upon by the world at large. This research aims to shift focus toward finding replacements for HFCs that are feasible. While limits on the use of HFCs have already been enacted, more efforts must be conducted to completely phase them out. Our goal is to identify the long term consequences of continued HFCs use and find potential solutions. (Faculty Sponsor: Dr. Halima Kouadio)

25. IMPACT OF HUMAN CYTIMEGALOVIRUS ON CELLULAR LIPID COMPOSITION. C. Mendez, J. Spencer, L. Faure, A. Martins. Sciences – Biology

Human Cytomegalovirus (HCMV) infects a majority of the human population, generally causing no symptoms except in immunodeficient individuals. HCMV is a large double-stranded DNA virus with an icosahedral capsid enclosed in a lipid envelope that is derived from the host cell. We hypothesized that HCMV infection may impact cellular lipid composition. To examine baseline levels of lipid content and lipid composition, we performed thin layer chromatography (TLC) and gas chromatography-mass spectrometry (GC-MS) on neonatal fibroblasts (NuFF) and retinal epithelial cells (ARPE-19). We found that the two cell types had similar lipid compositions. Next we will determine the total lipid levels and lipid composition of HCMV infected ARPE-19 and NuFF cells to determine the impact of virus infection. A better understanding of how HCMV affects the cellular lipid composition will clarify how HCMV modifies host cell physiology, which may help develop new antiviral treatments to fight against HCMV infection. (Faculty Sponsor: Dr. Juliet Spencer)

Supported by NSF Award 1953448 (PRIME) and TWU Center for Student Research.

26. INVESTIGATING THE POTENTIAL ROLE OF HISTONE DEACETYLASES FROM CLASS I, II, AND III IN THE CHROMATIN COMPACTION OF PRIMARY HUMAN EPIDERMAL MELANOCYTES AFTER UV EXPOSURE. J. Khanum, R. Roy, M. Abbas, M. Subramanian, M. Bergel. Sciences – Biology

UV radiation triggers chromatin compaction that protects DNA from damage through a short-term calcium influx. This study explores the role of sirtuins, Class III HDACs, and class I and II HDACs, in the long-term chromatin compaction following UV radiation. For this experiment HeLa cells and Primary Human Epidermal Melanocytes (HEMs) were treated with sirtinol (sirtuin inhibitor) at different time points and concentrations. Cell viability of HeLa cells and HEMs was assessed using MTS assay, and the optimal sirtinol concentration and incubation time for higher core histone acetylation were determined by Western blotting. As sirtuin-associated acetylation pattern in melanocytes resulted promising, HEMs will be treated with sirtinol, trichostatin A (HDAC classes I and II inhibitor), and a combination of the two inhibitors and then UV-B irradiated. UV-induced chromatin compaction at different time points after radiation will be examined by confocal microscopy and Cytation imaging when the HDACs activity is inhibited. (Faculty Sponsor: Dr. Michael Bergel)

27. MEETING PSYCHOLOGICAL NEEDS IN FOSTER CARE: A CHOICE THEORY PERSPECTIVE. D. Shirinian, I. Luna, S. Iqbal. Human Sciences

Choice Theory asserts that individuals are driven by psychological needs such as belonging, power, freedom, and fun. When unmet, these needs can lead to external control and unhealthy relationships, causing dissatisfaction and conflict. In foster care, caregivers' self-efficacy, or belief in their ability to manage behaviors and foster change, is crucial, shaping responses to challenges and emotional development. Current research highlights the effectiveness of Choice Theory in therapeutic foster care, where strong relationships help children develop decision- making skills. Additionally, parent training based on Choice Theory has improved caregiver confidence and reduced family conflicts, suggesting that fulfilling psychological needs, fostering motivation, and promoting responsibility enhance caregiving. Emphasizing solution-oriented approaches, these strategies underscore the importance of caregiver confidence and structured support in fostering positive change for children facing trauma. These principles offer insights into strengthening relationships and navigating the challenges of raising children with complex backgrounds. (Faculty Sponsor: Dr. Diana Rodriguez)

28. POLLEN MORPHOLOGY INFLUENCES BEE FORAGING BEHAVIOR AND POLLEN COLLECTION EFFICIENCY. F. Jimenez, C. Maier. Sciences – Biology

Pollen morphology, including shape, size, and surface texture, affects plant-pollinator interactions. Earlier studies have shown inconsistencies in understanding how pollen morphology influences the foraging behavior of honey bees. We hypothesize that morphological features of pollen grains can contribute to bee foraging behavior and how efficiently they collect pollen. By examining detailed morphological traits of pollen grains in the TWU butterfly gardens using a scanning electron microscope, we aim to clarify how pollen traits impact pollen collection and foraging behavior. We will compare the pollen from the native plants in our gardens with that of commercially available pollen of European origin. European pollen pellets collected from bees will be sonicated

in solvents such as chloroform, ethanol, and hot water before being visualized microscopically. Our findings could provide a deeper insight into the plant-pollinator interactions, contributing conservation of plant diversity and pollinators. (Faculty Sponsor: Dr. Camelia Maier)

29. SALT EFFECTS ON GEMINI SURFACTANT-DNA QUADRUPLEX INTERACTIONS. M. Hastings, H. Kennedy, R. Sheardy. Sciences – Chemistry and Biochemistry

DNA secondary structures are stabilized by mono and divalent cations such as simple ammonium and diammonium compounds. Our lab has investigated the interaction between a DNA quadruplex formed from (TTAGGG)4 and a diammonium Gemini surfactant. Samples of DNA and surfactant of varying ratios were prepared, and a precipitate was formed in all samples. After centrifugation of these samples, the supernatant was probed for DNA by spectroscopic techniques (UV/Vis and CD). Thus, the extent of precipitation of the DNA depends on DNA and surfactant concentrations and DNA charge density. Both electrostatic and hydrophobic forces govern the interaction between the DNA and the surfactant. To address the electrostatic interactions, samples of DNA and surfactant were prepared with various concentrations of K+. The results indicate that high concentrations of K+ inhibit the formation of the DNA surfactant precipitate. These results will be discussed in terms of novel gene delivery systems. (Faculty Sponsor: Dr. Nasrin MirsalehKohan)

Supported by NSF Award 1953448 (PRIME) and Robert A. Welch Foundation.

30. THE RELATIONSHIP BETWEEN HUMOR STYLES AND DIFFERENT POPULATIONS. R. Morrison. Social Work, Psychology, and Philosophy

This project is part of ongoing research investigating how different humor styles are utilized across various populations (age, race, sex, sexual orientation, etc.). Participants are being recruited through SONA systems and social media platforms. They are asked to complete a survey that examines how humor is incorporated into daily life and social interactions, along with questions regarding demographic information and mental health diagnoses. The primary aim of this study is to explore the variations in humor use across diverse populations and to analyze how positive and negative humor styles may relate to well-being and coping mechanisms. (Faculty Sponsor: Dr. Alannah Shelby Rivers)

31. TO GROW OR NOT TO GROW: DOES GROWTH MEDIA AFFECT NATIVE PLANT INHIBITION OF BACTERIA? P. Dwamena, L. Hanson. Sciences – Biology

Although often traditionally used, the true antimicrobial effects of plants are not always certain. With the growing incidence of antibiotic resistance, it is imperative that new ways to treat things such as sexually transmitted infections (STIs) are found. This research aims to assess whether certain native plants historically used as therapies have antimicrobial properties against representative bacteria, Gram-negative (Escherichia coli) and Gram-positive (Bacillus megaterium). Since herbal medicines are often teas, parts of selected plants were made into aqueous extracts and prepared in ultra-pure water at a 4:1 ratio of water to grams plant material. With discrepancies in previous literature for unknown reasons, we tested the effect of media composition on the inhibition or enhancement of certain plants on bacteria. Tryptic Soy Broth media was compared to Luria-Bertani (LB) media to also aid in the expansion to new bacteria. If there are differences, which components are responsible will be addressed. (Faculty Sponsor: Dr. Laura Hanson)

32. UNDERSTANDING PAX6 ROSETTE FORMATION IN EMBRYOID BODIES. B. Morgan, N. Smith, Z. Lybrand. Sciences – Biology

To better understand the human brain, scientists have developed brain organoids, which are lab-grown tissue cultures derived from stem cells to model cortical development. One key protein that plays a crucial role in neural development is PAX6. PAX6 is a transcription factor that regulates the expression of genes involved in neural development, particularly in the formation of the forebrain and eyes. Brain organoids provide valuable insights into the brain's structure, but they still fall short in capturing the full complexity of a human brain. This project focuses on PAX6 rosette formation in aggregate embryoid bodies, which are three-dimensional clusters of stem cells simulating early development. By utilizing immunohistochemistry, microscopy, imaging, and data analysis, we were able examine spatial distribution of PAX6 in single and multiple brain organoids to compare PAX6 distribution. This project is still ongoing, and will contribute significantly to bettering our understanding of neural development and neurological diseases. (Faculty Sponsor: Dr. Zane Lybrand)

Session 3. Tuesday, April 22, 6:00 pm – 7:20 pm Student Union 2300 (Southwest Ballroom)

1. "LAZY" SUBJECTS, LAPSED STATES: NATIVISM AND THE RACIALIZED POLITICS OF U.S. POLICY TOWARDS PUERTO RICANS. R. Briscoe. Social Sciences and Historical Studies

Since the U.S. acquired Puerto Rico in 1898, a strategy of "noncolonial imperialism" initially received Puerto Rican support but later led to growing dissatisfaction as U.S. capitalism entrenched political and economic subordination. The evolving relationship has sparked debates on Puerto Rico's future, highlighting how U.S. policies foster dependency and second-class citizenship. Using Puerto Rican identities and movements, this research examines U.S. policies through the lens of American nativism, revealing how these policies mirror broader patterns of exclusion. Key legal milestones, such as the Insular Cases and the Jones Act of 1917, which granted Puerto Rican citizenship while stripping autonomy, are connected to concurrent nativist legislation,

like the Immigration Act of 1917. By exploring Puerto Rican subordination alongside U.S. immigration laws targeting other marginalized groups, this study underscores the role of American nativism in shaping the U.S.-Puerto Rico relationship and the continued marginalization of Puerto Ricans. (Faculty Sponsor: Dr. Katherine Landdeck)

2. CHLORHEXIDINE INTERACTION WITH MICROCRYSTALLINE CELLULOSE. U. Joshi, J. Beatty. Sciences – Chemistry and Biochemistry

Chlorhexidine, widely used as a disinfectant and antiseptic in medical and dental applications, reacts with sodium hypochlorite, a common cleanser and bleach, forming potentially toxic byproducts. This reaction is particularly concerning in both medical settings and everyday laundering, where chlorhexidine-treated fabrics washed with bleach develop permanent stains due to chemical interactions with cellulose fibers. Previous research has identified compounds such as para-chloroaniline, which contribute to both toxicity and fiber degradation. This study aims to further analyze the breakdown products of chlorhexidine and sodium hypochlorite using gas chromatography-mass spectrometry (GC-MS) and high- performance liquid chromatography (HPLC). By examining microcrystalline cellulose as a model, we will investigate the mechanisms of staining and toxicity. Identifying these reaction products will improve our understanding of chlorhexidine's interactions with bleach and textiles, guiding safer use in healthcare and environmental settings. (Faculty Sponsor: Dr. John Beatty)

Supported by Robert A. Welch Foundation, TWU Center for Student Research, NSF Award 1953448 (PRIME).

3. WITHDRAWN

4. DISCOVERING DISPARITIES IN TREATMENT TO PREPARE AND SUPPORT MENTAL HEALTH PRACTITIONERS IN TREATING PEDOPHILIA. E. Loffler, O. Day, M. Victor, B. Ayala, V. Drice, M. Murphy. Social Work, Psychology, and Philosophy

With 23.1% of respondents in prior studies reporting sexual interest in children, and up to 5% of the population experiencing persistent attraction to prepubescent children, proactive child protection is critical (Abramowitz & Sorrentino, 2021; Levenson et al., 2019; Ó Ciardha et al., 2021). 95% of psychotherapists are unwilling to treat minor-attracted- persons (MAPs) despite their mental health implications (2016 Abramowitz & Sorrentino, 2021; Hall & Hall, 2017; Roche & Stephens, 2022). This study aimed to uncover therapists' level-of-willingness to treat MAPs while concurrently evaluating potential anti-reluctance strategies. A student and licensed psychological professional sample completed an online survey of the Adverse Childhood Experiences Survey (Mei, et al., 2022), and a series of demographics, Likert and open-ended questions. An exploratory theme analysis revealed high stigma, generalization, and reluctance influencing willingness to treat, but also a desire for more education. Interaction between trauma exposure and group membership are examined. Implications and future directions are discussed. (Faculty Sponsor: Dr. Otter Day)

Supported by TWU Experiential Student Scholars Program.

5. HEARING LOSS IN DENTISTRY: AN UNHEARD TOPIC. C. Booth, E. Carmichael, E. Mora, V. Doan, Y. Hena Orozco. Communication Sciences and Oral Health

Research suggests an association between long-term exposure to harmful noise in the workplace and hearing loss. Prolonged exposure to high- frequency noises over time can damage structures within the inner ear, leading to gradual hearing loss. In a study, dental ultrasonic scalers were found to have an average sound output of 107 decibels (dB). This is higher than the occupational noise exposure limit of 85 dB over an 8-hour workday, which can increase the risk of permanent hearing damage. The lack of awareness and prevention of noise-induced hearing loss (NHIL) among dental professionals should be emphasized and addressed more frequently. Implementing education and prevention strategies can reduce the risk of NIHL. Encouraging auditory wellness will ultimately promote a better quality of life and prolong the career of dental professionals. Recognizing NIHL risks is essential among dental personnel, and proactive prevention measures should be enhanced for long-term hearing health. Keywords: High- frequency exposure, risk, hearing loss, dental professionals, auditory wellness, awareness, prevention. (Faculty Sponsor: Dr. Charlene Dickinson)

6. INNOVATIVE SKINCARE: A TEEN'S BREAKTHROUGH IN SKIN CANCER TREATMENT. G. Hamlin, S. Joseph, K. Jones, R. Swartz. Sciences – Chemistry and Biochemistry

Skin cancer is the most common type of cancer with basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma being the three main types. While treatments range from topical therapies to surgery, an innovative approach has emerged: a soap infused with imiquimod, a drug that stimulates the immune system to target and eliminate cancerous cells. Developed by Heman Bekele, this soap utilizes lipid-based nanoparticles to enhance drug delivery through the skin, making treatment more accessible and cost effective. Unlike traditional creams, the soap makes application easier and more consistent, which could help more people stick to their treatment. By making this part of a daily routine, the soap could offer a simpler and more accessible way to treat early stage skin cancer, especially BCC and SCC. While more research is needed this innovation is a major step toward affordable, non-invasive treatment options. (Faculty Sponsor: Dr. Mary Anderson)

7. MICROGRAVITY EXPERIMENT FOR LUNAR DUST (MELD): A PLATFORM TO STUDY LUNAR DUST INTERACTIONS WITH SURFACES. S. Daigle, K. Coker, J. Kelber, E. Bidot, M. Wittal, R.

Zhang. Sciences – Chemistry and Biochemistry

Lunar regolith consists of fine dust to boulder-sized particles, primarily composed of oxygen (O), silicon (Si), iron (Fe), and titanium (Ti). Lacking weathering, its sharp-edged dust clings to surfaces due to static charge, causing damage during landings. To counter this, protective coatings are being developed. In collaboration with UNT and NASA, this project focuses on coatings that repel lunar dust, aid heat dissipation, and protect equipment. We built a vacuum chamber with a dust eductor to simulate lunar conditions and test dust impacts on various surfaces. Using bare silicon wafers and other materials, we analyzed surfaces before and after dust exposure with Scanning Electron Microscopy (SEM) and FTIR microscopy. These assessments help evaluate surface changes and the effectiveness of protective coatings. (Faculty Sponsor: Dr. John Beatty)

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8. MOTION DETECTION USING CARBON NANOTUBES. S. Haque, A. Ashrafian, J. Beatty. Sciences – Chemistry and Biochemistry

Wearable technology has the potential to enhance health monitoring, particularly for individuals with movement-related conditions. Nanotechnology sensors have been shown to aid in the early detection of mobility-related and joint issues. This project aims to develop a flexible, conductive sensor using carbon nanotubes embedded in silicone, latex, or polydimethylsiloxane (PDMS) to assess mechanical movement through the angle of flexion. Compared to other nanomaterials like silver nanowires, carbon nanotubes can serve as an alternative but present challenges when similar assembly methods are used. Several prototypes were created using various methods before successfully developing a working prototype with compatible materials. The completed motion sensor can detect minute movements through a thin layer when connected to a multimeter. This research contributes to the advancement of wearable movement sensors for medical and rehabilitation applications. (Faculty Sponsor: Dr. John Beatty)

Supported by TWU Experiential Student Scholars Program.

9. PAINTED FACES: THE ROLE OF MAKEUP IN SHAPING 1930S IDENTITY IN AN ERA OF HARDSHIP. E. Price. Social Sciences and Historical Studies

The 1930s was marked by a time of intense economic and social upheaval. The effects of the Great Depression plagued the nation, yet the makeup industry was able not only to survive, but thrive. The reasons beauty companies survived are connected to the ways in which society was changing and growing, namely escapism and growing technologies. Beauty and socioeconomic norms have an interconnected relationship: by studying the two in conjunction, we understand the larger context of a cultural landscape. Makeup in the 1930s represented the cultural zeitgeist of an era of hardships, serving as a form of escapism and a reflection of societal values such as desire for stability, glamour, and moral femininity. This study seeks to uncover the reasons in which the beauty industry thrived through the height of the depression, but also to understand the relationship between beauty and social identity of the 1930s in the United States. (Faculty Sponsor: Dr. Katherine Landdeck)

10. RECYCLING PLASTIC WASTE. R. Sport, G. Salazar, J. Leija. Sciences – Chemistry and Biochemistry

Circular economy aims to repurpose waste by promoting the continuous reuse and recycling of materials. One example where circular economy can be applied is the production and management of polycarbonate (PC), a versatile plastic used to make everyday items. Commonplace methods of recycling PC often lead to the degradation of the material or consume large amounts of energy, limiting their sustainability. This research explores the potential of alcoholysis as a sustainable alternative to recycling PC. By using ethanol, the alcoholysis breaks down the polymer into its constituent monomers. Providing a method of high-yield, high-sustainability, and high- purity recovered starting materials, alcoholysis offers a way to close the gap in PC's circular economy. Investigating the key factors and their impact on the efficiency and scalability of alcoholysis, contributing valuable insights toward developing economically feasible and environmentally friendly recycling solutions. (Faculty Sponsor: Dr. Gustavo Salazar)

Supported by National Science Foundation.

11. SCREENING DLG4 INDUCED PLURIPOTENT STEM CELL LINES FOR PLURIPOTENCY. A. Carvish, A. Randall, P. Karmacharya, Z. Lybrand. Sciences – Biology

Mutations in the DLG4 gene are associated with a variety of neurological conditions, including epilepsy, schizophrenia and autism spectrum disorder (ASD). DLG4 encodes for PSD-95, a scaffolding protein essential for synaptic maturation, dendritic morphology, and neurotransmission for excitatory neurons (Tokunaga et al., 2024). A critical gap in knowledge exists about the specific effects of DLG4 variants in humans and related synaptopathy. This project aims to investigate the therapeutic potential of correcting PSD-95 deficiencies through an in vitro model where patient derived induced pluripotent stem cells (iPSCs) are differentiated into 2D glutamatergic neurons. The methodology involves proliferating DLG4 variant and sibling control human cell lines, validating iPSCs pluripotency through Sox2 immunostaining and assessing the clinical benefit of correcting PSD- 95 deficiencies. This poster outlines our preparation for a neuronal model. This includes literature comprehension, protocols for HEK293 and iPSC culturing, immunostaining,

fluorescence imaging and preparations for sequencing. (Faculty Sponsor: Dr. Zane Lybrand)

Supported by TWU REP, DLG4 Shine Foundation.

12. THE EXPLORATION OF ART EDUCATION IN CHARACTER DEVELOPMENT AND SELF- ACTUALIZATION: A FOCUS ON GRATITUDE. T. Scott-Anchietta. Arts and Design – Visual Arts

This study explores how art education can help primary students self- actualize their identity, values, and social-emotional strengths. By fostering stable values and self-awareness, students can better advocate for themselves and others. Research by The National Endowment for the Arts and The American Academy of Arts and Sciences highlights that art education encourages prosocial behavior and self-expression. The study focuses on middle school students' perceptions of gratitude through art, examining how it relates to their identity and critical thinking skills. Ten students will participate in semi-structured interviews before and after an art lesson centered on gratitude, with their artwork and interview responses analyzed using thematic analysis. The aim is to understand how art education can integrate social-emotional learning and self-discovery, fostering positive community-building and character development. Ultimately, the research seeks to demonstrate how art education can contribute to cultivating stable, kind, and reflective individuals within communities. (Faculty Sponsor: Dr. Sara Ishii)

Supported by McNair Scholars.

13. THE SKILL-BODY CONNECTION: HOW THERAPIST SKILLS IMPACT PHYSIOLOGY DURING FSIS TASK. M. Schock, R. Shyu, H. Vo, I. Speights, D. Shirinian, A. Jones. Human Sciences

This study examines the connection between therapists' physiological responses and their therapeutic skills. Using 21 graduate-level Marriage and Family Therapy students, participants responded to challenging multicultural vignettes in their own therapeutic style. Their responses were transcribed, de-identified, and rated using the Facilitative Systemic Intervention Skills (FSIS) measure by nine trained raters. Physiological responses were recorded before, during, and after responding. We explore whether stronger therapeutic skills correlate with lower baseline-corrected physiological responses. Findings offer insights into the FSIS measure's potential for assessing therapist performance and its implications for training. (Faculty Sponsor: Dr. Adam Jones)

14. WHAT IS THE EXPERIENCE OF YOUTH IN FOSTER CARE AS THEY TRANSITION OUT OF FOSTER CARE? N. Foley. Human Sciences

The purpose of this research project is to investigate the transition experiences of young people who "age out" of the foster care system upon reaching the maximum legal age. Through a survey-based approach, we will explore whether these individuals receive adequate support during their transition to independent adulthood, to identify gaps in services that may impact on the quality of life for these young adults. By examining their personal experiences of the transition process, we hope to raise awareness for improving support services and enhancing outcomes for future individuals transitioning out of foster care. The findings of this study will contribute to a deeper understanding of the challenges faced by this population, to improve their overall well-being. (Faculty Sponsor: Dr. Rebecca LuceroJones)

Supported by Pioneering Discovery Mentorship Research Project.

15. THE OVERLAP OF DEMENTIA AND PTSD, THE EFFECT OF CHRONIC STRESS, AND PROPOSED TREATMENTS. H. Liu, G. Medina. Social Work, Psychology, and Philosophy

PTSD structurally alters the brain, shown by the shrinkage of the amygdala, hippocampus, and the cerebellum in sample sizes of patients. This is a result from overactivity in these areas, including the prefrontal cortex, and the chronic exposure to cortisol, including but not limited to: memory loss, difficulty forming new memories, impaired emotional regulation, problems with spatial navigation, balance issues, motor coordination difficulties, mood swings, anxiety, and increased susceptibility to stress. While the most common treatments of PTSD are psychotherapy and medication, if we go to the root of the issue of brain shrinkage, and we treat those biological areas while incorporating a holistic approach such as seen in dementia patients, then we may see increased rates of recovery and overall better rehabilitation. The reversal of brain shrinkage in these vital parts may contribute to successful recovery. (Faculty Sponsor: Dr. Dowon Choi)

16. TEXAS COLLEGE READINESS STANDARDS: UNDERSTANDING AND ACHIEVING THE CCMR METRIC FOR COLLEGE-READINESS AND STUDENT SUCCESS. J. Hurlbut. Teacher Education

For my PASL project, it was vital to identify the programs at Mckinney North HS that were not preparing students for post-graduation success according to State of Texas standards. While eHigh and Credit Recovery at MNHS work together as a program to focus on credit recovery and student dropout prevention, it was not enough to meet the State requirement for college-readiness. Therefore, it was a priority to introduce a way to have students earn the CCMR point credit while in eHigh or Credit Recovery to ensure meeting college-readiness standards by the State of Texas. While the dropout rate was low, the number of students who had earned a CCMR component as a non-traditional graduate became a priority due to the low student achievement in this area. As a result, a CCMR success measure was instituted for all students who were not being served adequately in this manner. (Faculty Sponsor: Dr. Laura TrujilloJenks)

17. RELATIONSHIP BETWEEN MICROAGGRESSIONS EXPERIENCED BY REGISTERED DIETITIANS (RDNS) IN THE

WORKPLACE AND ANXIETY. T. Leakey, K. Davis, W. Wang. Nutrition and Food Sciences - Denton

Microaggressions are common in health care and can occur in many settings. The study examined exposure to microaggressions among registered dietitian nutritionists (RDNs) in the workplace and evaluated whether microaggressions are associated with anxiety. The study also explored demographic characteristics related to experiencing microaggressions in the workplace. The study is a cross-sectional online survey which included demographic questions, Racial and Ethnic Microaggressions Scale (REMS), and Beck Anxiety Inventory (BAI). Five thousand RDNs across the United States (US) from the Registry List of the Academy of Nutrition and Dietetics (AND) were emailed the survey. Higher scores of overall microaggression were significantly related to higher anxiety ($p < 0.001$). For the subscales of microaggression, higher scores of microinvalidations were significantly related to higher anxiety ($p = 0.006$), but better "support" was significantly related to lower anxiety ($p = 0.004$). No relationships between age and microaggressions were found. (Faculty Sponsor: Dr. Kathleen Davis)

Supported by TWU Jane Nelson Institute for Women's Leadership and TWU Quality Enhancement Plan.

18. PAWSITIVE PATIENTS: ANIMAL- ASSISTED THERAPY IN THE DENTAL OFFICE. K. Goolsby, A. Fultz, A. Howell, M. Creek, S. Vaughan. Communication Sciences and Oral Health

Dental anxiety is common and can discourage patients from seeking necessary care. Animal-assisted therapy (AAT) is an innovative stress-reduction protocol that helps reduce anxiety, improve behavior, and increase patient satisfaction and retention. AAT has physical benefits, including lowering heart rate, blood pressure, and cortisol levels, which can reduce the risk of medical emergencies in the dental office. Proper training, handler control, and grooming minimize infection risks and ensure pet safety. (Faculty Sponsor: Dr. Deborah Testerman)

19. NAVIGATING MULTICULTURAL IDENTITIES: ATTACHMENT, BICULTURAL IDENTITY INTEGRATION, AND WELL-BEING. C. Hernandez de la Cruz, M. Vidican, Z. Dipert, M. Kim. Social Work, Psychology, and Philosophy

Attachment theory and bicultural identity integration (BII) explain how bicultural individuals manage dual cultural identities. Unlike monocultural identity, BII involves reconciling conflicting values, norms, and beliefs from both cultures. Anxious attachment heightens sensitivity to rejection, causing reactions to perceived rejection from either cultural group. Avoidant attachment leads to distancing from cultural engagement, hindering identity integration. Secure attachment fosters resilience, enabling more effective cultural harmony. Our study examines how attachment influences BII and wellbeing. We hypothesize that anxious and avoidant attachments negatively impact BII, increasing stress and reducing life satisfaction. Bicultural and multicultural participants in the U.S. will complete four measures: the Experiences in Close Relationships Scale-Short Form, the Bicultural Identity Integration Scale-2, Perceived Stress Scale-4, and the Satisfaction with Life Scale. Regression and mediation analyses will test how BII mediates the relationship between attachment and wellbeing outcomes. Expected results will suggest that secure attachment enhances BII and psychological outcomes. (Faculty Sponsor: Dr. Mijin Kim)

20. MICROWAVE SYNTHESIS AND CHARACTERIZATION OF TRIMERIC SILVER(I) PYRAZOLATES WITH ISOPROPYL SUBSTITUENTS. N. Starrett, M. Omary, T. Han. Sciences – Chemistry and Biochemistry

Silver(I) pyrazolates are an important class of coordination compounds with diverse applications in catalysis, luminescence, and materials science. However, conventional synthesis methods require extended reflux times (24–48 hours) and large quantities of toxic solvents, making them less efficient and environmentally sustainable. Microwave-assisted synthesis offers a promising alternative by enabling direct energy transfer to the reaction medium, optimizing heating, and drastically reducing reaction times. In this study, we report the first microwave synthesis of trimeric silver(I) pyrazolates featuring isopropyl-substituted pyrazole ligands. This approach enhances reaction efficiency but also minimizes solvent usage. The synthesized complexes are characterized using single-crystal X- ray diffraction, nuclear magnetic resonance spectroscopy, luminescence studies, density functional theory calculations, and thermogravimetric analysis. This work highlights the advantages of microwave synthesis in metal-ligand chemistry and provides insights into the structural, electronic, and thermal properties of silver(I) pyrazolates, expanding their potential application in functional materials. (Faculty Sponsor: Dr. Manal Omary)

21. LESS PAIN, MORE GAIN: INNOVATIVE APPROACHES TO LOCAL ANESTHESIA. S. Fongnaly, T. Castro, S. Sohail, D. Williams, A. Hays. Communication Sciences and Oral Health

Patient management is an important aspect of dentistry, primarily due to the generalized fear associated with procedures frequently performed in the dental office. Due to this fear, many individuals neglect dental care. To address this matter, the administration of local anesthesia is a critical component when performing invasive dental procedures. However, it often induces anxiety and discomfort, though these emotions can vary widely from one individual to another. This research explores various pain-reduction methods during local anesthetic administration, focusing on both conventional and innovative approaches. Traditional methods such as the use of topical anesthetics are assessed alongside new modalities including virtual reality, needle-free injection systems, photobiomodulation therapy (PBM), microneedle patches, and oscillating devices and external cooling. Recent studies suggest that these emerging techniques offer promising alternatives to conventional

methods of local anesthetic administration, which could further improve treatment outcomes, fostering greater patient satisfaction and comfort in dental care. (Faculty Sponsor: Dr. Yancey Ulbrich)

22. HIGH VOLUME EVACUATION (HVE): THE AEROSOL SAVIOR OR JUST A FANCY VACUUM. Y. Guevara, M. Lizcano, C. Mora, V. Garcia. Communication Sciences and Oral Health

Dentistry is at high risk for aerosol transmission. Recommendations suggest using high-volume evacuation (HVE) creating a stronger suction potentially reducing contamination of infectious agents. In this study, Glo Germ™ was placed on the mannequin's teeth and ultrasonic instrumentation was utilized, removing the Glo Germ™. Grid paper was placed near the mannequin's mouth and contaminants were observed using blacklight. Devices tested were Hu-Friedy® HVE Mirror Connect, Nubird® HVE dental mirror, and VivaDent Aerosol Reduction Gel used with slow-speed suction. A one-way ANOVA was conducted to examine how devices differed in contamination containment. Results indicated a significant Levene's Test, suggesting a violation of homogeneity of variance. Therefore, a Welch's F correction was applied to the omnibus test. Results indicated statistical significance in contamination among devices. This research seeks to advance infection control practices in dentistry. It highlights the importance of ongoing research and the implementation of effective aerosol containment to enhance safety. (Faculty Sponsor: Dr. Amy Teague)

23. FURTHER INVESTIGATION TO THE INTERACTIONS BETWEEN Γ87 AND Γ242 RESIDUES IN ESCHERICHIA COLI ATP SYNTHASE. M. Espinoza, Y. Li. Sciences – Chemistry and Biochemistry

ATP synthase plays a vital role in cellular bioenergetics. This enzyme uses a unique rotary mechanism to couple proton translocation and ATP catalysis. In breif, the transmembrane proton gradient energy is turned into torque to push the spin of the rotor subunits, and then this mechanical energy is eventually stored as high energy chemical bonds in ATP. Thus, the energy flow and transmission in ATP synthase is critical to support the proper biological functions. Previous study illustrated that the γC87K mutation uncouples the energy flow in Escherichia coli ATP synthase, and additional mutation γR242Q can rectify the situation. The nature does not prefer lysine at γ87 among majority of the species; however, a lysine residue is found in Streptococcus suis, and the corresponding residue at γ242 is glycine. This research aims to answer whether γR242G can rectify the energy coupling in presence of γC87K. The experiment begins with site-directed mutagenesis to prepare two new strains (γR242G and γC87K/γR242G). The resulting mutants are then compared to the reference strains (wild type, γC87K and atp-null) by measuring their growth yield, ATPase activity, proton pumping and protein assembly level. This process helps uncover more details on the energetic aspect of ATP synthase. (Faculty Sponsor: Dr. Yunxiang Li)

Supported by Robert A. Welch Foundation.

24. DIRECT INSTRUCTION AND COOPERATIVE LEARNING FOR STUDENT ENGAGEMENT. A. Rogers. Teacher Education

This paper explores the effectiveness of Direct Instruction and Cooperative Learning models in enhancing student engagement within the high school dance classroom. Direct Instruction, a structured, teacher-led approach, has been widely recognized for its ability to improve student achievement and confidence through explicit guidance and reinforcement. Cooperative Learning, in contrast, fosters peer collaboration, communication, and problem-solving skills. The study specifically examines the implementation of the Jigsaw method within a dance education setting, where students engage in expert-group research and peer-led instruction on global dance forms. Through active participation, discussion-based assessments, and reflective surveys, the research evaluates the impact of cooperative learning on student engagement and peer relationships. Findings from this study contribute to a broader understanding of how structured and collaborative instructional methods can be adapted to diverse classroom environments, particularly in performing arts education. (Faculty Sponsor: Dr. Ludovic Sourdot)

25. COURTSIDE CAVITIES: THE PRICE OF SWEET VICTORY!. J. Freehill, A. Le, N. Balthrop, E. Bullock. Communication Sciences and Oral Health

Throughout the years, sports drinks have become popular in the athletic community due to electrolyte replenishment, energy supply, great taste, and recovery support. Athletes' widespread use of sports drinks, which often contain high sugar levels and acidic pH, poses a risk to their oral health, leading to conditions like dental caries and enamel erosion. These issues arise from the demineralization of enamel due to acidic environments created by sports drinks, a concern heightened by athletes' high consumption frequency. Studies show that athletes who frequently consume sports drinks suffer higher rates of dental decay, which can also negatively impact their performance and recovery. Behavioral models, such as the Transtheoretical Model, suggest that targeted education can influence athletes' choices, promoting healthier habits. Effective preventive strategies, including professional guidance and dietary adjustments, are essential to improving athletes' oral health and overall performance. (Faculty Sponsor: Dr. Laurie Bricker)

26. ANALYZING VIDEO DATA OF MOUSE BEHAVIOR RECEIVING TBI AND CORTICAL GRAFT TRANSPLANT. E. Andrade, Z. Lybrand, M. Gladen. Sciences – Biology

Traumatic Brain Injury can affect the motor capabilities we possess and is a conditionthat can cause our brain to dysfunction leading to cognitive, emotional, and physicalimpairments, including difficulties with memory, attention, motor coordination, and sensory processing. In our

current research, we are working to determine if a stem cell graft transplant therapy can improve motor coordination. To do so, I examined video recordings of mouse behavior that had received TBI and cortical graft transplants and scored them based on mistakes made over a 28 day period to determine if the rodents improved on functional motor abilities. The tests included MNSS which assessed reflexes and motor coordination, the parallel bars test measured motor accuracy and coordination, and the water drop test evaluated its sensorimotor response. (Faculty Sponsor: Dr. Zane Lybrand)

Supported by Mission Connect, TWU REP, McNair Scholars Program.

27. BITING INTO THE TRUTH FORENSICS IN DENTISTRY. A Stewart, A. Dean, K. Higdon, D. Acosta. Communication Sciences and Oral Health

This research explores bitemark analysis in forensic dentistry, focusing on identifying suspects through dental patterns formed by the anterior teeth. Bitemark analysis often encounters challenges including skin variability, mark distortion over time, and subjective interpretations. Traditional methods such as dental impressions, intraoral scanning, and DNA analysis highlight the need for precise dental records. Advancements like 3D scanning and microbiome analysis are under investigation to improve reliability. Recent findings indicate that digital methods using 3D scanners achieved 92% accuracy, significantly surpassing the 77% accuracy of traditional alginate impressions and inconsistent dental records.1 This study integrates technologies, specifically 3D scanners and microbiome analysis, to develop a reliable framework for bite mark analysis, potentially benefiting the Texas Forensic Science Commission and improving the resolution rates of crime cases. (Faculty Sponsor: Dr. Yancey Ulbrich)

Session 4. Wednesday, April 23, 9:00 am – 10:20 am Student Union 2300 (Southwest Ballroom)

1. OPTIMIZED MICROENCAPSULATION OF RED WINE POMACE, USING COAXIAL ELECTROSPINNING. C. GHANTA, A. Thapa, E. Boafo, H. Kelley, A. Olivares, N. Moustaid-Moussa, A. Klabasi, M. Pahlavani. Nutrition and Food Sciences - Denton

Coronary Artery Disease (CAD) is a leading cause of death, accounting for 30% global mortality. Polyphenols modulate host gut microbiota however, their bioavailability is very low. Red wine pomace (RWP) a wine bio-residue, rich in anthocyanin (ACN) play a role in CAD. We isolated glycol-macro- peptides (GMP) from whey protein and showed increased polyphenol bioavailability. We hypothesized that microencapsulation of RWP with GMP coating and electrospinning will enhance ACN bioavailability in RWP, leading to beneficial changes in gut microbiota and CAD. Coaxial electrospinning was used to successfully create the core-shell nanofibers. Formulations consists gelatin (14% w/v) and GMP (2% w/v) as shell, while the 13.5 % RWP as core in acetic acid (90%v/v).The nanofibers exhibited diameters between 87.3 nm and 649 nm. We successfully encapsulated ACNs from RWP within GMP using a novel approach. Future studies will evaluate the RWP-GMP nanofibers in gastrointestinal conditions to assess their stability and release profile. (Faculty Sponsor: Dr. Mandana Pahlavani)

Supported by USDA/NIFA grant A-1343- 2024-67018-42465.

2. AIRCRAFT USE AND WEAPONIZATION IN THE TULSA RACE MASSACRE. A. Parker. Social Sciences and Historical Studies

The Tulsa Race Massacre of 1921 is a significant event in U.S. history. It marks a particularly violent tragedy that resulted in the displacement of an established Black community, along with many of their deaths. With the armed white mob, newly deputized white civilians, and the National Guard, airplanes were also used against the Black population within the Greenwood District at Tulsa during the massacre. This poster looks specifically into the use and weaponization of aircraft, poor record-keeping, and intentional censorship that left few primary resources available for research. The Tulsa Race Riot Report by the Oklahoma Commission and Events of the Tulsa Disaster by Mary E. Jones Parrish were used to research the use of planes in the massacre. Ultimately, the identity of the pilots and their ownership is unknown to this day; however, it is certain that planes were used during the massacre. (Faculty Sponsor: Dr. Katherine Landdeck)

3. CARDIORESPIRATORY RESPONSES DURING AQUATIC TREADMILL EXERCISE. A. Kashikar, K. Biggerstaff. Kinesiology

Cardiorespiratory responses during aquatic treadmill exercise have not been documented in scientific literature. The cardiorespiratory responses during traditional treadmill, aquatic treadmill, and body weight supported treadmill exercise will be measured in healthy, young adults. Heart rate (HR) and systolic and diastolic blood pressure (SBP/DBP), oxygen consumption (VO2) and rating of perceived exertion (RPE) will be measured at rest and during treadmill exercise at 3.0 mph for 3 minutes. Each treadmill test will then increase to 5.0 mph and the same measurements will be performed after 3 minutes. A two minute cool-down will be performed at 1.5 mph. A 3x2 analysis of variance and a post hoc test will be used to determine significant differences. The criterion level of statistical significance will be set at $p<.05$. (Faculty Sponsor: Dr. Kyle Biggerstaff)

4. DAWN AND THE SEA: A VISUAL AUTOBIOGRAPHICAL ALLEGORY FOR THE GALLERY AND FOR THE READER. S. Rainey. Arts and Design – Visual Arts

At the center of my creative practice as a visual artist, is the interest in the intersection of our everyday lives and the wonderful. My work seeks to examine the pockets of joy, beauty, and the sacred in the midst of mundanity. Part of my interest in this topic stems from my study of Redemptive Theology, a branch of biblical doctrine that outlines God's fervent desire and complete ability to bring to perfect

wholeness and absolute beauty the broken and disorderedness of the world. Through my recent project Dawn and the Sea, I seek to re-create my own life's journey through this redemptive lens. By engaging with my own story through allegorical, fantastical collage illustrations in an artist book, I hope to bring to light the light that can be present in mundane and even adverse experiences of everyday life in a way that is relatable to others. I also hope to challenge traditional modes of fine art exhibition by creating a series of works that can be displayed in institutional gallery spaces, as well as be experienced more intimately in the hands of a viewer via the book format. (Faculty Sponsor: Dr. Sheli Petersen)

Supported by TWU Experiential Student Scholars Program.

5. ENHANCING LEFT-HAND TECHNIQUE –ESSENTIAL SKILLS FOR BEGINNER PIANISTS. X. Chen. Arts and Design – Music

Playing a piece of piano music, requires attention to the independence of each part, as well as the interplay the balance and cooperation between the hands. In the early stages of piano learning, the importance of the left hand is often overshadowed by the focus on the right hand's melody and technical complexity. This session is designed to highlight the left hand's critical role and address common technical challenges. In this poster, participants will explore tips and strategies to enhance left-hand technique. Through targeted exercises, repertoire, and supplementary materials, learning effective methods to strengthen and refine left-hand performance. Addressing common left-hand difficulties and provide actionable strategies to build confidence and proficiency. Participants will gain a new understanding of the left hand's role in piano. They will be equipped to overcome technical challenges, ensuring a balanced and expressive approach to their studies and a solid foundation for advanced repertoire. (Faculty Sponsor: Dr. Fanarelia GuerreroLopez)

6. EXAMINING THE ENERGY TRANSMISSION MEDIATED BY TWO LOOPS IN THE Γ SUBUNIT OF ESCHERICHIA COLI ATP SYNTHASE. A. Penny, E. Victor, M. Stankus. Sciences – Chemistry and Biochemistry

ATP is well known as the energy currency in cells. This essential molecule is primarily synthesized by the enzyme ATP synthase. This enzyme uses a proton gradient to synthesize ATP. The function of ATP synthase relies on the energy transmission between the rotor and stator complexes. Of primary interest is the γ subunit of the enzyme, which serves as the central stalk, relaying energy conversion. We aim to determine whether mutations at two conserved loops (amino acids 85-89, 176-179) in the γ subunit of ATP synthase impact the enzyme functions and efficiency. Previous research has determined that lengthening this subunit does reduce enzyme function. With this in mind, we now aim to determine the specific amino acids essential to enzyme function. We suspect that extreme alteration (deletion or mutation) of both section would reduce energy production, but aim to understand if one section can be altered without enzymatic failure. (Faculty Sponsor: Dr. Yunxiang Li)

Supported by Robert A. Welch Foundation and TWU Center for Student Research.

7. HOW DO BOYS' AND GIRLS' PERCEPTIONS OF THEIR OWN ACADEMIC SUCCESS DIFFER IN HIGHSCHOOL? M. Heisser. Human Sciences

Internalizing gender stereotypes during development can give adolescents a preconceived notion of what they are capable of achieving academically. These stereotypes play a role in the academic choices adolescents make in correspondence to their self-perceptions. In this study, I aim to focus on how boys' and girls' attitudes toward academic achievement change through their education. My research is a quantitative analysis of secondary data from 15,362 high school students who participated in the National Center for Education Statistics' Education Longitudinal Study (NCES, 2002). I will explore whether boys' and girls' perceptions of their academic success differ in high school. I'm conducting a MANOVA analysis to identify gender differences in multiple measures of perceived academic success. My hypotheses examine whether academic motivations will differ by the student's gender. The findings of my research will give a better understanding of how to create effective strategies for supporting adolescent academic development. (Faculty Sponsor: Dr. Adam Jones)

Supported by McNair Scholars Program.

8. IMPACT OF HCMV ON DRUG SENSITIVITY IN BREAST CANCER. C. Coloura, A. Martins, R. Petros, J. Spencer. Sciences – Biology

Human cytomegalovirus (HCMV) is a widespread virus that can remain dormant in the body but may be reactivated in immunocompromised conditions such as breast cancer. Studies have detected HCMV DNA and proteins in breast tumor biopsy samples, and in some cases, HCMV was associated with decreased estrogen receptor alpha (ERα) expression. We observed that HCMV infection leads to diminished levels of ERα in breast cancer cells, which could reduce the efficacy of treatments like tamoxifen and fulvestrant. In contrast, paclitaxel, a microtubule stabilizer, and doxorubicin, a topoisomerase II inhibitor, will be evaluated to test whether HCMV influences mechanisms unrelated to ERα. By comparing the EC50 values of these four treatments in uninfected and infected MCF7 cells, this research will provide insight into how HCMV infection modulates breast cancer cell responses to therapy, informing potential therapeutic strategies for HCMV- positive cancers. (Faculty Sponsor: Dr. Juliet Spencer)

Supported by NSF Award 1953448 (PRIME) and TWU Center for Student Research.

9. JOB ANALYSIS OF THE CLINICAL PROSTHETIST AND

ORTHOTIST: A SYSTEMATIC REVIEW. M. Word, S. Dillon. Kinesiology

The role of a clinical orthotists and prosthetists (O&P) has changed dramatically over the decades shifting from a mechanical to clinical focus with roles and responsibilities evolving. The purpose of this systematic review of the literature was to examine the documented job roles and responsibilities of O&P. A computer-aided literature search was conducted for research published between January 2009 and October 2024, in English language journals, and focused on the roles, responsibilities, and work environment of O&P in selected databases (e.g., PubMed, CINAHL Complete). A hand search of the table of contents for the Journal of Prosthetics and Orthotics and the Prosthetics and Orthotics International Journal was also conducted to identify additional articles. A limited number of articles specific to the job of O&P were identified and reviewed. The available literature suggests there exists a discrepancy in how scholars view, describe, and understand the job of clinical O&P. (Faculty Sponsor: Dr. Suzanna Dillon)

10. LUCRECIA KASILAG, RUTH CRAWFORD SEEGER, AND TERESA CARREÑO: THREE CULTURES, THREE UNIQUE PIANO PERSPECTIVES. K. Celestino. Arts and Design – Music

In recent years, piano pedagogy has evolved to challenge the long-standing bias that prioritizes male composers, offering students a broader and more inclusive repertoire. Incorporating works by female composers into the curriculum not only enriches students' technical and expressive development but also helps dismantle the stigma surrounding the male-dominated classical canon. This poster will highlight works of three composers: Lucrecia Kasilag, Ruth Crawford Seeger, and Teresa Carreño. It will provide pedagogical insights and techniques to diversify students' repertoires and enhance their understanding of these musical styles. (Faculty Sponsor: Dr. Fanarelia GuerreroLopez)

11. MUTATIONAL ANALYSIS OF THE B SUBUNIT: UNDERSTANDING ATP SYNTHASE PERIPHERAL STALK INTERACTIONS. A. Landeros, N. Caracena, R. Dominguez, Y. Li. Sciences – Chemistry and Biochemistry

ATP synthase is a crucial enzyme in cellular energy production, catalyzing ATP synthesis through rotational catalysis. In this study, we aim to further understand the functions of the peripheral stalks (the b subunit) in ATP synthase. Our hypothesis is that we are able to conduct mutational studies to locate the essential dimerization area of the b subunit. Experimentally, the enzymatic performance of nine enzyme variants were assessed, including ATPase activity and proton pumping strength. Our results indicate that the dimerization between b90-140 is critical for maintaining proper functions of ATP synthase. In the future work, we will further analyze the assembly and energy coupling efficiency to promote the understanding of the interactions among subunits in the peripheral stalks. These findings should provide insights into ATP synthase mechanics, with potential implications for bioenergetics and enzyme engineering. (Faculty Sponsor: Dr. Yunxiang Li)

12. RISING PRICES AND COVID-19: THE EFFECTS OF THE PANDEMIC ON THE US ECONOMY. O. Crowder. Accounting and Finance

This paper investigates the cause of the inflationary period in the US following the Covid-19 pandemic. This inflation was the result of supply chain disruptions and changes in the labor market due to the coronavirus. We will take a closer look at the monetary and fiscal policy in 2020 and the initial impact it had on the US economy. Significant changes labor market occurred during a period called the Great Resignation. Additionally, disruptions to the global supply chain created shortages in a time of increasing consumer demand. All of these factors combined to create an aggregate increase in prices across the country. This research aims to explore the different economic factors and changes in consumer behavior that contributed to the inflation we see today. (Faculty Sponsor: Dr. Mark Tengesdal)

13. SELF-DECEPTION, IMPRESSION MANAGEMENT, AND GULLIBILITY AS PREDICTORS OF RELIGIOSITY. J. Brauer, C. Hart. Social Work, Psychology, and Philosophy

In early 2024, I conducted a study examining how self-deception, gullibility, and impression management predict religiosity. The regression model was statistically significant and explained 13.0% of the variance in religiosity. Contrary to prior research, self-deception was found to be a negative predictor of religiosity. That is, people who were more religious were lower in self-deception. Due to these surprising findings, the current study was undertaken in an attempt at replication. To increase reliability, the Monotheist and Atheist Beliefs Scale (MABs) was included in the secondary study. In the initial study, I found individuals who were less self-deceptive and scored higher in impression-management were more religious. In the current study, using an additional religiosity measure, I was unable to replicate those findings. This research combines the results of each study in order to gain insight into the predictive values that come into play when measuring religiosity. (Faculty Sponsor: Dr. Christian Hart)

14. THE SUBCELLULAR COLOCALIZATION OF STRA6 AND ATP5A1. C. VanBuren, H. Everts. Nutrition and Food Sciences - Denton

Psoriasis is a chronic, inflammatory, skin condition characterized by abnormal proliferation and differentiation of keratinocytes. It is treated with narrowband ultraviolet B (UVB) irradiation and/or oral retinoids, suggesting that altered vitamin A may play a role in its etiology. Previous studies found that the vitamin A receptor STRA6 (stimulated by retinoic acid 6) is sensitive to changes in UVB irradiation. STRA6 leaves the plasma membrane in response to UVB

irradiation, but its post-UVB subcellular localization is unknown. This study examined the subcellular colocalization of STRA6 with ATP5A1, a marker of the inner mitochondria membrane, using skin tissue from C57BL/6 mice that were exposed (or not) to UVB irradiation. Double immunofluorescence was performed and examined using a Zeiss LSM900 confocal microscope. Preliminary results show no effect for UVB treatment or sex but does show a moderate correlation between ATP5A1 and STRA6, suggesting a role for STRA6 and retinol in mitochondria. (Faculty Sponsor: Dr. Helen Everts)

Supported by TWU Center for Student Research, TWU Jane Nelson Institute for Women's Leadership, TWU Quality Enhancement Plan, TWU REP.

15. THE EFFECT OF NUTRITION EDUCATION AND WALNUT BUTTER PRODUCT ON WEIGHT AND ENDOTHELIAL HEALTH IN ADOLESCENTS WITH OVERWEIGHT AND OBESITY. L. Aschenberg, K. Lewis, R. Shrouro, K. Crabtree, W. Wang, K. Davis, S. Juma. Nutrition and Food Sciences - Denton

The purpose of this study was to examine if the combination of regular consumption of a walnut-based spread and nutrition education in comparison to nutrition education alone would improve fat to muscle mass ratio and have beneficial effects on cardiovascular health by improving endothelial function and biomarkers in adolescents with overweight or obesity. A total of 80 adolescents (age 13 to 17 years) who met the study criteria were recruited for a 120-day study. Participants were randomized to either receive only nutrition education or nutrition education and 45 grams of walnut spread. Dual energy x-ray absorptiometry (DEXA) was performed on all participants at baseline and final visit to evaluate body composition. Endothelial function was assessed at baseline and final visits and blood specimens were obtained at three time points. Findings will be presented at the symposium. (Faculty Sponsor: Dr. Shanil Juma)

Supported by Funding Sources: California Walnut Commission.

16. SATELLITE GIAL CELLS AND MACROPHAGES CHANGES IN AN INFLAMMATORY OROFACIAL PAIN MODEL. B. Boyle, A. Basnet, D. Averitt. Sciences – Biology

Orofacial pain is a common condition that impacts the quality of life of individuals. The current understanding of the mechanism underlying orofacial pain is not well-developed. Trigeminal sensory neurons detect and propagate pain signals from orofacial regions whose cell bodies are in the trigeminal ganglia (TG). Inflammation contributes to orofacial pain through changes in immune interaction in inflammation sites and TG. This study aims to investigate the presence of macrophages and satellite glial cells (SGCs) in the TG during inflammatory orofacial pain models in rats. We hypothesize that macrophages and SGCs will increase in the TG after 3 days upon injecting complete Freund's adjuvant (CFA) into the right masseter muscle of rats. After three days, we collected bilateral TG and cryosectioned for immunohistochemistry (IHC). Currently, IHC for glial fibrillary acidic protein (GFAP) is being performed to identify SGCs and IBA1 to identify macrophages. (Faculty Sponsor: Dr. Dayna Averitt)

Supported by NIH NIDCR R15DE025970, TWU Center for Student Research, and TWU Experiential Student Scholars Program.

17. PREVENTION OF PLAY DEPRIVATION IN EARLY ELEMENTARY CLASSROOMS THROUGH PROPOSED PLAY TEKS. O. Lester. Honors Program

Play has decreased in early childhood classrooms due to the increased focus on state mandated academic standards (Yogman et al., 2018). However, play is essential to all domains of development and the focus on academic standards is causing an epidemic of play deprivation in the classrooms (Miller & Almon, 2009; Leibowitz, 2020). Play deprivation causes an increase in aggression, isolation, and behavioral problems, and is counterproductive in that it actually leads to poor academic performance in children (Ridgers et al., 2011: Gunner, 2021). In this study, I created a literature review on play and play deprivation, and then created Play TEKS for PreKindergarten, Kindergarten, and 1st grade to protect children's right to play in the classroom. (Faculty Sponsor: Dr. Alfred Litton)

18. MITIGATING THE ENVIRONMENTAL IMPACT OF HYDROFLUOROCARBONS (HFCS): ALTERNATIVES AND GLOBAL POLICY SOLUTIONS. A. Mitchell, H. Kouadio. Sciences – Environmental Science

HFCs (Hydrofluorocarbons) are a group of synthetic chemicals commonly used in refrigeration and air conditioning systems, known as potent greenhouse gases with a global warming potential significantly higher than carbon dioxide; they are often used as replacements for ozone-depleting substances (ODS) like chlorofluorocarbons, but their own environmental impact is a concern due to their high greenhouse gas potential. Though HFCs account for 2% of greenhouse gases, their global warming potential is much higher than CO2. This study investigated the impact of HFCs, alternatives to HFC use, and policies related to limiting the use of HFCs. The key findings include the following: 1) Impact: HFCs have a high global warming potential (GWP) with HFC-23 having a GWP of 14,800, 2) Alternatives: hydrofluoroolefins (HFOs), natural refrigerants such as CO2 with a GWP of 1 along with ammonia or hydrocarbons such as Propane – R290, 3) Policies: Kigali Amendment of 2016 was adopted by approximately 100 countries and aims to reduce HFC consumptions by more than 20% by 2047, along with the American Innovation and Manufacturing (AIM) Act in 2020 which aims to reduce HFC production by 85% by 2036. (Faculty Sponsor: Dr. Halima Kouadio)

19. LONG TERM EFFECTS OF CONTRACEPTIVES IN FEMALES.

A. Ashrafian, S. Haque, I. Zamora, Z. Badmus. Sciences – Chemistry and Biochemistry

Contraceptives are a device or drug that helps prevent pregnancy, regulate menstrual cycles, and manage conditions like polycystic ovary syndrome (PCOS). While contraceptives offer clear benefits, the long-term effects remain understudied and overlooked. Our study investigates these long-term effects, including hormonal imbalances, increased stroke risk, and potential links to severe cancers such as endometrial, ovarian, and colorectal cancer. Many women, especially young women reaching reproductive age, start using contraceptives without fully understanding the potential impacts it can have on their bodies. The issue is compounded by inadequate education, insufficient research, and associated expenses, leaving women to make life-changing health decisions without all the necessary information. With contraceptives ranging from short-term methods, e.g. hormonal pill, to permanent methods, e.g. sterilization, it is crucial to provide comprehensive education and research. Women deserve to make informed choices about their health and that starts with knowing the full story behind contraceptives. (Faculty Sponsor: Dr. Mary Anderson)

Supported by Prepared for CHEM 1101 Horizons in Chemistry and Biochemistry.

20. IMPACT OF LASER POWER ON THE SPECTRAL FEATURES OF DOUBLE AND MULTI- WALLED CARBON NANOTUBES. M. Schwickert, D. Woodring, S. Burrows, J. Beatty, N. Mirsaleh-Kohan. Sciences – Chemistry and Biochemistry

Carbon nanotubes (CNTs) are a class of nanomaterials composed of graphene sheets rolled into tubes, which can have single or multiple walls with varying diameters and lengths. They have diverse applications, including material reinforcement, electrical conductivity, and gas capture and storage. In this work, we employ Raman spectroscopy to study the spectral features of various non-functionalized double (DW) and multi-walled (MW) CNTs. Our focus is to examine the impact of the Raman laser power on DW and MW of various diameters. Determining the optimal laser power and understanding its effects on the structural features of CNTs are essential for future applications of CNT, particularly in the adsorption of solvents. To this end, the spectra of the CNTs obtained with laser powers of 2, 4, 6, and 8 mW are compared to analyze shifts in spectral peaks and structural changes. (Faculty Sponsor: Dr. Nasrin MirsalehKohan)

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21. IDENTIFICATION OF FUNGAL ENDOPHYTES OF EUPHORBIA DENTATA AND EUPHORBIA BICOLOR THROUGH PHENOTYPING AND GENOTYPING METHODS. R. Crane, J. Saldana, C. Maier, L. Handson. Sciences – Biology

Two Texas native spurges, Euphorbia dentata and Euphorbia bicolor (Euphorbiaceae), known to synthesize bioactive chemicals, were found by our lab to have endosymbiotic fungi in the intercellular spaces of their organs. Previously, we morphologically identified nine fungal species. Our main research goal is to identify the fungal secondary metabolites, since pharmacological studies are finding plant endophytic fungi as potential sources for bioactive chemicals. Cultures of endophytic fungi from E. dentata and E. bicolor were maintained through subcultures on V8 agar medium. Fungal endospores and hyphae were phenotyped using Lactophenol Cotton Blue stain on wet mount microscope slides. Fungal genera were identified using spore morphology and hyphae branching characteristics. Individual fungal species were freeze-dried, ground to powder, and DNA extracted for genotyping in order to definitely identify the fungal species. Further research will be conducted on the isolation and chemically characterizing fungal secondary metabolites for discovery of new pharmacologically active chemicals. (Faculty Sponsor: Dr. Camelia Maier)

22. EXPLORING 20TH CENTURY MELODIES: A PEDAGOGICAL JOURNEY THROUGH PROKOFIEV'S MUSIC FOR CHILDREN, OP. 65. X. Liu. Arts and Design – Music

Twentieth-century music offers a wealth of creative expression, but it can often be a significant challenge for intermediate piano students. Works from this era often feature fragmented melodies and complex rhythmic patterns, which can be daunting for learners accustomed to more traditional styles. Prokofiev's Children's Music, Op. 65 offers accessible yet engaging twentieth-century works for students to explore modern musical language. And this work can be a great entry point to help students get in touch with twentieth-century works, allowing students to explore and understand the characteristics and difficulties of twentieth-century works. This poster outlines a coherent teaching method for teaching contemporary works, focusing on Prokofiev's Children's Music, Op. 65. It will provide valuable teaching insights, suggested levels for each piece, and detailed analysis of each piece. Designed to help students master fragmented melodies and complex rhythms, thereby improving their technical level. (Faculty Sponsor: Dr. Fanarelia GuerreroLopez)

23. EVALUATING THE IMPACT OF THE GLUTAMATE RESIDUE MUTATION AT A284 IN ESCHERICHIA COLI ATP SYNTHASE. Y. Kim, A. Gigi Scaria, Y. Li. Sciences – Chemistry and Biochemistry

ATP synthesis is a vital process for obtaining energy for cellular processes. Therefore, understanding how ATP synthase works is important. In this study, we focus on how mutations on the glutamate residue, α284 of the bacteria, E.coli, affects the synthesis of ATP. Mutants of ATP synthase were engineered using site-directed mutagenesis and a phenotype analysis was performed. The growth yield assays of ATP synthase demonstrated that ATP synthase with

αE284D/N/Q mutations perform almost similarly to the wild type (> 90%), whereas, αE284C/L mutations demonstrated lower yields (~80%). These results signify that the α284 residue of glutamate could potentially play a role in the function of ATP synthase, especially with the rotor/stator interactions. (Faculty Sponsor: Dr. Yunxiang Li)

Supported by Robert A. Welch Foundation, NSF Award 1953448 (PRIME), and the Camille and Henry Dreyfus Foundation.

24. ECLIPSE: ENHANCED CONTAINERIZED LAB INFRASTRUCTURE FOR PLATFORM- INDEPENDENT STUDENT ENGAGEMENT USING VIRTUALIZATION. S. Chhuon. Sciences – Computer Sciences

The ECLIPSE Project addresses disparities in access to computing resources in computer science courses. This research project explores the application of virtualized infrastructure and containerization to provide platform-independent, remote access to lab environments, creating equitable learning opportunities for students with heterogeneous hardware and software. Current resources often depend heavily on students having specific hardware or software, creating an inequitable learning environment. Utilizing hypervisors, VLANs, and automated provisioning, the infrastructure delivers Virtual Machines or containers tailored to specific requirements in computer science. By automating the provisioning and management of virtualized resources, ECLIPSE enhances the speed of deployment, simplifies maintenance, and minimizes the need for specialized local hardware to allow students to access the same consistent environment from any device. Ultimately, this project aims to create a sustainable and inclusive infrastructure for CS education that can quickly expand to other disciplines. (Faculty Sponsor: Dr. David Gardner)

Supported by NSF Award 1953448 (PRIME) and National Science Foundation HIS- STEM Award #1953448.

25. CHEMORESISTANCE MECHANISMS OF BREAST CANCER CELLS TO A NOVEL ANTI- CANCER P300 INHIBITOR. C. Golly, E. Shin, K. Underbrink, A. Gekombe, M. Bergel. Sciences – Biology

Multidrug resistance (MDR) remains a major challenge in chemotherapy, limiting treatment effectiveness and compromising patient outcomes. This study investigated genes associated with MDR in the human breast adenocarcinoma MCF-7 cells that have developed resistance to our patented anti-cancer drug, JJMB9. To develop these resistant MCF-7R cells, we gradually exposed the parental MCF-7 cells to JJMB9, achieving a GI50 of 320 µM compared to the GI50 of 6 µM in the sensitive parental cells. Notably, these resistant cells retained sensitivity to cisplatin. RNA sequencing of MCF-7R cells validated by RT-qPCR and Western blotting revealed three genes as potential MDR-associated genes: ABCB1, GJB6, and GSTT2B. ABCB1 is ATP binding cassette transporter subfamily B1, GJB6 is gap junction beta 6, and GSTT2B is glutathione S-transferase theta 2B. We suggest that targeting these resistant cells with chemical inhibitors to the resistance-associated proteins in combination with JJMB9 may provide a promising approach to overcoming MDR. (Faculty Sponsor: Dr. Michael Bergel)

26. BUILDING FOCUS IN BEGINNER PIANO STUDENTS: STRATEGIES FOR EFFECTIVE PRACTICE. A. Li. Arts and Design – Music

In a world where the average human attention span has diminished due to the rapid pace of modern life, fostering focused practice in piano students has become increasingly challenging. As educators, it is essential to address this issue by equipping students with effective strategies to maintain concentration and maximize their practice time. This poster presentation is designed to address these challenges by offering practical techniques and strategies specifically tailored for beginner students. Its objective is to equip piano teachers with effective methods to help students enhance their focus during practice sessions, making their practice time more productive and enjoyable. This, in turn, will increase their efficiency and overall progress. By fostering a more engaging and structured practice routine, educators can help their students develop the focus and resilience necessary for long-term success in their musical studies. (Faculty Sponsor: Dr. Fanarelia GuerreroLopez)

27. A PEDAGOGICAL GUIDE TO EXPLORING TONE COLOR THROUGH PHILIP GLASS'S METAMORPHOSIS. G. Manghera. Arts and Design – Music

Piano students of all levels encounter various technical challenges in their daily practice, often focusing on fundamentals like note accuracy, articulation, and rhythm. However, one crucial element that is frequently overlooked is tone color. Minimalist compositions, characterized by gradual pacing, repetitive patterns, and extended textures, offer students an opportunity to focus more intently on sound quality and tone production without the distraction of technical complexity. This session proposes the use of Philip Glass's Metamorphosis (a set of minimalist compositions for piano, suitable for intermediate-level students) as an effective tool for exploring tone color through practical strategies. Piano lesson teachers will be equipped with an accessible and effective approach to teaching tone color, expanding students' expressive capabilities by allowing them to experience the nuanced beauty of minimalist music. (Faculty Sponsor: Dr. Fanarelia GuerreroLopez)

Session 5. Wednesday, April 23, 2:40 pm – 4:00 pm Student Union 2300 (Southwest Ballroom)

1. A FIRST-PRINCIPLES COMPUTATIONAL INVESTIGATION OF STRUCTURAL CHARACTERISTICS, ABSORPTION AND INTERACTIVE COUPLING BEHAVIOR OF 12-5-12 CATIONIC GEMINI SURFACTANT WITH ORGANIC ANIONS. S. Bristi, N. MirsalehKohan, R. Sheardy, S. Bachofer, S. Lin. Sciences –

Chemistry and Biochemistry

Cationic surfactants are important in exhibiting unique structural, electronic, and coupling behaviors in different environments due to their dimeric structure. These surfactants are widely used in various industries including pharmaceuticals and materials science. In this study, we conduct a first-principles computational investigation of the 12-5-12 cationic Gemini surfactant ($((CH_3(CH_2)_{11}(CH_3)_2\text{-}N^+\text{-}(CH_2)_5\text{-}N^+\text{-}(CH_3(CH_2)_{11}(CH_3)_2))$), focusing on its structural characteristics, electronic properties, and interactive coupling behavior. Density Functional Theory (DFT) calculations are employed to optimize molecular structures and analyze fundamental properties across three distinct conformers: parallel, wing, and bent. Comparative stability assessments provide insight into critical surfactant characteristics such as critical micelle concentration (CMC), micelle size, and overall stability. Additionally, interactive coupling behavior is explored through absorption energy calculations of 12-5-12 with various organic anions. Gaussian and DFT computations facilitate molecular optimization and energy analysis, while Material Studio is utilized for sorption calculations. (Faculty Sponsor: Dr. Manal Omary)

2. ANTIPROLIFERATIVE ACTIVITY OF EUPHORBIA DENTATA IN T47D, MDA-MB 231, AND MCF-7 CANCER CELL LINES. A. Ifagbayi-Adeniran, M. Rumpa, C. Maier. Sciences – Biology

Breast cancer treatment mainly includes surgery, radiation, chemotherapy, and hormone therapies, but these often have significant long-term side effects. Research is focusing on finding new anticancer agents with better efficacy and fewer side effects. The use of medicinal plants in cancer treatment has been increasing, with a reported 80% rise in interest by the WHO. This study examines the effects of Toothed Spurge, Euphorbia dentata, extracts on ER-positive MCF-7 and T47D, and triple-negative MDA-MB-231 breast cancer cells. The plant, native to Texas, was used to obtain two extracts: an ethanol extract, rich in flavonoids and a xylene extract containing diterpenes. The xylene extract reduced cell viability at concentrations of 16 µg/mL for T47D and 62.5 µg/mL for MDA-MB-231 and MCF- 7. Preliminary results suggest that the xylene extract triggers apoptosis in T47D cells. Future research will focus on isolating and studying the plant active chemicals for potential cancer therapies. (Faculty Sponsor: Dr. Camelia Maier)

Supported by NSF Award 1953448 (PRIME) and TWU Experiential Student Scholars Program.

3. BUILDING POSITIVE CLASSROOM CULTURE: LEVERAGING RESTORATIVE PRACTICES TO IMPROVE STUDENT ENGAGEMENT AND ACADEMIC OUTCOMES. P. Krause. Teacher Education

This project focused on implementing restorative practices to address student engagement challenges at a diverse and economically disadvantaged elementary school. The school struggled with increasing office referrals and decline in student engagement, affecting academic performance. The goal was to improve classroom culture by reducing behavioral disruptions and increasing student engagement through Restorative Practices. The approach included professional development for staff, along with teacher support through peer observations and feedback surveys. Continuous data collection enabled adjustments based on teachers' needs, ensuring the approach remained responsive and aligned with campus improvement goals. The impact of the plan was assessed using both quantitative and qualitative data. Student engagement rose from 19% to 25% within two months and reached 32% after five months. Qualitative data from student reflections highlighted emotional growth, improved behavior, and increased academic involvement. This demonstrates that Restorative Practices are effective in fostering a supportive school culture and improving student outcomes. (Faculty Sponsor: Dr. Amanda Hurlbut)

4. COMPARING VISUAL AND AUDITORY EXPERIENCES IN DEVELOPING TRANSITORY AWE AND SUBSEQUENT HUMILITY. E. Mitchell, A. Rivers. Social Work, Psychology, and Philosophy

Objectives: The purposes of this study: 1) compare ratios of strengths/weaknesses (humility) after watching one video (visual/audio (V/A), audio only (A/O), or visual only (V/O)), 2) compare five self- reported emotions across the groups, and 3) determine the relationship between humility and emotions as well as self-reported humility. Methodology: Participants watched a randomly selected video and completed an online survey with questions related to experienced emotions and their strengths/weaknesses. Results: This study found no significant difference in the ratio of strengths/weaknesses. There was a significant difference among the three conditions for amazement at $F(2,121) = 4.828$, $p = .010$. Overall, the groups with a visual component had significantly more self-reported amazement. There were no significant relationships between the log ratio of strengths/weaknesses and humility or emotions. Conclusions: Participants presented with visual stimuli had significantly higher levels of amazement. However, there were no differences in humility across the groups. (Faculty Sponsor: Dr. Alannah Shelby Rivers)

5. DETERMINING THE ROLE OF ADAMTS PROTEASES IN TGF-B SIGNALING IN C. ELEGANS. O. Honey, T. Gumienny. Sciences – Biology

The TGF-β signaling pathway is crucial for animal development, tissue homeostasis, and disease progression, but its regulation in a time- and tissue-specific manner is not fully understood. In mammalian systems, studying TGF-β signaling is challenging because of its complexity and redundancy. The roundworm C. elegans offers a more accessible model, as it conserves key genes involved in TGF-β signaling and potential regulators, a protease family and extracellular matrix (ECM) components. DBL-1, a C. elegans TGF-β superfamily member, regulates body size and tissue morphogenesis, with its signaling modulated by ECM

component LON-2. Our study aims to determine if ADAMTS proteases cleave LON-2 to facilitate proper DBL-1 signaling during development. We will investigate effects of ADAMTS loss on LON-2 processing using western blotting, and effects on LON- 2 localization and levels by confocal microscopy. Understanding the interactions between DBL-1, LON-2, and ADAMTS proteases could provide new insights into TGF-β pathway regulation and disorders. (Faculty Sponsor: Dr. Tina Gumienny)

Supported by Funded by TWU Biology and National Institutes of Health 5R01GM097591.

6. DIARY OF A CHILD: A PEDAGOGICAL EXPLORATION OF A CHILDREN'S SUITE BY ERNESTO LECUONA. E. Fernandez. Arts and Design – Music

In Western music education, the contributions of Cuban musicians are often overlooked. One composer who significantly influenced traditions of Cuban and Afro-Cuban music is Ernesto Lecuona. A celebrated pianist and composer, Lecuona gained worldwide recognition, popularizing Latin and Afro-Cuban dance music across various countries and cultures, sparking a broader interest in Cuban music. Lecuona composed numerous piano suites featuring popular Afro-Latin styles, catering to a wide range of pianists, from children's pieces to more advanced works for virtuoso musicians. Among these is his children's suite, The Diary of a Child. This poster aims to showcase the remarkable achievements of Ernesto Lecuona, providing key information on his life and examining his significant impact on Latin piano repertoire. It will feature excerpts from The Diary of a Child to highlight its pedagogical value and will discuss benefits of incorporating selections from this early-advanced/advanced suite to diversify a student's musical experience. (Faculty Sponsor: Dr. Fanarelia GuerreroLopez)

7. GEOMETRIC SERIES REVISITED: HOW MUCH DO I NEED TO RETIRE IF I WANT TO LIVE HIGH, NORMAL, OR MODEST? L. Davis, L. Bryant, E. Cushman, E. Grigorieva, PhD. Sciences – Mathematics

Young adults do not think about retirement or how they will live after they stop working. There are different types of funds that allow you to save your income to use later, not necessarily even in retirement. Anything can happen, sometimes unforeseen circumstances force us to stop working and live simply on what we have. How can we make sure that our life is not poverty? The key to the answer is to understand the mathematics behind all these processes (compound interest, annuities, 401K, etc.). In this study, we derive important financial formulas using the properties of geometric sequences and series. Various financial scenarios for saving money are investigated. (Faculty Sponsor: Dr. Ellina Grigorieva)

8. HYDROFLOUROCARBONS. A. Butcher, C. Morse, J. McKinney, J. Alvarado, H. Kouadio. Sciences – Environmental Science

Hydrofluorocarbons (HFCs) are compounds frequently used in refrigeration and air conditioning systems. They were initially introduced as substitutes for ozone-depleting substances like chlorofluorocarbons. However, HFCs have a greenhouse gas effect that is hundreds to thousands of times stronger than carbon dioxide. Currently, they represent about 2% of global greenhouse gas emissions by volume. Despite their relatively small volume, HFCs play a significant role in global warming, similar to other greenhouse gases. If HFC emissions continue, this could lead to more extreme weather events, rising sea levels, and changes in ecosystems. Additionally, some studies suggest that the effects of climate change can lead to public health issues, including heat-related illnesses and respiratory problems due to poorer air quality. To lessen their negative environmental impact, a practical strategy is to decrease HFC production. Additionally, using HFC- HFO blends, HFCs with lower global warming potential, and natural refrigerants as alternatives can effectively tackle this issue. (Faculty Sponsor: Dr. Halima Kouadio)

9. LEVERAGING CONNECTIONS: THE STRATEGIC IMPORTANCE OF SOCIAL MEDIA MARKETING. R. Hernandez. Management and Marketing

Social media marketing has become an essential component of modern digital marketing strategies, offering marketers tools for leveraging platforms with billions of active users, building brand awareness, and driving consumer behavior. This poster explores the strategic importance of utilizing social media, emphasizing its role in connecting businesses with target audiences through tailored content, influencer partnerships, and paid advertising. It highlights the motivations behind social media use for consumers, categorized into the 5Cs: Consume, Connect, Control, Compete, and Create. Additionally, it discusses the significance of tracking and measuring performance to refine marketing strategies and optimize engagement. A survey conducted among Texas social media users provides insights into consumer attitudes, behaviors, and platform preferences, reinforcing the value of social media marketing. The findings emphasize the necessity for businesses to adopt the usage of such strategies to remain competitive and relevant in an evolving digital landscape. (Faculty Sponsor: Dr. David Rylander)

10. MODELING POPULATION GROWTH WITH FOOD SUPPLY USING DIFFERENTIAL EQUATIONS. D. Schletewitz, K. Wheeler, C. Slater, J. Hayward. Sciences – Mathematics

Population growth and food supply are two interconnected phenomena that have profound implications for societal stability. A system of differential equations provides a powerful mathematical framework to study these dynamics by capturing the interactions between population size, food production, and resource consumption rates. Population growth depends on multi-trophic level interactions; this project explores the nuanced relationship between the ecological factors that impact food production and the

interplay of population. Specifically, we will explore models that factor the amount of food on the growth of rate of food and the growth rate of population, and the effect of population on the growth rate of food and the growth rate of population. Climate conditions of temperature and precipitation are considered so that several two-dimensional systems of ordinary differential equations can model the nuanced interaction between population and food supplies. (Faculty Sponsor: Dr. Junalyn NavarraMadsen)

11. OPTIMIZING CUCUMBER FERMENTATION: ENHANCING ACETIC ACID PRODUCTION USING SUGIYAMAELLA LIGNOHABITANTS. S. Gurung, X. Du, D. Wang. Nutrition and Food Sciences - Denton

Although cucumbers are commonly used for pickling, optimizing substrate availability and acid production such as acetic acid during cucumber fermentation remains challenging. Natural acetic acid plays a key role as flavoring agent and preservative. This study examines the potential of Sugiyamaella lignohabitans, a yeast capable of degrading complex carbohydrates, to enhance fermentable substrate concentrations. By increasing sugar availability, this method stimulates Acetobacter acetii activity, potentially improving acetic acid production while optimizing substrate utilization. Fermentation efficiency was assessed through °Brix, pH, titratable acidity, and acetic acid levels quantified using HPLC. Results showed °Brix declining from 2.8 to 1.7 in 48 hr, pH reaching 3.12 at 96 hr, titratable acidity peaking at 12.12 mg/mL at 120 hr, and acetic acid at 4.06 mg/mL at 216 hr, coinciding with the highest A. acetii population (3.5×10^6 CFU/mL). These findings highlight microbial synergy's potential to enhance acetic acid production. (Faculty Sponsor: Dr. Xiaofen Du)

Supported by the TWU Quality Enhancement Plan (QEP) Grant.

12. PAIN CHARACTERISTICS AND PATIENT-REPORTED CLINICAL OUTCOMES IN FEMALE CHRONIC PAIN PATIENTS WITH AND WITHOUT FIBROMYALGIA – AN EXPLORATIVE STUDY. C. Smitham, N. Wilkinson, S. Wang-Price, J. Zafereo, U. Makris. Physical Therapy - Dallas

As not all individuals with chronic pain (CP) will develop fibromyalgia (FM), identification of phenotypes to differentiate patients with FM and other CP may assist in early diagnosis and plan of care. The purpose of this explorative study was to compare pain characteristics and patient-reported clinical outcomes between CP patients with and without FM. Data was extracted from an ongoing Dallas Heart and Minds study, consisting of female adults ≤ 65 years of age and having pain an > 3 months. Using the 2016 revised FM diagnostic criteria, including widespread pain index (WPI) and symptom severity scale (SSS) scores, subjects were dichotomized into two groups: FM group (n = 13) and CP group (n = 72). The FM group had higher WPI and SSS scores, current pain level, worst and average pain level in the past 4 weeks, pain catastrophizing level, and pain interference level than the CP group. (Faculty Sponsor: Dr. Sharon Wang-Price)

13. RAPID RESPONSE OR CODE: PRIORITIZE THE LOAD. J. Alvarez. Nursing - Dallas

Early recognition of patient deterioration, prioritization of care, and timely intervention significantly reduce mortality and prevent escalation into code blue situations. However, novice nurses often struggle with prioritization due to knowledge gaps, leading to delays in critical interventions. This project utilizes a virtual simulation designed to actively engage senior undergraduate nursing students' clinical judgment and prioritization skills in recognizing and responding to patient deterioration. This simulation, shaped under the clinical judgment model, presents scenarios that require students to identify and interpret patient data, prioritize patient care, justify their clinical reasoning, implement appropriate interventions, and evaluate the outcomes of their interventions. The student's ability to differentiate between a rapid response and a code blue, prioritize patients and patient care, and implement appropriate interventions determine success. This simulation strengthens students' decision-making skills by addressing knowledge deficits, reinforcing prioritization strategies, and utilizing reflection questions to prepare them for real-world clinical scenarios. (Faculty Sponsor: Dr. Cecilia Wilson)

14. STATISTICAL ANALYSIS OF FIRST-MOVE STRATEGY AND GAME DYNAMICS IN 11X11 HEX. E. Tadlock, M. Moore. Sciences – Mathematics

Hex is a two-player strategy game where the players' goal is forming an unbroken path across a board of hexagonal spaces. Danish mathematician Piet Hein invented the game in 1942, and subsequently, American mathematician John Nash introduced it at Princeton in 1948. Nash also proved that the first player has a winning strategy, but how that plays out in real games is less clear. This project examines 11x11 Hex games to analyze first-move selection, center versus edge openings, and game duration. We analyze over 2,000 games, with 119 unique starting moves, using manually collected data from games played on PlayHex.org. We apply chi-square tests to assess whether move distributions deviate from randomness, ANOVA and t-tests to analyze the relationships between first moves, game lengths, and win rates, and proportion tests to evaluate win rates by starting move. Our findings provide support to existing mathematical principles underlying optimal Hex gameplay. (Faculty Sponsor: Dr. Micah Thornton)

15. UBR5 BINDS TDP43 FRAGMENTS TO COMBAT PROTEIN AGGREGATION IN NEURODEGENERATIVE DISEASES. W. Mirembe, Y. Kasu, C. Brower. Sciences – Biology

Neurodegenerative diseases, such as Amyotrophic Lateral Sclerosis (ALS) and Frontotemporal Dementia (FTD), are linked to protein misfolding and aggregation, often caused by

failures in cellular clearance mechanisms. TDP43, a key protein implicated in these diseases, undergoes proteolytic cleavage, generating fragments such as TDP43219 and TDP43247 that are associated with disease pathology. Previously, we identified the Arg/N- degron pathway and BAG6 as critical facilitators of fragment clearance via the ubiquitin-proteasome system. Our recent findings suggest that UBR5, an E3 ubiquitin ligase and a component of the Arg/N-degron pathway, plays a pivotal role in degrading TDP43 fragments. Interestingly, we found that UBR5 recognizes TDP43 fragments through mechanisms distinct from those of BAG6 or the Arg/N-degron pathway. Additionally, UBR5 targets other proteins associated with neurodegenerative diseases, suggesting it may have a wider role in protecting cells from protein aggregation. Further investigation into UBR5's mechanisms could uncover new therapeutic strategies for treating neurodegenerative diseases driven by protein aggregation. (Faculty Sponsor: Dr. Christopher Brower)

16. SUNSCREEN: BEYOND THE LABELS. M. Mendez, A. Myers, O. Hoang, J. Weeks. Sciences – Chemistry and Biochemistry

Melanoma is associated with overexposure of ultraviolet (UV) radiation, a leading form of skin cancer. As a preventative, a broad-spectrum sunscreen is recommended to reflect UVA radiation and absorb UVB radiation. This topical powerhouse is designed to protect your skin (epidermis) and underlying tissue layers from UV, which can also cause DNA damage and sunburn. A few compounds (e.g., avobenzone & oxybenzone) have been approved for sunscreen production; some may be carcinogenic or have toxicity concerns to humans and coral reefs. Some can cause hormonal disruption or allergic reactions. Alternatives to FDA approved compounds include Mexoryl (used in Europe), which has similar broad spectrum radiation protection to zinc oxide (common in America). Understanding the balance between effectiveness and safety is crucial in advancing personal and environmental health. While many of these compounds have become widely used, they may pose harmful effects that should not be overlooked (read labels). (Faculty Sponsor: Dr. Mary Anderson)

Supported by Prepared for Horizons of Chemistry and Biochemistry.

17. SIRPΓ MODULATES ACTIVATION AND PRO-INFLAMMATORY RESPONSE FROM NAÏVE CD8 T CELLS IN HUMANS. M. Morse, V. Reddy, S. Uppu, S. Juma, S. Sinha. Sciences – Biology

Signal Regulatory Protein gamma (SIRPγ) is selectively expressed on T-cells in the human immune system, but its precise role remains unclear. This study investigates the effects of SIRPγ knock-down (SIRPγ-KD) on phenotype, signaling pathways, and cytokine production in naïve CD8 T-cells. We compared SIRPγ-KD cells to control cells treated with scrambled siRNA and assessed cells from healthy donors with varying SIRPγ levels. SIRPγ-KD significantly reduced CD27 expression on naïve CD8 T-cells, independent of their activation status. In healthy donors, lower SIRPγ levels correlated with a higher frequency of CD45RO-CD27low naïve CD8 T-cells. SIRPγ-KD also increased the expression of adhesion molecules CD11a and CD49d and enhanced Lck phosphorylation upon sub-optimal stimulation. Furthermore, SIRPγ-KD naïve CD8 T-cells showed elevated secretion of pro-inflammatory cytokines (IL-2, IL-17E, IL-32α) and chemokines (CXCL11, CXCL12). These results suggest that SIRPγ is crucial for maintaining CD27 expression and regulating T-cell activation. (Faculty Sponsor: Dr. Sushmita Sinha)

Supported by NIH 1R15NSO95317-01A1, TWU Chancellor's Research Scholars Program; TWU Center for Student Research, and TWU Experiential Student Scholars Program.

18. PERCEPTIONS OF THE TWU COLLEGE CAMPUS FOOD ENVIRONMENT. P. Ravinuthala, F. Brito Silva, W. Wang, K. Davis. Nutrition and Food Sciences - Denton

Purpose: The primary purpose of this study was to assess Texas Woman's University (TWU) students' satisfaction with the accessibility, affordability, and healthfulness of the food environment across all three campuses. A secondary aim was to determine the relationship of the student's food security status with their perception of the food environment. Methods: A food environment and FS survey was emailed to all TWU students via a listserv. Analyses were conducted in SPSS and a one-way ANOVA to assess satisfaction with factors by campus. Results: Participants were 617 TWU students (498 from Denton; 65 Houston; and 54 Dallas). Students on the Denton campus were more satisfied with food options (M=3.40±1.05) compared to Houston (M=2.60±1.12) and Dallas (M=2.81±1.13) campuses ($P<0.001$ for both). Conclusion: Most of the participants on the traditional campus reported higher rates of satisfaction with and access to healthy food. Satisfaction and accessibility on smaller, health sciences campuses were lower. (Faculty Sponsor: Dr. Kathleen Davis)

19. OPTIMIZING STAINING AND QUANTIFICATION METHODS FOR 3T3-L1 ADIPOGENIC DIFFERENTIATION USING OIL RED O AND NILE RED. S. Ruiz, M. Bergel. Sciences – Biology

Adipogenic differentiation of 3T3-L1 preadipocytes is a widely used model to study fat cell development and metabolism. Accurate staining and quantification of lipid accumulation are essential for evaluating differentiation efficiency. This study investigates the optimal method for staining and quantifying 3T3-L1 adipocyte differentiation using Oil Red O (ORO) and Nile Red (NR) staining. ORO is a traditional histological stain that binds neutral lipids, allowing visual and spectrophotometric quantification, whereas NR is a fluorescent dye enabling flow cytometry and imaging-based lipid quantification. We systematically compare staining intensity, specificity, quantification accuracy, and reproducibility across different fixation protocols, staining conditions, and imaging techniques. Our findings highlight key

advantages and limitations of each method, providing an optimized protocol for accurate and consistent adipogenic assessment. This research aims to enhance the reliability of adipocyte quantification, facilitating studies on obesity, metabolism, and drug screening. (Faculty Sponsor: Dr. Michael Bergel)

20. MORALS AND COVID-19. G. Medina, D. Choi. Social Work, Psychology, and Philosophy

Morality has shaped societal norms and ethical frameworks across cultures and time periods. This literature review explores morality from philosophical, psychological, and anthropological perspectives, to better understand its underlying influence on humanity. Additionally, this literature reviews some of the underpinnings of moral injury (MI), another psychological phenomena and how it might have been influenced by morals evolution. MI is the internal distress one might experience following perceived moral transgressions or perceived betrayals. Furthermore, morality is analyzed through a disease-avoidance lens, emphasizing how moral values are transmitted socially, akin to the spread of contagions (Oaten et al., 2009). The COVID-19 pandemic serves as a contemporary case study, illustrating how moral norms, decision-making, and moral injuries emerged in response to collective challenges and ethical dilemmas. This review underscores the dynamic nature of morality, its susceptibility to external influences, and the need for continued interdisciplinary research to understand its development and societal impact of morality. (Faculty Sponsor: Dr. Dowon Choi)

21. MIGRATORY GRIEF AND DEPRESSION: EMOTION REGULATION AMONG KOREAN IMMIGRANTS. H. Choi, M. Kim, R. Manriquez, S. Ali, C. Shin. Social Work, Psychology, and Philosophy

Migratory grief, marked by loss of culture, language, and familiarity, can contribute to depression in immigrant populations. Despite evidence linking grief to depression, little research has explored protective factors that mitigate this risk. Emotion regulation strategies—such as cognitive reappraisal, acceptance, and emotional support seeking—are key to mental health outcomes, particularly for Korean Americans balancing collectivist values with individualistic societal pressures. This study recruits 330 first-generation Korean immigrants to assess how emotion regulation moderates the relationship between migratory grief and depression. Using the Migratory Grief and Loss Questionnaire, Emotion Regulation Strategies Scale, and PHQ-9, multiple regression analyses will examine how different strategies influence mental health. Findings will inform culturally tailored interventions that support Korean American immigrants' adjustment and well-being. (Faculty Sponsor: Dr. Mijin Kim)

22. I'M A MOTHER, THEN I'M A BODY: REDEFINING MOTHERS' EXPERIENCES OF BODY IMAGE. S. Dali. Social Work, Psychology, and Philosophy

Motherhood and body image hosts a complicated relationship (Fox & Neiterman, 2015). Beyond mere transference of their own beliefs about food and weight to their daughters (Cooley et al., 2008), mothers actively shape bodily perception (Bruch, 1974). But how are mothers ultimately transformed in transferring their beliefs about bodies to the next generation? The current study draws on interviews conducted with mothers of college-aged girls and their daughters to explore mothers' lived experiences with body image throughout motherhood. Mothers and daughters responded to vignettes to discuss what it meant to engage in or challenge problematic behaviors around body image in everyday life. Braun and Clarke's (2022) Reflexive Thematic Analysis was utilized to code interviews. Discovered were two central themes: Motherhood Heightens Normative Discontent and Motherhood is a Transformative Role. An additional subtheme, Motherhood Household Duties are Critical for Body Image Influence, related specifically to the intergenerational inheritance of beliefs. (Faculty Sponsor: Dr. Lisa Rosen)

Supported by TWU Jane Nelson Institute for Women's Leadership.

23. HOW MIGHT CYTOSKELETON LINK ALZHEIMER'S AND HERPESVIRUS? D. Gaibor Verdezoto, L. Hanson, D. Hynds. Sciences – Biology

There is evidence that herpesviruses may contribute to development of Alzheimer's disease. A marker of Alzheimer's disease is excess phosphorylation of the cellular protein tau, best known for stabilizing cellular microtubules. When it is over phosphorylated this function may be affected. Tau can carry out other functions that can be altered by its over phosphorylation. One that has been recently related to Alzheimer's disease is polymerization of actin. Our lab has shown that mouse cytomegalovirus (MCMV), a type of herpes virus, causes changes in phosphorylation of tau. Usually this is an increase but in macrophages is a reduction. I am infecting macrophages with MCMV and comparing actin levels of polymerization and stability in actin and tubulin with uninfected cells, to see how these correlate with the phosphorylation of tau. Results of these studies could lead to a better understanding of possible roles of tau phosphorylation and herpesviruses in Alzheimer's disease. (Faculty Sponsor: Dr. Laura Hanson)

24. EUPHORBIA BICOLOR REDUCES BURN-INDUCED PAIN BEHAVIOR IN FEMALE AND MALE RAT MODELS. A. Canales, T. Olaoluwa, D. Averitt. Sciences – Biology

A third-degree burn damages all skin layers, often leading to chronic pain. Current treatments, including NSAIDs, opioids, and gabapentinoids, have undesirable side effects. Euphorbia bicolor, a Texas-native plant, has shown analgesic potential for burn pain relief. We hypothesize that E. bicolor alleviates pain in rat models with full-thickness burns. Pain behavior was

assessed using the Mechanical-Avoidance Conflict System at baseline and 72 hours post-injury. At 72 hours, male and female burn groups exhibited increased latency to escape, indicating higher pain levels compared to the male and female sham groups. Additionally, burn groups showed elevated TRPV1, a pain and heat-detecting ion channel. E. bicolor treatment reduced pain behaviors, reflected in decreased escape latency. These findings suggest E. bicolor may serve as an alternative burn pain treatment. (Faculty Sponsor: Dr. Dayna Averitt)

25. DEVELOPING A CRISPR/PITCH SYSTEM FOR FLUORESCENT TAGGING OF ATE1. G. Escobar Verdezoto, K. Budhathoki, C. Brower. Sciences – Biology

CRISPR/Cas9 is a powerful tool for precise DNA modifications. For example, it has been used to study gene function through knock-out approaches in various organisms. Within the CRISPR toolset, CRISPR/Cas9-mediated "PITCh" (Precise Integration into Target Chromosome) enables efficient gene knock- in by repairing Cas9-induced double-stranded breaks using repair templates with short homologous sequences (5–25 bp). Our lab is interested in the functional significance of LIAT1's interaction with ATE1. Using PITCh, we will tag endogenous ATE1 with a fluorescent protein to track its localization in cells. For this, we will co-transfect pX330 encoding Cas9 and a guide RNA targeting the ATE1 gene, pBluescript containing a repair template, and pXG25 encoding Cas9 and a guide RNA targeting the PITCh sequence. Following transfection, knock-in cells will be identified through fluorescence and correct targeting will be confirmed via PCR and DNA sequencing. (Faculty Sponsor: Dr. Christopher Brower)

26. CURRENT RATIO, CURRENT VALUE, BUSINESS CASH FLOW, PROFITABILITY. S. Hernandez, A. Umutoni, A. Hameon, R. Bashir. Sciences – Mathematics

Many businesses want to expand their production or increase their inventory. So, they plan to borrow money from the bank, but when they borrow money, they increase both their assets and liabilities. How can this be done safely and how much can you borrow to stay afloat and make a profit? Mathematically, this can be explained using the current ratio formula. On the other hand, if you invested X dollars in a business, how do you know whether this business is profitable or not? You can watch annual cash flow! By finding the present value of all cash flows and comparing it to the initial investment, you can see if the decision was correct. In this study, we show how a simple compound interest formula can help solving many business problems and how, using knowledge of mathematics, a person can repay a loan by creating her own preferred schedule. (Faculty Sponsor: Dr. Ellina Grigorieva)

27. CLUSTER B PERSONALITY DISORDERS. E. Rivera, G. Medina, J. Garcia. Social Work, Psychology, and Philosophy

There's a growing interest in research and clinical practice surrounding cluster B personality disorders. Despite these growing interests and advancement there are still plenty of misunderstandings and stigma behind these personality disorders. The goal of this literature review is to have a more comprehensive understanding of cluster B personality disorders. One of the current barriers for researchers and clinicians alike is the stigma surrounding these diagnoses, such as misdiagnosis and a lack of treatment options. Misdiagnosis has also impacted our gap of knowledge as it directly influences accuracy of clinical trials alongside making sure people receive the most effective treatment. (Faculty Sponsor: Dr. Dowon Choi)

28. BEHAVIOR DEFICITS IN MECP2 KNOCKOUT MOUSE MODEL OF AUTISM MAY IMPROVE THROUGH EARLY SOCIAL AND ENVIRONMENTAL ENRICHMENT. N. Nasiru, P. Frayre, E. Na. Social Work, Psychology, and Philosophy

Autism spectrum disorder (ASD) is a neurodevelopmental condition with a rising prevalence in the U.S., from 1 in 150 in 2000 to 1 in 36 in 2020. It is characterized by difficulties in learning, memory, social interactions, communication and repetitive behaviors. While ASD understanding has progressed, it still remains unclear how early intervention impacts brain function. Using a methyl-CpG binding protein 2 (MeCP2) knockout (KO) mouse model of ASD, KO and wildtype (WT) mice were weaned into single house conditions (SH) or environmental enrichment (EE) conditions, with EE providing group housing, varied toys and running wheels. After 12 weeks, behavior tests from elevated plus maze and dark light test demonstrated reduced anxiety-like behaviors, while increased social interaction was seen using social interaction testing, in EE-KO mice compared to SH-KO mice. These findings suggest that early intervention may improve behavioral deficits in MeCP2 KO mouse models of ASD. (Faculty Sponsor: Dr. Elisa Na)

Supported by TWU Start Up Funds, TWU Woodcock Institute.

29. ANALYZING ENERGY TRANSFERENCE IN THE Γ SUBUNIT OF ESCHERICHIA COLI ATP SYNTHASE THROUGH TERMINUS EXTENSION. E. Victor, A. Penny, M. Stankus, Y. Li. Sciences – Chemistry and Biochemistry

Adenosine Triphosphate (ATP) is recognized as the cell's energy resource that is primarily synthesized by the enzyme ATP synthase. This enzyme is composed of two multisubunit subcomplexes which form a rotating component and a stationary element. Energy transmission between these components is vital for the function of ATP synthase. As one of the rotary elements the γ subunit is the core component for energy conversion and the main focus of our research. Our research aims to determine whether addition of 4,8, 12 or 14 alanines to the N or C terminus in the γ subunit would affect the enzyme's function and its energy conversion efficiency. We hypothesize that significant alterations, in this case, addition of alanine to the N and C terminus will reduce the enzyme's energy yield. This is hypothesized based on previous

studies of the importance of the length of the γ subunit. We aim to evaluate the exact number of amino acid additions the γ subunit can tolerate without causing complete functional disruption. (Faculty Sponsor: Dr. Yunxiang Li)

Supported by Robert A. Welch Foundation, National Science Foundation.

Session 6. Wednesday, April 23, 6:00 pm – 7:20 pm Student Union 2300 (Southwest Ballroom)

1. A COMPARATIVE ANALYSIS OF SONIC HEDGEHOG ACTIVATION AND WNT PATHWAY INHIBITION IN HUMAN COCHLEAR ORGANOIDS. E. Palacios, Z. Lybrand, N. Yasin, M. Gladen. Sciences – Biology

Cochlear organoids are 3D cell culture models designed to recapitulate the human auditory system. During inner ear development, vestibular structures arise dorsally, whereas cochlear structures originate ventrally. Activation of the SHH pathway and inhibition of the WNT pathway promote ventralization, potentially leading to the formation of functional cochlear hair cells. By day 18 of cochlear organoid development, otic placodes—precursors to the inner ear structure—should begin formation, eventually evolving into otic vesicles that contain both hair cells and supporting cells by 60 days. We are investigating which time point during placode formation exhibits the highest expression of PAX8, a key marker of posterior otic placodes. This is crucial for optimizing differentiation protocols. To validate the PUR + IWP2 protocol, we will compare treated organoids to controls. Assessments include gross morphology and marker expression. Immunohistochemistry will quantify PAX8, SOX2, and MYO7A to confirm cochlear structure formation. (Faculty Sponsor: Dr. Zane Lybrand)

Supported by TWU Experiential Student Scholars Program and NSF Award 1953448 (PRIME).

2. AXON REGENERATION IN A POLYTRAUMA NERVOUS SYSTEM INJURY MODEL. L. Evans, T. Olaoluwa, D. Averitt, D. Hynds. Sciences – Biology

This study is designed to observe how the CNS informs the PNS as a result of polytrauma, which influences sensory processing, pain regulation, and axon regeneration. Polytrauma disrupts multiple bodily systems, often causing chronic neurological complications, such as hyperalgesia and allodynia attributed to disruptions within CNS-PNS communication. Discovering these deformities could refine how we understand trauma-induced pain disorders. Through the analyses of behavioral pain responses, nerve function, and biomarkers in organisms, our goal is to recognize how signals of the CNS regulate recovery in the PNS. GAP-43, a growth protein that is a notable marker of regeneration of the axon, provides understanding of how the CNS effects PNS pain regulation and regeneration. We expect to find significant changes in GAP-43 expression assessed through immunohistochemical analysis of the spinal cord dorsal horn ipsilateral to a peripheral nerve injury that we will associate with modified pain responses to demonstrate CNS involvement in PNS recovery. (Faculty Sponsor: Dr. Dianna Hynds)

3. CARE CART PROGRAM. M. Hooks, E. Schwertner. Human Sciences

It's hard to be successful in school when you are worried about your basic needs. Using Maslow's Theory, our Care Cart Program will provide the students in need with food, hygiene products, and laundry services, to help them on their road to success. Our key objectives will consist of the cart providing students with many necessities, including hygiene products, meals, and laundry services. Students and their parents/guardians will need to attend monthly meetings in order to receive laundry vouchers. Also, we will work with a local laundromat to provide laundry services. We hope to serve low-income families, whose students are on free or reduced lunch, as well as foster youth, who aren't always guaranteed hygiene products. With this program in place, students will be helped with their physical well- being which will then benefit their overall well-being. (Faculty Sponsor: Dr. Emily Morehead)

4. CHARACTERIZING PROXIMATE COMPOSITIONS AND FLAVOR PROFILES OF NEWLY DEVELOPED SORGHUM GRAINS. S. Lama, X. Du, Y. Jiao, M. Yerka. Nutrition and Food Sciences - Denton

Sorghum, a versatile cereal grain, contributes to global food security, yet there is limited research on its nutritional and flavor properties for the newly bred sorghum varieties. This study aimed to analyze the proximate compositions using AOAC methods, sugars quantification using HPLC-UV, and volatile profiles by SPME-GC-MS of 18 sorghum varieties. The results showed moisture (8.29 -10.15%), ash (0.63 - 1.89%), lipid (1.89 - 5.68%), protein (7.91 - 10.63%), and dietary fiber (5.80 - 10.58%),. Sugar analysis resulted in glucose (23.75 - 27.72 g/L), fructose (23.35 - 42.97 g/L), sucrose (0.61 - 45.62 g/L), galactose (9.86 - 22.90 g/L), and maltose (46.52 - 70.56 g/L). Volatile analysis indicated specific alcohols (1- pentanol, 1-octen-3-ol, 3-methylbutanol), ketones (2-heptanone, ethyl butyl ketone, 2-heptanone, 6-methyl-2-octanone), aldehydes (hexanal), and furans (3-methylfuran). Results revealed significant variability among the sorghum varieties, offering insights for breeding programs, food innovation, and industrial application. Keywords: Proximate, Gluten-free, Protein, Dietary fiber, Sugar (Faculty Sponsor: Dr. Xiaofen Du)

Supported by TWU REP.

5. ELUCIDATING THE PATHWAY OF BATF3 ACTIVATION IN T CELLS. S. Davis, M. Park, S. Sinha. Sciences – Biology

Basic Leucine Zipper ATF-Like Transcription Factor 3 (BATF3) belongs to the AP-1 transcription factor family. In the murine model, BATF3 contributed to memory CD8 T cell formation and robust recall response induction. Although BATF3 was

discovered in human T cells, there's limited research on BATF3's mechanistic role in healthy human donor cells. We found that BATF3 is upregulated in activated T cells. Building on this, we inhibited functional pathways in T cells to elucidate the signaling pathway leading to the upregulation of BATF3 in T cells. Using various inhibitors to block essential pathways in T cell proliferation and survival, we discovered that blocking the MAPK pathway significantly suppressed BATF3 upregulation in CD8 and CD4 T cells. This suggests BATF3 has a role in proliferation, differentiation, and cytokine production, established functions of the MAPK pathway in T cells. Future studies will investigate BATF3's role in regulating MAPK-mediated functions in T cells. (Faculty Sponsor: Dr. Sushmita Sinha)

Supported by NSF Award 1953448 (PRIME) and NIH 1R15AI16940.

6. EXPLORING RISK FACTORS FOR EATING DISORDERS IN ADOLESCENTS: A LITERATURE REVIEW. L. Maldonado Bravo. Social Work, Psychology, and Philosophy

Adolescents are particularly vulnerable to developing eating disorders due to the variety of increasing risk factors they face. For our Social Research course project, we will examine quantitative studies that explore the risk factors linked to eating disorders in adolescents aged 13 to 18. In our literature review, we focused on both common and often overlooked risk factors in adolescents' daily lives. These factors include eating habits, dietary patterns, and online interactions. Our study will highlight the risk factors currently influencing adolescents and their connection to the development of eating disorders. (Faculty Sponsor: Dr. Shamsun Nahar)

7. HOW ONLINE LEARNING DURING COVID-19 INFLUENCES THE LEARNING STYLES OF COLLEGE STUDENTS. R. Philipo. Social Work, Psychology, and Philosophy

The COVID-19 pandemic led to a significant shift toward online learning, a method that continues to shape educational practices even after the pandemic. To better prepare for future disruptions, it is crucial to understand how online learning has impacted students' learning styles. This study will be conducted as part of a student research study, examining college students' self-reported perceptions of how their learning styles have changed due to online learning. Data collection involves a mixed- methods approach, using quantitative Likert scale surveys to measure levels of agreement and qualitative short open-ended responses to capture deeper insights. Findings from this study aim to provide insights for educational institutions to adapt teaching strategies, ultimately enhancing student comprehension and academic success. (Faculty Sponsor: Dr. Shamsun Nahar)

8. IMPROVING QUALITY OF EDUCATION FOR EXCEPTIONAL STUDENTS WITH QUALITY ADAPTIVE DEVICES, FAMILY SUPPORT, AND INTENTIONAL PHYSICAL ENVIRONMENTS. A. Stigers, J. Armijo, Z. Stankovic-Ramirez. Human Sciences

In this session, we will explore how to create high-quality physical environments in special needs classrooms for students in 4th through 8th grade. The focus of our presentation will center around three adaptive devices currently being utilized in special education classrooms. We will focus on adaptive devices that benefit students and explore the challenges that some of those devices pose in daily and practical use. Family support and practical techniques will be shared in the session to help improve the utilization of adaptive devices. By creating intentional physical environments that meet the needs of each student in the special education classroom, the teachers are taking the first step in improving oral quality care and education. Through administrative support in the form of budget and prompt delivery to classrooms, teachers and students can familiarize themselves with adaptive devices and utilize them daily to enhance learning. Additionally, an important factor is family engagement and involvement. The suggestion shared in this session will bridge home and school and ensure a holistic approach to supporting the teacher, the family, and every unique student. (Faculty Sponsor: Dr. Zlata Stankovic Ramirez)

Supported by Pioneering Discovery.

9. LITERATURE REVIEW: BEST PRACTICES USED IN TEACHING LITERACY SKILLS TO SCHOOL-AGE CHILDREN WITH DOWN SYNDROME. K. Ritchie. Communication Sciences and Oral Health

This study examined best practices for teaching literacy to school-age children with Down syndrome (DS), focusing on their unique strengths and challenges. Through a literature review, it examined the impact of home literacy environments (HLEs), structured interventions, and technology- assisted approaches. The research focused on identifying evidence-based strategies that support literacy development for academic success and functional independence. Findings emphasized the role of enriched HLEs, parental involvement, and print-rich resources. Structured interventions, particularly those targeting phonics and phonological awareness, were effective when tailored to individual needs. Technology-assisted tools, such as Tangible User Interface Systems (TUIS) and augmentative and alternative communication (AAC) devices, enhanced engagement and outcomes. However, consistent practice and professional support remained essential. This research highlighted the need for an integrated approach across home, school, and technology to maximize literacy gains. Future studies should explore innovative interventions and their long-term impact on individuals with DS. (Faculty Sponsor: Dr. Kimberly Mory)

10. MTORC1 PATHWAYS AND DNA METHYLATION IN AUTISM SPECTRUM DISORDERS. M. Speight, D. Hynds. Sciences – Biology

Autism Spectrum Disorders (ASD) constitute a complex

neurodevelopmental condition with diverse genetic and environmental influences. Early and accurate detection remains a challenge due to the heterogeneous nature of ASD. Dysregulation of synaptic plasticity (e.g., decreased axon arbors and dendritic spines) occurs in ASD, where signaling through the mechanistic target of rapamycin (mTOR) is implicated. To determine whether the mTORC1 pathway is decreased and the mTORC2 pathway is increased in neuroblastoma cells and cultured primary neurons leading to changes in ASG gene methylation and transcription is the goal. We will investigate the phosphorylation and activation of downstream effectors by western blotting and correlate this with methylation of key ASD-related genes. Should our hypothesis be supported, we'll pursue additional studies in ASD mice. Insights gleaned from our experiments will be used to develop a biomarker- based screening tool for early detection of ASD and may provide therapeutic targets for intervention. (Faculty Sponsor: Dr. Dianna Hynds)

11. NEURODIVERGENT BEHAVIORS: A PROGRAM FOR MANAGING BEHAVIORS OF CHILDREN WITH AUTISM. S. Horton, L. Ninesling, J. Ipina, K. Jasmin. Human Sciences

Our program addresses the parental educational topic of managing behaviors in special needs children. This is important because it will provide parents and teachers with the necessary needs to cultivate children with autism. Aimed at parents and teachers with special needs children. This demographic encompasses individuals from diverse socio-economic backgrounds sharing a common goal of providing an environment where children can learn by processing their emotions. The program will have three objectives: to improve understanding by helping parents gain knowledge about neurodivergent traits that affect their child's behavior, provide effective management tools for managing challenging behaviors while fostering growth and independence, and, provide parent support and self-care where parents will be equipped with tools for managing their stress, emotions, and support. Topics that will be discussed are improving understanding of autism, effective behavior management, enhancing parent-child relationship, home resources, and lastly parent support and self-care. (Faculty Sponsor: Dr. Emily Morehead)

12. PEST QUEST: MAPPING HYPERA POSTICA ACROSS TEXAS. B. **Flewellen**. Sciences – Biology

Hypera postica, an invasive pest that damages alfalfa crops, was accidentally introduced to the U.S. from Eurasia through human transportation. This study aimed to identify its distribution across Texas using research-grade data from iNaturalist, a platform where users share and verify biodiversity observations. The data spanned from 2015 to 2024. The highest number of observations occurred in Tarrant County (76), followed by Travis (37) and Denton (33). Other counties had substantially fewer reports. The pest is temperature-sensitive, thriving in temperatures between 45-85°F, and remains inactive outside this range. As climate change alters regional conditions, it is likely that Hypera postica may move toward cooler areas in northern and central Texas, where its optimal climate persists. Additionally, human transportation may continually facilitate its spread. These findings suggest that geographic and urbanization factors may influence its distribution, understanding these dynamics is crucial for developing effective management strategies to protect local agriculture. (Faculty Sponsor: Dr. Ann Marie Davis)

13. REPRESENTATION THROUGH READING. O. Olaosun, J. Contreras, K. Rangel, A. Davis. Human Sciences

Representation through Reading is a critical component of early childhood education as it directly influences the development of inclusivity and a sense of belonging among children, particularly those from LGBTQIA+ families. By providing children with access to diverse literature that reflects their family structures, this program addresses the early intervention of discrimination, fostering environments that champion respect, acceptance, and equality. In doing so, we aim to reduce both the short-term and long-term impacts of bullying and exclusion while promoting an inclusive environment that celebrates the diversity of all family types. This initiative is essential for shaping equitable communities and nurturing the well-being of children in early childhood education and preschool programs. Our project objectives include encouraging inclusivity in early education, lessening bullying and promoting acceptance, and encouraging teachers and families to advocate for diversity. (Faculty Sponsor: Dr. Emily Morehead)

14. SUSTAINABLE REMOVAL OF METHYLENE BLUE DYE FROM WATER USING EGGSHELLS. A. Jordan, G. Salazar. Sciences – Chemistry and Biochemistry

Methylene blue is one of the most prevalent used dyes in the textile industry, primarily for dyeing fabrics, paper, and leather. After use, these dyes are often improperly disposed, posing serious environmental risks. Methylene blue is known to be toxic to aquatic life, flora, and humans; thus, there is a need for effective green chemistry dye removal options. A promising approach involves the usage of the absorbent properties of calcium carbonate found in eggshells. In 2018, over 8.58 million metric tons of eggshells were discarded in landfills, presenting a cost efficient opportunity to repurpose this agricultural waste. This is being studied through prolonged absorption experiments, UV/Vis spectroscopic analysis, and imaging techniques, combined with statistical kinetics, to assess the effectiveness of eggshells in removing harmful dyes like methylene blue from wastewater. (Faculty Sponsor: Dr. Gustavo Salazar)

15. THE DISCONNECT BETWEEN THE AMERICAN DREAM IDEOLOGY AND THE EVOLVING WORK CULTURE OF YOUNGER GENERATIONS: A STUDY OF CHANGING VALUES, ECONOMIC REALITIES, AND CAREER EXPECTATIONS. K. Gauldin, N/A. Literacy and Language

The concept of the American Dream has long been associated with the belief in upward social mobility and the idea that hard work can lead to success. However, this traditional ideology is increasingly viewed as outdated, often disconnected from the realities of modern economic challenges. This research examines how younger workers are rethinking key aspects of the American Dream, including job security, financial stability, and personal fulfillment, alongside issues such as work-life balance, career goals, and definitions of success. Through open-ended surveys, interviews, and an analysis of current demographic trends, this study aims to offer a deeper understanding of how changing work dynamics are reshaping the American Dream. The findings will contribute to discussions around organizational policies, economic inequality, labor market reforms, and strategies to reduce burnout, ultimately guiding organizations in adapting to the needs and values of the new workforce. (Faculty Sponsor: Dr. Aimee Myers)

Supported by McNair.

16. TIRZEPATIDE FOR OBESITY AND DIABETES PREVENTION: A LITERATURE REVIEW OF THE SURMOUNT-1 TRIAL. J. Vo, A. Jastreboff, C. le Roux, A. Stefanski, L. Aronne, B. Halpern, S. Wharton, J. Wilding, L. Perreault, S. Zhang, R. Battula, M. Bunck, N. Ahmad, I. Jouravskaya. Sciences – Chemistry and Biochemistry

This literature review of a study by Jastreboff et al. (2024), published in The New England Journal of Medicine, investigating the long-term safety and effectiveness of tirzepatide, a dual agonist of the glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP) receptors, as treatment of obesity and the prevention of diabetes. Obesity, a major risk factor for type 2 diabetes, frequently fail to produce long- term weight loss and glycemic control through lifestyle changes alone. The SURMOUNT-1 experiment is a phase 3, double-blind, randomized, placebo- controlled study. For 176 weeks, 1,032 participants with obesity and prediabetes randomly receive weekly subcutaneous injections of tirzepatide (5 mg, 10 mg, or 15 mg) or a placebo. Results showed significant weight reductions across tirzepatide doses, compared to placebo. Diabetes incidence was lower with tirzepatide. Despite partial weight regain post- treatment, glycemic benefits persisted. These findings support tirzepatide as an effective long-term option for obesity and diabetes prevention. (Jastreboff et al., 2024). (Faculty Sponsor: Dr. Manal Omary)

17. UNHEARD AND MISDIAGNOSED: THE IMPACT OF PATHOLOGICAL STEREOTYPES AND NONVERBAL CUES. T. Choyce. Social Work, Psychology, and Philosophy

Differences in cultural backgrounds between clinicians and patients can impact psychiatric diagnoses, treatment decisions, and overall patient experiences. This literature review examines the role of implicit biases, nonverbal communication, and cultural competence on diagnostic disparities, particularly regarding Black women. Research shows that over 33% of psychiatric patients experience misdiagnoses and overdiagnoses (Faber et al., 2023). They also found Black individuals with depression are often misdiagnosed with schizophrenia, while Gara et al. (2019) highlighted clinicians' tendency to overlook signs of depression in African Americans. Misinterpretations of nonverbal cues, such as assertiveness being seen as aggression, further complicate diagnoses. Pollock et al. (2022) found that 166 white graduate students, despite advanced diversity training, exhibited significant implicit biases, which were reflected in discrepancies between self-assessments and patient evaluations. However, increased exposure to diverse backgrounds may improve patient experiences. This review aims to understand these complexities and foster discussions on improving diagnostic accuracy. (Faculty Sponsor: Dr. Alannah Shelby Rivers)

18. UNDERSTANDING AUTISM: A GUIDE FOR PARENTS. A. Ortega. Honors Program

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by challenges in social communication and repetitive behaviors. It is critical to access timely interventions that improve communication, social and adaptive skills which is particularly done before the age of three. This presentation highlights key early signs of autism, such as limited eye contact, delayed speech and repetitive behaviors. It also outlines steps for parents and caregivers including consulting pediatricians and accessing services. Additionally, it discusses effective support strategies such as creating structured routines, using visual communication aids, and fostering social interactions. A special focus is placed on improving resources for Spanish-speaking families to enhance accessibility and familiarity with the topic. By raising awareness of early detection and intervention resources, this presentation aims to empower diverse communities and promote improved developmental outcomes for children with ASD. (Faculty Sponsor: Dr. Alfred Litton)

19. THE EXPERIENCES OF FIRST RESPONDERS WHEN CHILDREN ARE IN THE SCENE. L. Bates, J. Garcia, L. Murphy, K. Cantrell. Human Sciences

Our research team is conducting an anonymous survey of first responders to understand their experiences when children and adolescents are involved in their emergency calls. If the participants choose to enter, we will be drawing random responses for a few gift cards as compensation. This research is supported, in part, by the Jane Nelson Institute for Women's Leadership and the Texas Woman's University Quality Enhancement Plan. We ask in the survey about the first responders' mental health, emotional responses, their roles on the scene, who works with the children, as well as what behaviors and emotions they see the children express during emergencies. We hope to use this information along with other research to build programs that will help train first responders in typical trauma responses in childhood and child

development in the future. (Faculty Sponsor: Dr. Kathryn Cantrell)

Supported by TWU Jane Nelson Institute for Women's Leadership.

20. TEEN PATH: A PARENTING EDUCATION PROGRAM FOR TEEN PARENTS. A. Zuniga, B. Garcia, L. Jackson. Human Sciences

Teen parents face unique challenges in raising their children while navigating their personal growth and development. Our program addresses the issue of "Supporting Teen Parents in Education and Parenting," recognizing the dual responsibilities of balancing education and effective parenting. The importance of this issue is underscored by the need to help teen parents with the tools, resources, and knowledge necessary to balance their roles and thrive as both students and parents. The program will be structured to navigating the balance between parenthood an education, building positive parent-child relationships, financial literacy and resources for teen parents, mental health and self-care for teen parents, and accessing community support and resources. (Faculty Sponsor: Dr. Emily Morehead)

21. STUDIES OF HOW STRESS CELLS SIGNAL OTHER CELLS TO PROTECT THEIR DNA. M. Trujillo, L. Hanson. Sciences – Biology

When cells are exposed to potential dangers, they can compact their chromatin/ DNA as a defense. In studies aimed to see if cells would compact their DNA in response to viruses, we unexpectedly found that something released by stressed cells causes other cells to compact their chromatin. We are aiming to identify the mechanism of this chromatin response. Using SGC1 epithelial-like cells and J774 macrophages, we put cells at high fever temperatures and collected supernatant to serve as conditioned media from stress cells. Other cells were exposed to conditioned media or normal media, fixed and stained with Hoechst which stains DNA. Imaging was done to analyze the staining intensity, brighter staining shows higher DNA compaction. Compaction is detectable for at least 4 hours if conditioned media is present but reversed if it was removed. This study could lead to improvement of sunscreen or in therapeutics to help protect DNA. (Faculty Sponsor: Dr. Laura Hanson)

22. PLANTS GROWN AT REDUCED PRESSURES FOR EXTRATERRESTRIAL ENVIRONMENTS. C. Bateman, J. Beatty. Sciences – Chemistry and Biochemistry

Cultivating crops in extraterrestrial environments requires adaptable agricultural practices and optimization of atmospheric conditions under reduced pressure. Hydroponics, a promising soilless technique, enables off-planet farming where lunar and Martian soils are unsuitable. Spinach, with its rapid and well-documented growth cycle, serves as an ideal candidate to assess hydroponic growth under partial pressure. This study aims to examine whether spinach can germinate and grow to the harvesting stage under low pressure while maintaining nutritional content and yield. As a preliminary step, a modified growth chamber with a vacuum pump created a reduced-pressure environment (9–10 psi) to test germination viability. Seeds were planted in two hydroponic growth mediums and successfully germinated, with a control group verifying seed viability under normal atmospheric conditions. With germination confirmed, the next step involves constructing a full-sized pressure chamber for deep water hydroponic growth to the harvest stage. These findings advance the potential for extraterrestrial crop cultivation. (Faculty Sponsor: Dr. John Beatty)

Supported by Robert A. Welch Foundation, TWU Center for Student Research, and NSF Award 1953448 (PRIME).

23. PARENTING IN THE NICU. A. Allen, T. Andrews. Human Sciences

Our program addresses the issue of "Parenting in the NICU", where families face challenges that can bring emotional experiences when parenting a child that is in the Neonatal Intensive Care Unit. By the end of the program, parents will be able to develop coping strategies, while having ways to better maintain their own physical and mental health while caring for the infant in the NICU. Additionally, nurses and healthcare providers will be able to provide better recommendations such as support groups, emotional and physiological care, effective communication to help parents feel more involved with caring for their child in the NICU, and post-nicu counseling for parents in order to ease some of their burden. Lastly, Family-Centered Care in the NICU will be more established and better approached in order to prioritize the well-being of both parents to foster healthy relationships and the developmental care and emotional care of their infant. (Faculty Sponsor: Dr. Emily Morehead)

24. MUSICA PARA APRENDER: A PROGRAM FOR ENHANCING LANGUAGE DEVELOPMENT THROUGH BILINGUAL NURSERY RHYMES AND MUSIC. E. Tovar-Diaz, V. Corral, A. Alba, J. Ramirez. Human Sciences

Musica para Aprender is an innovative program designed to enhance bilingual language development in young children through nursery rhymes and music. With Spanish being the most spoken language at home among English learners (76.4%), our program ensures children strengthen their English skills while retaining their native language. Through rhythmic patterns, repetition, and melodies, we promote language acquisition, pronunciation, and comprehension in an engaging and memorable way. This five-month program consists of interactive workshops for children (ages 2-6) and their caregivers, providing a supportive bilingual learning environment. Sessions focus on key developmental themes self-regulation, behavior consequences, hygiene, resilience, and following directions using culturally relevant songs like El Patito Juan and La Araña Pequeñita. By fostering bilingualism through music, Musica para Aprender empowers parents,

educators, and young learners to embrace language development as a joyful and enriching experience, bridging cultures and enhancing communication skills for lifelong success. (Faculty Sponsor: Dr. Emily Morehead)

25. MODELING NEURODEGENERATIVE DISEASES THROUH VARIOUS DIFFERENTIAL EQUATIONS. L. Orozco, M. Kinney, M. Schwickert, A. White. Sciences – Mathematics

Several studies have been conducted on Alzheimer's Disease (AD) exploring the dynamics of tau proteins and amyloid plaques. These studies on the progression and severity of AD have presented comprehensive models of tau and beta-amyloid physiological roles. In this poster, we will discuss differential equations detailing the beta amyloid peptide kinetics model and the tau protein kinetics model, with an emphasis on the beta-amyloid peptide kinetics model. These models show great promise in the future of understanding AD. Using this research, as well as a fundamental understanding of calculus, we will break down these models to show how various differential equations are used to explore neurodegenerative disease. (Faculty Sponsor: Dr. Junalyn NavarraMadsen)

26. INFLAMMATION AND OXIDATIVE STRESS DAMAGE CONTRIBUTE TO PAIN IN A PRECLINICAL MODEL OF BURN INJURY. G. Perez Posada, T. Olaoluwa, D. Averitt. Sciences – Biology

To develop novel therapeutics for full-thickness burn injuries, understanding burn pain mechanisms is crucial. Male and female rats received a sham (no heat) or full-thickness burn injury on the right hind paw using a soldering iron at 100℃ for 30 seconds. After 72 hours, blood plasma and dorsal root ganglia (L2-L5) were analyzed for oxidative stress and inflammatory markers. We hypothesized that burn injury induces significant changes in these mediators, contributing to pain sensitivity. Cytokine arrays were used to quantify inflammatory mediators, while oxidative stress was assessed via Reactive Oxygen Species and Advanced Oxidized Protein Products assays. Our findings show that burn-injured rats exhibited a significant increase in key inflammatory markers and oxidative damage, suggesting these factors drive burn pain sensitivity. Identifying these changes may help target specific pathways to reduce burn-induced pain and improve treatment strategies. (Faculty Sponsor: Dr. Dayna Averitt)

Supported by NSF Award 1953448 (PRIME) and TWU REP.

27. ILLUMINATE1. S. Patel, K. Castro, R. Dasgupta, C. Brower. Sciences – Biology

Protein arginylation is critical for the removal of damaged proteins and has significant implications for human disease. This process is catalyzed by the enzyme Arginyltransferase 1 (ATE1). The loss of ATE1 in mice was shown to cause defects in fat metabolism as well as neurodegeneration. However, in these studies ATE1 loss occurred in all tissues throughout the body. The loss of ATE1 across all of the tissues in the body has left the specified tissue roles unclear. We have observed differences in ATE1 activity between tissues with similar ATE1 protein levels. This predicts the existence of tissue- or cell type-specific regulators of arginylation. To survey the spatial and temporal regulation of ATE1 in a comprehensive manner, we recently generated transgenic ATE1-reporter mice which express a dual-fluorescent reporter sensitive to its activity. Currently, we are confirming the inheritance of the reporter through genotyping and characterizing transgenic mice. (Faculty Sponsor: Dr. Christopher Brower)

Supported by NSF Award 1953448 (PRIME),TWU Center for Student Research, TWU REP, Elma Gonzalez Summer Internship, and National Institutes of Health (NIH).

28. HOW LITHIUM INHIBITS HERPES. C. Hopkins, K. Marvin, M. Trujillo, L. Hanson. Sciences – Biology

Lithium (Li) has been approved to treat some conditions, like bipolar disorder, since the 1970s. In the 1980s, a few studies found that lithium chloride (LiCl) could inhibit some herpes viruses, but no mechanism was determined. Our lab showed that LiCl can also inhibit a different herpesvirus, cytomegalovirus. This study aims to explore mechanisms of lithium chloride inhibition of murine cytomegalovirus (MCMV). Using permissive cell-lines, we are testing if the effect is on viral or cellular factors. When LiCl is present throughout the infection, there is a reduction in specific viral proteins, but not others. Pre-treating cells with LiCl before viral infection only, also led to a clear reduction in a few viral proteins. These findings support that LiCl is likely acting through some important cellular factors, rather than directly on the virus. Identification of the mechanisms could lead both to a better understanding of herpes viruses, and possible new treatments. (Faculty Sponsor: Dr. Laura Hanson)

Supported by the TWU Quality Enhancement Plan.

29. EMPOWERING YOUR CHILD: SELF ADVOCACY FOR MEDICAL NEEDS. C. Hutchinson, E. Collier. Human Sciences

Our program recognizes the difficulty parents and children face when returning home from medical stays. Based on developmental knowledge, this workshop will guide parents of children ages 7-11 in conversations about navigating new or negative feelings regarding their medical differences, as well as advocating for their needs. By the end of the program, parents will be able to use strategies to help their child build skills in self- advocacy and confidence in their diagnosis, find community with other parents, and recognize a positive adjustment in how their child speaks to peers and other adults about their medical needs. Administered by a child life specialist in a hospital setting, this workshop will educate parents on child development in middle childhood, self-advocacy, resource seeking, empowering language, and navigating challenging conversations. (Faculty Sponsor: Dr. Emily Morehead)

30. EFFECT OF GONADAL HORMONES ON P2X PURINERGIC

RECEPTOR 3 (P2RX3) EXPRESSION IN THE RAT TRIGEMINAL GANGLIA. A. Mendoza, B. Islam. Sciences – Biology

Orofacial pain disorders are 2-4x more prevalent in women. Studies report that gonadal hormones like estrogen can regulate pain-generating ion channels, including transient receptor potential vanilloid 1 (TRPV1) and P2X purinoceptor 3 (P2RX3) on sensory neurons. We recently reported that P2rx3 gene expression is significantly higher in female rats. P2rx3 gene encodes P2RX3 protein, a ligand-gated ion channel activated by ATP that leads to an influx of cations to trigger pain signaling. Previous studies reported that estrogen downregulates P2RX3. We hypothesize that the P2RX3 expression is sexually dimorphic and fluctuates with the estrous cycle. To test this hypothesis, we extracted trigeminal ganglia from rats during each stage of the estrous cycle, ovariectomized females, and males. Tissues were fixed in paraformaldehyde, sectioned onto glass slides, and processed by fluorescence immunohistochemistry. Our data indicate that P2RX3 is highly expressed in the TRPV1 population of sensory neurons in female rats during estrus. (Faculty Sponsor: Dr. Dayna Averitt)

31. CATALYTIC ROLE OF THE H-LOOP IN HUMAN GLUTATHIONE SYNTHETASE. M. Marks, M. Anderson. Sciences – Chemistry and Biochemistry

Human glutathione synthetase (hGS) is a crucial enzyme in the glutathione biosynthesis pathway, catalyzing the ATP-dependent ligation of γ- glutamylcysteine and glycine to form glutathione. The enzyme's structural dynamics play a key role in its function, particularly the H-loop, a flexible region implicated in substrate binding and catalysis. This study investigates the conformational behavior of the H-loop using DSC, ITC, UV- Vis, and site-directed mutagenesis to assess its role in enzymatic activity. Structural analysis suggests that the H-loop undergoes significant conformational changes during the catalytic cycle, facilitating substrate positioning and product release. Mutational studies may reveal that specific residues within the H-loop contribute to ATP hydrolysis efficiency and substrate affinity, highlighting their importance in enzymatic regulation. Understanding the H-loop's role provides insight into the molecular basis of glutathione synthesis and may aid in the development of therapeutic strategies for glutathione synthetase deficiency and oxidative stress-related diseases. (Faculty Sponsor: Dr. Mary Anderson)

Supported by Welch Foundation Grant (Chemistry and Biochemistry Division TWU).

32. BRIDGING THE GAP: HOW PARENTS CAN SUPPORT THEIR CHILD'S DEVELOPMENT IN THE HOSPITAL. S. Crain, K. Filipp, J. Clark. Human Sciences

Our online click-and-learn program will focus on the parenting issue of children's development in the hospital. This topic is important because children often miss school as a result of being hospitalized. Our program is essential for parents to learn how to support their children's development during this difficult time in their childhood. After our program, parents can provide a comfortable environment for their child in the hospital, be able to prevent learning gaps in their children by providing educational support, and parents will know how to contribute to helping their children with their overall development. Our target audience consists of parents whose children are facing long-term hospital stays during early childhood (ages 1-10). This demographic includes caregivers from diverse cultural or socioeconomic backgrounds who aim to support their children's overall growth and development during their hospital stay. (Faculty Sponsor: Dr. Emily Morehead)

33. AN EXPLORATION OF COVID- 19 AS INSPIRATION FOR NEW PRACTICES IN SELF-PRIORITIZATION AMONG WORKING MOTHERS. E. Loffler, L. Rosen, E. Edwards. Social Work, Psychology, and Philosophy

Working mothers often experience an imbalance between career, parenting, and the "second shift" disproportionate burden of under-acknowledged household and caregiving duties (Brailey & Slatton, 2019). The COVID-19 pandemic exacerbated this imbalance by eliminating many outsourcing options, increasing maternal stress and mental health challenges (Penna et al., 2023). This study examines the pandemic's impact on working mothers, focusing on resilience, adjustment, and role overload. We hypothesize that lower resilience correlates with increased feelings of emptiness and that lower adjustment correlates with greater parenting role overload. Additionally, we explore self-reported actions mothers took to prioritize themselves. A sample of 186 women (ages 22–64, M = 38.33) completed surveys assessing work-life integration, life satisfaction, and role overload. Thematic analysis of open-ended responses will identify priority shifts. Findings may inform interventions to enhance maternal resilience and support equitab (Faculty Sponsor: Dr. Lisa Rosen)

Supported by TWU Jane Nelson Institute for Women's Leadership.

ABSTRACTS FOR VIRTUAL PRESENTATIONS

Abstracts are listed in the department of the faculty sponsor.

Session 1. Tuesday, April 22, 9:00 am – 10:20 am
Zoom Link

1. THE CONSTRUCTION OF CREDIBILITY AND EXPERTISE: BLACK TEACHERS OF CLASSICAL BALLET. M. Stephenson. Arts and Design – Dance

The Construction of Credibility and Expertise: Black Teachers of Classical Ballet is a qualitative, case study conducted at five professional ballet schools in America to investigate the lived experiences of well-established Black ballet teachers and the viewpoints of their students and parents who are an essential part of the constituency determining the instructor's credibility in instructing the art form. My central research question is: What impact, if any, does the racial background of teachers have on their perceived credibility in teaching classical ballet? This presentation will share the research methodology and initial emergent themes from the data analysis. The findings are from both observing and interviewing Black ballet instructors and from focus group interviews with parents and students to uncover their viewpoints on the qualities they consider when associating credibility to an instructor. (Faculty Sponsor: Dr. Adesola Akinleye)

Supported by TWU Jane Nelson Institute for Women's Leadership and the TWU Quality Enhancement Plan.

2. ECHOES OF SILENCE: FEMINICIDIOS AND THE CINEMATIC RESISTANCE IN NATALIA BERISTÁIN'S RUIDO. J. Vital. Language, Culture, and Gender Studies

This presentation examines Ruido (2022), directed by Natalia Beristáin, as a powerful cinematic intervention that exposes the ongoing crisis of gender violence in México, specifically feminicidios. Through the journey of a mother searching for her missing daughter, Ruido unveils the structural impunity and collective suffering that define the lived experiences of countless women and families. Beristáin's film transforms the cinematic space into a site of resistance, where personal grief intersects with political urgency. By analyzing the film's visual and narrative strategies, I explore how Ruido amplifies the voices of the victims and challenges the normalization of violence against women in México. This presentation seeks to contribute to a broader discussion on cinema's role in shaping collective memory and mobilizing social change. (Faculty Sponsor: Dr. Angela Mooney)

3. THE IMPACT OF NURSE CASE MANAGERS ON PATIENT SATISFACTION SCORES. A. Pandya, A. Garcia, G. Anderson-Harty, S. Shaji. Health Care Administration

Patient satisfaction is an important indicator of healthcare quality. The role of nurse case managers in coordinating care, improving patient outcomes, and addressing barriers to treatment may influence overall patient satisfaction. This systematic review aims to assess whether the presence of nurse case managers in healthcare delivery has a measurable impact on patient satisfaction scores. Seven databases and the grey literature were searched with replication by 2 or more researchers to ensure thoroughness and fidelity. Search was limited to publication during the past 10 years (2014-2024) in English. Search terms included nurse case manager, nurse navigator, and patient satisfaction. Studies were excluded when they did not utilize case management and licensed registered nurses. The initial search produced 378 articles, which resulted in 88 relevant articles. Study protocols included the Cochrane Handbook for Systematic Reviews of Interventions (2nd ed.) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). (Faculty Sponsor: Dr. Sandra Tyson)

4. UNDERSTANDING REHABILITIATION PROVIDER AVAILABILITY IN THE STATE OF TEXAS. M. Ratoza, R. Patel, W. Brewer, K. Mitchell, J. Chevan. Physical Therapy - Houston

While models exist for evaluating healthcare access in primary care, dentistry, and mental health, none assess rehabilitation. This study examines the population-to-provider ratio for physical and occupational therapists across Texas at the census tract level. Using data from the Texas Physical Therapy Examiners Mailing List and 2020 Census, the residential addresses of 28,613 PTs and 16,501 OTs were analyzed using ArcGIS. Spatial joins assigned providers to census tracts, and population- to-provider ratios were calculated. Choropleth and bivariate maps visualized access disparities. A Chi-Square analysis examined demographic differences between areas of high and low provider availability. Choropleth maps illustrated geographic disparities, particularly in urban areas. Chi- Square results found significant differences and moderate effect sizes for race and ethnicity between census tracts of high and low availability. Findings highlight inequities in rehabilitation access, informing targeted outreach and policy advocacy to improve rehabilitation services in underserved communities. (Faculty Sponsor: Dr. Rupal Patel)

Supported by CoHSTAR.

5. USING LEGOS TO INCREASE STUDENT UNDERSTANDING OF STEM. I. Hernandez, S. Mendoza. Sciences – Mathematics

During this presentation, we will discuss the use of LEGOs and other manipulatives to build student understanding of STEM topics in the middle school classroom. Sample problems with student work will be discussed with modifications for classroom use. (Faculty Sponsor: Dr. Ann Wheeler)

6. STROKE ASSESSMENT TRAINING. D. Kogut. Nursing - Dallas

Stroke is a leading cause of death and disability in the U.S. Nurses caring for hospitalized stroke patients perform frequent neurological examinations using the NIHSS. Obtaining certification in performing the NIHSS requires online training videos with no in-person component to apply the learned skill. The intent of this project is to enhance stroke assessment knowledge and skills in new graduate RNs working with stroke patients in a comprehensive stroke center. This project will address the current online-only limitation of current NIHSS training by requiring additional in-person NIHSS education and simulation to bridge the gap between theory and practice and validate participants' skills in performing the NIHSS. To evaluate outcomes of the project, participants will be administered a pre and post survey assessing self-rated competency in performing the NIHSS. (Faculty Sponsor: Dr. Cecilia Wilson)

7. THE IRONY OF AUTHORITY: NARRATIVE POWER AND THE DEFIANCE OF STARS. A. Elliott. Language, Culture, and Gender Studies

Clarice Lispector's The Hour of the Star explores the irony of narrative influence on individual purpose. Rodrigo's insistence on the meaninglessness of Macabea's portrays her as a docile and insignificant individual. But this complex relationship between the narrator and and individual purpose is challenged by the end of the narrative. By examining the final scenes of the narrative as well as the Midas touch reference-- specifically the idea that meaning is self-defined-- Macabea's final moments are instead seen as an act of defiance, rather than passivity and challenges the power the narrator holds in storytelling. (Faculty Sponsor: Dr. Angela Mooney)

8. GENDER AND TRADITION: NAVIGATING WOMANHOOD IN REAL WOMEN HAVE CURVES AND BARBIE. M. Flores, C. Zarate. Language, Culture, and Gender Studies

This presentation explores the challenges of being a woman in traditional Mexican households and the broader societal pressures placed on women, using Real Women Have Curves (2002) and Barbie (2023) as case studies. Real Women Have Curves highlights the struggles of first-generation Mexican-American women navigating family expectations, body image, and independence, while Barbie critiques the unattainable standards and contradictions imposed on women in modern society. By analyzing these films in conversation with each other, this presentation examines the intersections of gender, culture, and resistance, bringing awareness to the complexities of womanhood across different cultural and cinematic narratives (Faculty Sponsor: Dr. Angela Mooney)

Session 2. Tuesday, April 22, 2:40 pm – 4:00 pm

Zoom Link

1. PARALLEL JOURNEYS: THE GREEN CARD PROCESS AND CHILDREN'S ASYLUM IN THE U.S. IN VALERIE LUSELLI'S TELL ME HOW IT ENDS. A. Del Vecchio. Language, Culture, and Gender Studies

In my presentation, I will explore Valeria Luiselli's Tell Me How It Ends and her role as a translator and interpreter for children seeking asylum in the United States. I will focus on the personal stories of these children, emphasizing how small details can impact their chances of receiving legal representation. For instance, a police report found in the pocket of Manu, a 16-year-old boy fleeing gang violence, played a pivotal role in securing legal assistance. Additionally, I will compare the journeys of these children with Luiselli's own experience navigating the complexities of obtaining a green card. This comparison will highlight the vulnerability and challenges faced by undocumented minors as they pursue safety and legal status, showcasing the disparities between the paths to legality for those seeking green cards and children seeking asylum in the U.S. (Faculty Sponsor: Dr. Angela Mooney)

2. DREAMS, SACRIFICES, AND FAMILY BONDS IN "BUENA GENTE" BY ADRIANA GALLARDO AND "A BETTER LIFE" BY CHRIS WEITZ. R. Patino. Language, Culture, and Gender Studies

In my presentation, I will explore the themes of family, sacrifice, and resilience in "Buena Gente" by Adriana Gallardo and the film "A Better Life" by Chris Weitz, both depicting immigrant families striving for the American Dream. In "Buena Gente," the story, told through a daughter's perspective, examines the emotional cost of a father's life of hard work and his search for meaning beyond his career. Similarly, "A Better Life" follows an immigrant father in Los Angeles who sacrifices for his son's future, showcasing the deep love and determination that drive him. Both works highlight obstacles like financial hardship, cultural barriers, and isolation, while also emphasizing the power of community and kindness. This presentation will analyze how these narratives portray intergenerational relationships and the concept of success, showing that the American Dream is more than material wealth, but also about family, dignity, and the hope for a better future. (Faculty Sponsor: Dr. Angela Mooney)

3. MEDICAL INTERPRETER COLLABORATION IN SIMULATION: ENHANCING NURSING STUDENTS' CLINICAL COMPETENCY AND CULTURAL RESPONSIVENESS. E. Pugh, N. Fogg. Nursing - Denton

This study explores the impact of medical interpreter-mediated communication education on final-semester prelicensure nursing students' knowledge, clinical competency, and perceptions of interprofessional

simulation-based education (IPSE). As culturally responsive care becomes increasingly essential in nursing, effective communication with diverse patients, especially those with language barriers, is critical. This study addresses a gap in preparing healthcare professionals for these competencies by implementing a simulation where nursing and medical interpreter students collaborate with a non-English language preference (NELP) patient. Students completed pre/post-evaluations, including the SPICE-R2 Instrument, and their competency application was assessed during the simulation. Preliminary results suggest positive shifts in student perceptions of IPSE following the simulation. The findings aim to enhance IPSE effectiveness, inform future curriculum development, and promote cultural competence in nursing education. Future studies may further integrate structured IPSE programs across all nursing education levels to advance culturally competent care in healthcare settings. (Faculty Sponsor: Dr. Niki Fogg)

Supported by TWU Honors Program.

4. TRAUMA AND IDENTITY IN HUESERA: THE BONE WOMAN AND CARMEN MARIA MACHADO'S HER BODY AND OTHER PARTIES. M. Kemp. Language, Culture, and Gender Studies

This presentation will analyze Huesera: The Bone Woman (2022), a psychological horror film directed by Michelle Garza Cervera, exploring themes of the occult, first-time motherhood, sexuality, and trauma. The protagonist's struggles with bodily transformation and haunting trauma provide a complex view of female identity and the psychological horror genre. In addition, I will compare the film with Carmen Maria Machado's Her Body and Other Parties, focusing on shared themes of female subjectivity, bodily autonomy, and the intersections of trauma and sexuality. By examining these works together, I aim to highlight how both challenge traditional narratives of womanhood and explore the complexities of trauma and identity within feminist horror. (Faculty Sponsor: Dr. Angela Mooney)

5. A MODEL FOR TEACHING SOCIAL DETERMINANTS OF HEALTH IN DOCTOR OF PHYSICAL THERAPY PROGRAMS. E. Bjork, R. Patel, R. Operacz, D. Melvey, L. Garcia III. Physical Therapy - Houston

Purpose: 1) Describe development of a novel educational module on social determinants of health (SDOH) for Doctor of Physical Therapy (DPT) students, and 2) Assess module effectiveness on altering DPT students' knowledge, attitudes, beliefs, and barriers in addressing SDOH. Methods: Current literature, content expert feedback, identity theory, and experiential learning theory, aided development of a two-hour module on SDOH which was delivered at two universities. The Physical Therapy Social Determinants of Health Scale (PT-SDHS) assessed students quantitatively while short answer responses identified qualitative themes. Results: Thirty-one paired samples of PT-SDHS data showed significantly higher total PT SDHS score (Mean Difference = +10.61, SE = 1.72, $t(31)=6.161$, $p<.001$) and Knowledge score (Mean Difference = +11.26, SE=1.36, $t(31)=8.254$, $p<.001$) after participation. Other domains showed non-significant changes. Descriptive themes emphasized needing relevant resources, clinic-oriented practice, and preferred methods of instruction. Conclusion: Development of SDOH curricula can follow this method to generate effective learning activities. (Faculty Sponsor: Dr. Rupal Patel)

Supported by APTA Academy of Leadership and Innovation Research Grant, TWU Center for Student Research.

6. HOW "NOTICE AND WONDER" CAN IMPACT STUDENT LEARNING, CAREER PATHS, AND ANXIETY LEVELS IN STEM FIELDS. D. Colston, R. Rosas. Sciences – Mathematics

This presentation will explore how the "Notice and Wonder" (Rumack & Huinker, 2019) strategy can support middle school students' comprehension of STEM concepts with demonstrations of sample student problems and corresponding work. The impact of this teaching strategy on student career paths and anxiety levels will also be detailed. (Faculty Sponsor: Dr. Ann Wheeler)

7. BEST MANUAL PHYSICAL THERAPY MANAGEMENT PRACTICES AND THEIR DOSAGES FOR CHRONIC NECK PAIN – A NARRATIVE REVIEW. H. Baba, S. Wang-Price. Physical Therapy - Dallas

The clinical practice guidelines for physical therapists (PTs) treating chronic neck pain (CNP) often lack recommendations on treatment dosage, such as frequency and duration. The purpose of this narrative review was to evaluate the best available evidence on manual therapy (MT) and report the treatment dosages. Sixty-nine randomized clinical trials in which MT were administered only by PTs on adults with insidious onset of NP (≥3 months) were included in this review. All studies favoring combination of MT with exercises or multimodal interventions used a dosage of 2x/week for 4-6 weeks. Studies comparing joint mobilization/manipulation to sham or for upper cervical dysfunction predominantly consisted of a single session. Lastly, the dosage used in the studies examining soft tissue mobilization and dry needling was 1-2 sessions/week for 4weeks. In conclusion, MT dosage with most favorable outcomes in CNP was approximately 2x/week for 4 weeks when MT was combined with other treatments. (Faculty Sponsor: Dr. Sharon Wang-Price)

8. USE OF SOCIAL MEDIA TO PROMOTE HEALTH: A NARRATIVE REVIEW. J. Jabbar, R. Delgado. Health Care Administration

With the widespread use of social media in the early 2000s, popular platforms have been considered viable options for health promotion and disease prevention. However, it is important to define what research has been completed to

understand the degree of impact of social media strategies. Evaluating social media's effectiveness in health promotion is important for developing evidence-based strategies, bridging knowledge gaps, guiding future interventions, and optimizing its role in enhancing public health outcomes. We completed a literature search to identify, quantify, and classify studies related to the use of social media in health promotion or information. The search included studies published in English between 2011 and 2023, involving health promotion using different social media platforms which we hope will serve as a first step in identifying future research opportunities. Our results will highlight the type of research done in health promotion, trends over time, focus of the studies. (Faculty Sponsor: Dr. Rigoberto Delgado)

Session 3. Tuesday, April 22, 6:00 pm – 7:20 pm

Zoom Link

1. NARRATING RESISTANCE: IMMIGRATION, IDENTITY, AND POLITICS IN VALERIA LUISELLI'S TELL ME HOW IT ENDS. H. Adams. Language, Culture, and Gender Studies

This symposium will center on Valeria Luiselli's Tell Me How It Ends: An Essay in 40 Questions as a profound example of how women's writing functions as political resistance. Through her examination of child migration and the U.S. immigration system, Luiselli exposes the bureaucratic dehumanization of migrants while amplifying their voices. This event will explore the intersections of literature, politics, and activism, analyzing how storytelling can challenge state power, reshape dominant narratives, and advocate for social justice. (Faculty Sponsor: Dr. Angela Mooney)

2. KEY ROLE OF TEXTURE IN FRESH-CUT VEGETABLES AND CHARACTERIZATION OF TEXTURE-RELATED PARAMETERS IN CUCUMBER. C. Duan, T. Nguyen, J. Tan, Y. Weng, X. Du. Nutrition and Food Sciences - Denton

Texture is a key quality parameter for fresh-cut fruits and vegetables, directly influencing consumer preference for freshness, crispness, and overall eating experience. This study characterizes texture in fresh-cut salad vegetables, focusing on cucumbers. A Texture Analyzer measured overall hardness (N) and six key parameters—hardness, brittleness, cohesiveness, gumminess, springiness, and chewiness—using 20 cucumbers sliced into 10 mm sections. Hardness was assessed across three cucumber tissues: mesocarp, endocarp, and exocarp. Results showed the lowest overall hardness at the blossom end (~12.614 N) and the highest at the stem end (~19.042 N). The endocarp exhibited the lowest hardness, brittleness, gumminess, and chewiness (~3.140 N, 3.315 N, 0.375, 0.242), while the exocarp displayed the highest (~12.724 N, 13.160 N, 1.266, 0.768). Cohesiveness and springiness showed no significant trends. These findings improve the understanding of cucumber texture, contributing to future sensory evaluations, product development, and consumer acceptance studies in the food industry. (Faculty Sponsor: Dr. Xiaofen Du)

Supported by USDA-NIFA and TWU Center for Student Research.

3. USING THE TECHNIQUES OF "NOTICE AND WONDER" TO ENHANCE STEM LEARNING IN THE MIDDLE GRADES. A. LaPoint. Sciences – Mathematics

For this presentation, I plan to discuss the use of the "Notice and Wonder" (Ray-Riek 2013), routine to help middle school students understand STEM topics. This presentation will detail the definition of "Notice and Wonder," as well as the benefits of this teaching strategy, such as increased mathematical understanding. Sample problems will also be explored, as well as modifications for other grades. (Faculty Sponsor: Dr. Ann Wheeler)

4. USING LEGOS TO ENHANCE STEM INSTRUCTION OF MIDDLE SCHOOL STUDENTS. J. Garcia. Sciences – Mathematics

This presentation explores the integration of LEGO-based learning activities to enhance students' understanding of Science, Technology, Engineering, and Mathematics (STEM) concepts. The use of LEGOs in educational settings has gained recognition for its ability to foster creativity, critical thinking, and hands-on problem-solving skills. This study examines how LEGO-based tasks can be employed to help students visualize and interact with STEM concepts, making them more accessible and engaging. This presentation will also discuss the benefits of using tactile learning tools in fostering a deeper understanding of abstract STEM concepts, as well as the ways in which LEGO activities can promote teamwork, communication, and collaboration. The presentation will conclude with an overview of the potential impact on student learning, offering recommendations for educators interested in incorporating LEGO-based activities into their curricula. By emphasizing hands-on, student-centered learning, this presentation aims to encourage educators to explore new ways of engaging students with STEM subjects. (Faculty Sponsor: Dr. Ann Wheeler)

5. UNLOCKING POTENTIAL: STRATEGIES TO EMPOWER STUDENT-LED LEARNING AND DISCUSSION. L. Clegg. Teacher Education

Effective instructional leadership isn't just about identifying problems—it's about taking action, bringing people together, and making real change happen. This project explores how targeted professional learning and a strong collaborative culture can transform teaching and learning. I led a collaborative team in analyzing data, identifying instructional gaps in reading and language and implementing research-based strategies to strengthen Tier I instruction, focusing on student-led learning, active questioning, and discussions. Our professional development plan provided teachers with practical, high-leverage strategies, while a

year-long collaborative learning initiative built a culture of shared growth. Through this process, I experienced firsthand that meaningful growth happens when leadership is intentional, learning is ongoing, and collaboration is prioritized. These findings highlight the power of instructional leadership in shaping school culture and improving student learning outcomes. (Faculty Sponsor: Dr. Amanda Hurlbut)

6. SECONDARY AND HIGHER EDUCATION WORKFORCE SKILL DEVELOPMENT FOR PERSONS WITH IDD. D. Hademenos. Sciences – Mathematics

In a previous work, this author explored employment perspectives of, for, and by individuals living with intellectual or developmental disabilities (IDD) from the perspectives of the individuals themselves, their family, and their employers (Hademenos, 2024). This work expands on this unification across the employment experiences intersecting with IDD to bring in the current state of workforce skill development in high school and higher education programs. The goal of this work is to understand how these programs support persons living with IDD in developing marketable skills for competitive employment, and opportunities for improvement. Subtopics in this work include: differences in work experiences; differences in credential attainments; instructor experience working with IDD learners; problem-solving ability in IDD learners; successful transitioning from school age to independent living and working; and proposed steps forward. (Faculty Sponsor: Dr. Ann Wheeler)

7. GLOBAL WEATHER AND AIR QUALITY DYNAMICS ANALYSIS WITH R: UNDERSTANDING ENVIRONMENTAL INTERACTIONS. Z. Yusufali, P. Kommalapati, M. Karim. Sciences – Mathematics

This project investigates how weather conditions, specific pollutants, and temperature fluctuations influence air quality and visibility globally. Using the 'GlobalWeatherRepository' dataset from kaggle.com, spanning from May 16, 2024, to January 25, 2025, we analyzed data from 210 locations. Our methods included data cleaning, developing predictive models, and creating visualizations using R. We hypothesized that weather conditions significantly affect air quality and visibility. The results revealed that nitrogen dioxide significantly impacts visibility (Estimate: -0.0093, $p < 0.001$), whereas sulfur dioxide does not (Estimate: -0.0001, $p = 0.607$). The correlation between temperature and ozone was moderate ($r = 0.32$), and the correlation between temperature and nitrogen dioxide was weakly negative ($r = -0.26$). Although the nitrogen dioxide relationship is significant, the low R-squared value indicates other factors also influence visibility. Knowledge gained in this study emphasizes the interactions between environmental factors and their impact on air quality and visibility. (Faculty Sponsor: Dr. Micah Thornton)

8. THE IMPACT OF ORAL HISTORIES ON NURSING HOME STAFF. M. Donahoe, J. Wilson. Nursing - Dallas

Background: The growing aging population, nursing shortage, and current landscape of understaffed long-term care (LTC) facilities collectively threaten quality patient care. When staff engages with residents in positive interactions, it increases residents' mental and physical quality of life. A nursing student created a LTC initiative in which the findings of oral histories on the residents were summarized in posters placed in the patients' rooms to promote patient/staff engagement. Purpose: to explore the perceptions and experiences of nursing home staff regarding the impact of a LTC oral history initiative on PCC. Methodology: phenomenological qualitative methodology, utilizing thematic analysis of transcripts from semi-structured interviews with LTC staff. Interview questions were created using the PeoPLe framework to address each aspect of PCC. Conclusions: Preliminary findings indicate oral histories show promise as an effective strategy to promote PCC in LTC. Findings will be disseminated to the LTC facility and corporate stakeholders and disseminated in a peer-reviewed journal. (Faculty Sponsor: Dr. Jennifer Wilson)

Supported by TWU Experiential Student Scholars Program.

Session 4. Wednesday, April 23, 9:00 am – 10:20 am

Zoom Link

1. SWEET FEET SOCKS, TURNING FOOD INTO FOOTWEAR: BEHAVIOR MODIFICATION USING TEXTURAL STIMULATION & OCTAVIA BUTLER'S CONCEPT OF "POSITIVE OBSESSION". S. Webb. Language, Culture, and Gender Studies

This project examines the creative and therapeutic potential of science fiction author and cultural theorist Octavia Butler's concept of "positive obsession" and proposes that positive obsession might help those who struggle with disordered eating to reconceptualize their relationship with food and transform the negative, injurious energy of disordered eating into positive, salubrious energy of creative practice. Despite the connotation of the word "obsession", Butler understood positive obsession to be a powerful, internal force that one could harness to assist personal and social change. Those who struggle with disordered eating—and who are intimately aware of the obsessive nature of food fixation—might have a wellspring of utilizable energy they can draw from to animate other areas of their lives and could even use those inner resources to produce creative or therapeutic behavior modification aids such as socks, fidgets, and textured cloth that could replace the stimulation of disordered eating. (Faculty Sponsor: Dr. AnaLouise Keating)

Supported by TWU Experiential Student Scholars Program.

2. INCREASING COMPETENCY BASED ORIENTATION SKILLS THROUGH USE OF AN EDUCATIONAL ACTIVITY. K. Williams. Nursing - Dallas

The onboarding process to any new hospital or nursing job typically includes a period of clinical orientation. This allows the new hire to become familiar with the hospital/unit procedures and receive hands-on training before working independently. This project examines how the creation of an educational activity can increase the number of competencies met during the orientation period. A module was drafted to include the assessment and management of a device commonly seen in the neurovascular intensive care unit, but not always available during the time restricted orientation period. This pilot activity includes the required skills, as determined by the hospital's education and neuroscience leadership department, to be marked as competent to care for an external ventricular device. New hires were given this educational activity as a supplement if the skills were not practiced during their time on orientation. The educational activity increases the readiness of the nurse to independent practice. (Faculty Sponsor: Dr. Cecilia Wilson)

3. DEVELOPMENT OF A DIAGNOSTIC PREDICTION MODEL FOR ACETABULAR DYSPLASIA PRESENCE AND SEVERITY IN YOUNG ADULTS WITH NONARTHRITIC HIP JOINT PAIN: RELIABILITY AND PILOT DATA. E. Bergman, S. Wang-Price, K. Mitchell, R. Patel, E. Mulligan, J. Wells. Physical Therapy - Dallas

Acetabular dysplasia (AD) is a common, yet frequently under-recognized cause of non-arthritic hip joint pain (NAHJP) and disability in young adults. Diagnosis of AD is made by radiographic measurements which do not adequately capture the clinical presentation of hip instability. Signs and symptoms that support radiographic findings are needed to assist clinicians in making timely referrals for imaging studies and possible surgical management. The purpose of this ongoing study is to develop a prediction model for the diagnosis of AD by using a broad range of potential clinical factors related to the radiographic presence of AD. Eligible participants are young adults with NAHJP with AD or non-AD diagnosed by radiographic findings. All participants undergo standardized measurements of hip range of motion, strength, and generalized hypermobility using a testing protocol that has been found to have good intra- and inter-rater reliability. Preliminary pilot data from this study will be presented. (Faculty Sponsor: Dr. Sharon Wang-Price

Supported by TWU Center for Student Research, Texas Physical Therapy Foundation Grant.

4. WITHDRAWN

5. FOSTERING CRITICAL THINKING: IMPLEMENTING PROBLEM-BASED LEARNING IN MIDDLE SCHOOL STEM CLASSROOMS. S. Heaney. Sciences – Mathematics

During this presentation, I will discuss the use of problem-based learning in a STEM setting ranging from middle school through university levels. I will also explore the implications of AI through problem-based tasks and how the teacher's role changes throughout these lessons. (Faculty Sponsor: Dr. Ann Wheeler)

6. CYCLES OF POWER: REDEFINING MENSTRUAL NARRATIVES FOR HOLISTIC WELLBEING AND EMPOWERMENT. J. Sanders. Quality Enhancement Plan

This project explores how menstrual cycle awareness fosters self-awareness, productivity, and holistic well-being. It challenges stigmas and reframes menstruation as a source of intuitive power rather than limitation. The exhibit highlights how cyclical energy patterns influence identity, creativity, and reflection, integrating biology, psychology, and productivity science. Visual cycle-mapping tools and artistic interpretations will demonstrate practical applications of cycle-based productivity strategies. This interdisciplinary work invites critical conversations about menstrual literacy's role in mental health, leadership, and personal growth. It aligns with my broader thought leadership initiative to amplify women's voices and redefine wellness narratives for the modern woman. The project encourages attendees to embrace menstrual cycles as central to discussing ambition, self-care, and community building. (Faculty Sponsor: Dr. Elizabeth Brownlow)

7. THE EXPERIENCES OF HEMATOLOGY-ONCOLOGY NURSES WITH GRIEF FOLLOWING THE DEATH OF THEIR PATIENTS. S. Binoy. Nursing - Houston

This study investigates the emotional, ethical, and professional challenges faced by oncology nurses in end-of-life care settings. Interviews with 13 nurses revealed core themes of ethical dilemmas, emotional strain, and burnout. Nurses frequently navigate conflicts between patient autonomy and family expectations, contributing to emotional distress. Stress is exacerbated by high patient-nurse ratios and limited time for emotional processing, making peer support and informal debriefing crucial. Younger nurses reported higher emotional strain compared to older, more experienced nurses, highlighting the generational divide in job satisfaction and retention. The findings suggest the need for improved emotional support systems, including debriefing sessions and better access to mental health resources. Recommendations include integrating emotional intelligence, ethical decision-making, and grief management into nursing education, and enhancing mentorship programs to support resilience. The study emphasizes the importance of fostering a supportive environment to improve nurse well- being and ensure high-quality patient care. (Faculty Sponsor: Dr. Wyona Freysteinson)

8. ADVOCATING FOR FAMILIES WITH CHILDREN IN SPECIAL EDUCATION. A. Powers, N. Gillum. Human Sciences

For this presentation, policies for children in special

education will be reported. The purpose of this research is to provide information to families in a family friendly way to help educate them on policies available for their children. (Faculty Sponsor: Dr. Nerissa Gillum)

9. PATHWAY TO RECOVERY. C. Baker. Nursing - Dallas

The education of thoracic surgery nurses, especially those caring for patients undergoing esophagectomy, lacks clarity, with few evidence-based practice (EBP) guidelines for critical aspects such as medication administration, nasogastric (NG) tube management, diet, and activity. This project aims to enhance nursing education by developing standardized clinical care pathways for ICU and step-down nurses. These pathways will provide clear, evidence-based instructions to improve nursing knowledge and patient outcomes. Two handouts will be distributed: a one-page checklist outlining daily care guidelines and an educational handout explaining common complications in esophagectomy patients. The expected outcome of implementing these educational tools is consistency in nursing care, enhanced autonomy, and improved clinical decision-making. Pre- and post- test surveys will assess nursing knowledge and satisfaction, with patient metrics also monitored. By strengthening nursing education through evidence-based pathways, this project aims to ensure standardized care, enhance nursing clinical expertise, and optimize the quality of care for esophagectomy patients. (Faculty Sponsor: Dr. Cecilia Wilson)

Session 5. Wednesday, April 23, 2:40 pm – 4:00 pm

Zoom Link

1. USING CHAT GPT AND DEEPSEEK AI TO PRODUCE LESSON PLANS FOR TEACHING THE VOLLEYBALL SKILL OF SETTING TO INTERMEDIATE LEVEL 15 YEAR OLD GIRLS VOLLEYBALL PLAYERS. C. Pool, M. Mann. Kinesiology

This study explores AI's role in designing effective pre-season training for a 15-year-old volleyball setter. Using ChatGPT and DeepSeek, I developed three-week plans alternating skill-based and physiological training, emphasizing core strength, cardiovascular conditioning, and injury prevention. Each one-hour session includes benchmarks like pulse and heart rate monitoring to track workload. To enhance the AI-generated plans, I applied prompt engineering for greater specificity and quality. Four expert coaches (Coach Hamiter, Coach Bill, Dr. Mann, and myself) evaluated the programs, with initial feedback by February 24th and a detailed review by March 8th. Their input will refine the plans for the final paper and presentation. Additionally, I assessed how ChatGPT and DeepSeek improved with advanced prompts. This project highlights AI's potential in sports training, offering a structured, data-driven approach for high school athletes and valuable insights into AI's role in optimizing coaching strategies. (Faculty Sponsor: Dr. Mark Mann)

Supported by TWU Experiential Student Scholars Program.

2. GIRLS INTERRUPTED: A MARXIST ANALYSIS OF HERMANAS. J. Cooke. Language, Culture, and Gender Studies

This presentation analyzes Julia Solomonoff's Hermanas through a Marxist lens, examining its critique of the "American Dream" as it relates to capitalism, escapism, and false prosperity. It explores how cinematographic elements– lighting, costuming, and set design– reinforce these themes while shaping the film's political and emotional landscape. Additionally, the discussion considers Latin American communist movements, with a focus on Argentine resistance to the 1976 junta dictatorship. By investigating the intersections of ideology, displacement, and visual storytelling, this analysis positions Hermanas as both a political statement and an aesthetic meditation on historical memory and economic struggle. (Faculty Sponsor: Dr. Angela Mooney)

3. COMMUNITY RESEARCH PARTICIPANTS INDICATE A PREFERENCE FOR ASRH OVER CSC. M. Preciado, J. Alejandro-White, M. Denbow, D. Olson, J. Wilson. Nursing - Dallas

Limited research exists on public awareness of stroke center designations (ASRH, PSC, TCSC, CSC) and their treatment capabilities. Community education on stroke signs, symptoms, and calling 911 promptly is essential to improve stroke care. This study examined public perception of stroke center designations, EMS use, and hospital preferences for stroke treatment. A non-randomized survey of 249 English-speaking adults at a Southwestern U.S. plasma donation center was conducted. Respondents were diverse, living within a 100-mile radius. Results showed 82% would call 911, while 18% would drive a loved one. Only 21% identified CSCs as offering the best care. Preferences were 36.3% for ASRH, 38.3% for PSC, and 4.4% for TCSC. The finding that 20% would self-transport highlights the need for targeted education promoting EMS use. The inverse relationship between certification status and preference suggests knowledge gaps may cause treatment delays, necessitating improved outreach and further research. (Faculty Sponsor: Dr. Jennifer Wilson)

4. UTILIZING ENGAGING MATHEMATICAL TASKS TO PROMOTE STUDENT UNDERSTANDING IN STEM. R. Hammontree. Sciences – Mathematics

During this presentation, I will explore the use of mathematical tasks to aid student understanding in middle school STEM classrooms. Sample activities that include student work will be detailed with ways in which to modify tasks for further enrichment. (Faculty Sponsor: Dr. Ann Wheeler)

5. AN EXPLORATION OF BURNOUT, MORAL DISTRESS, AND MORAL INJURY: A NATIONWIDE SURVEY OF THEIR INFLUENCE ON WELL-BEING IN PHYSICAL THERAPISTS. K. Miller, J. Thomas, M. Thompson, R. Hulla, L. Rubin. Physical

Therapy - Dallas

Background: More than 50% of physical therapists (PTs) experience burnout, which is linked to job turnover, poor quality of patient care, and poor well-being. Despite interventions, burnout prevalence remains high, suggesting that moral injury may be a contributing factor. This study aimed to explore the relationships among burnout, moral injury, intention to leave the job, quality of care, and well-being. Methods: Surveys were emailed to licensed PTs recruited through 18 state licensing board email lists. Results: A total of 703 valid surveys from 37 states and Washington, DC, were analyzed. Moderate to strong associations were identified between both burnout and moral injury with poor quality of care and well-being. Conclusion: Addressing both burnout and moral injury is crucial for improving PT job satisfaction, patient care quality, and overall well- being. Comprehensive strategies targeting these issues are essential for sustaining the PT workforce and enhancing healthcare outcomes. (Faculty Sponsor: Dr. Jodi Thomas)

Supported by TWU Center for Student Research.

6. EXPLORING THE USE OF THREE ACT MATH TASKS TO ENHANCE STEM INSTRUCTION. K. Loredo. Sciences – Mathematics

In this presentation, I will investigate the idea of using three act mathematical tasks in STEM classrooms to enhance instruction in the middle grades. Discussion of sample student problems with work will be detailed, as well as ways in which teachers can modify tasks for various levels. (Faculty Sponsor: Dr. Ann Wheeler)

7. FLAME IN THE FACE OF SB17: UPHOLDING COMMUNITY CULTURAL WEALTH IN HIGHER EDUCATION. C. Wright-Davis, A. Myers, R. Francis. Literacy and Language

This study seeks to explore the role of multicultural student organizations in supporting current university students' community cultural wealth (CCW) and sense of belonging in the wake of SB17. Our hope is that this study might guide those seeking to support underserved student populations at the university level. Yosso's (2005) Community Cultural Wealth Model (CCW) challenges traditional views of cultural capital, which often emphasize the advantages held by dominant groups in society. Yosso introduced this theoretical model as part of her broader work in Critical Race Theory (CRT) to highlight and validate the strengths, knowledge, and skills possessed by marginalized communities, particularly communities of color (Yosso, 2005). CCW posits that communities of color possess a wealth of cultural knowledge, skills, abilities, and networks that often go unrecognized or undervalued by mainstream society. (Faculty Sponsor: Dr. Aimee Myers)

8. INVESTIGATING ARCHIVAL RESEARCH IN THE UNDERGRADUATE WRITING CLASSROOM. A. Beretta. Language, Culture, and Gender Studies

In this study, I explore instructor methods of implementing archival research in their undergraduate writing classrooms to understand first, what the perceived benefits are and second, some challenges teachers face in teaching this method. I will discuss some important themes that have emerged from my data analysis including an increase in student engagement in learning, original research as a benefit of archival research methods, questions of provenance and contest in archival spaces, the need for greater support and training in archival research methods, and the importance of librarians and archivists who organize, preserve, and teach archival concepts and terminology. I also discuss the way archival research opens student and scholar access to diverse cultural artifacts and historical information they may not previously have had, or in other circumstances have, access to. Lastly, I will present some ideas for integrating archival research in ways that accommodate varying course pacing and curriculums. (Faculty Sponsor: Dr. Jacquelyn Hoermann-Elliott)

9. THE COST OF PROTECTIONISM: HEALTHCARE AFFORDABILITY, TRADE, AND AGING POPULATIONS IN THE U.S. AND MEXICO. T. Fields III. Health Care Administration

The U.S. imports $22.33 billion in medical devices and equipment from Mexico annually. A proposed 25% tariff on these imports could significantly impact healthcare affordability, supply chains, and cross-border trade. This research will examine the economic, demographic, and policy implications of such a tariff, focusing on its effects on: 1) U.S./Mexico medical device affordability; 2) Trade dynamics; 3) Aging populations in both countries, and 4) How will Mexican medical manufacturers and policymakers adapt to U.S. tariffs. The methodology includes quantitative analysis of historical tariff impacts, qualitative assessments of policy responses, and stakeholder interviews. This research aims to provide invaluable insights, and policy recommendations to mitigate disruptions and ensure medical supply stability. (Faculty Sponsor: Dr. Rigoberto Delgado)

Session 6. Wednesday, April 23, 6:00 pm – 7:20 pm

Zoom Link

1. BEST PRACTICES IN NURSING SIMULATION: ENHANCING FACULTY TRAINING FOR IMPROVED HEALTHCARE EDUCATION. N. Pierce. Nursing - Dallas

Effective simulation is essential for preparing nursing students to meet the complexities of modern healthcare. In collaboration with nursing faculty as part of a faculty development initiative and a master's educational project, standardized simulation training modules for faculty are being developed based on recommended best practices, guidelines, and frameworks from leading organizations in

nursing simulation and patient safety such as NLN, INACLS, and AHRQ. Topics will include incorporating the golden standards of simulation in high-fidelity scenarios, integration of standardized patients, and utilization of comprehensive standardized frameworks to align simulations with clinical competencies. The key focus will be on enhancing consistency, student engagement, and skill acquisition. Through the training received in the modules, faculty will gain tools to elevate simulation-based learning in both academic and clinical settings. These training modules will be an excellent resource for nursing educators, administrators, and simulation specialists seeking to advance best practices in healthcare training. (Faculty Sponsor: Dr. Cecilia Wilson)

2. THE IMPACT OF ONLINE INSTRUCTIONAL SETTINGS ON ACHIEVEMENT IN STUDENTS WITH LEARNING DISABILITIES. A. Kandola. Teacher Education

The rise of online learning has prompted discussions on its effectiveness for students with disabilities. This study synthesizes findings from systematic literature examining how online instructional settings impact the academic achievement of students with disabilities, including those with learning disabilities, ADHD, autism spectrum disorder, and other exceptionalities. Through an analysis of multiple studies, this research explores the benefits, challenges, and key factors influencing success in online education. Findings indicate that while online learning offers flexibility, accessibility, and individualized supports, barriers such as reduced engagement, difficulties with accommodations, and disparities in instructional quality remain significant concerns. The presentation will highlight the importance of structured online interventions, teacher presence, and technology accessibility in fostering equitable learning experiences per peer-reviewed literature findings. These insights will contribute to ongoing discussions related to optimizing virtual education for students with disabilities and inform future research directions aimed at improving online instructional practices. (Faculty Sponsor: Dr. Maria Peterson)

3. BRIDGING CULTURAL GAPS: NURSING CONFIDENCE IN TREATING IMMIGRANT PATIENTS WITH CULTURAL AND LANGUAGE BARRIERS. L. Lemmon, G. Smith. Social Work, Psychology, and Philosophy

This study aims to investigate the relationship between second language proficiency on nursing students' cultural competency, specifically in treating Black immigrant (BI) patients. BIs account for a high percentage of the Black community, increasing from around 800,000 in 1980 to over 4.6 million in 2019. Cultural differences and language barriers mark clear delineations between African Americans (AAs) and BIs, however health data often places BIs and AAs into one ill-fitting category of assumed homogeneity. While language barriers are a significant factor in health, improving patient experience goes beyond simple translation or interpreters. Linguistic differences are an indicator of cultural differences, and translation without cultural awareness and competency can lead to further misunderstandings. If healthcare providers are engaging with BIs and AAs as a monolithic community, with the only variation being language, they will fail to address these significant differences in cultural practices and attitudes towards healthcare and preventative screenings. (Faculty Sponsor: Dr. Gabrielle Smith)

Supported by TWU Experiential Student Scholars Program.

4. HOW NUMBER TALKS CAN ENHANCE STUDENT LEARNING OF STEM. J. Isidore, S. Bult. Sciences – Mathematics

In this presentation, we will explore how number talks in middle grades support students' understanding of STEM concepts. We will examine sample problems alongside student work and discuss modifications for teachers to enhance their instructional approaches. (Faculty Sponsor: Dr. Ann Wheeler)

5. DETERMINANTS OF DEPRESSION AMONG LEFT- BEHIND AND NON-LEFT- BEHIND CHILDREN IN RURAL CHINA. J. Rivera. Social Work, Psychology, and Philosophy

In modern China, most impoverished individuals reside in rural areas, where their livelihoods primarily depend on agriculture. In comparison, Chinese urban residents have opportunities to enjoy numerous advantages such as a social security system that protects them from extreme poverty, resulting in internal migrations in search of economic prosperity. Migration within China is often temporary, with only some household members participating. The result is a divided household with an abundance of left-behind children (LBC). China has witnessed an explosive growth of LBC in the past few decades. The mental health of these children is often at risk due to being separated from their parents. This research reviews scholarly sources to examine the individual, family, and social determinants of depression among left-behind children (LBC) in rural China compared to their non-left-behind peers. Empirical data collected from two middle schools in rural China will be used for hypothesis testing. (Faculty Sponsor: Dr. Yong Li)

6. NAVIGATING THE BORDERLANDS THROUGH THE ASIAN DIASPORA. C. Tipmanee. Language, Culture, and Gender Studies

This presentation, inspired by To Live in the Borderlands by Gloria Anzaldúa, examines the experiences of the Asian Diaspora in Latin America through the works of Asian Latin American poets and writers. By exploring both ancestral and contemporary narratives, this presentation highlights the complexities of living in a cultural divide. Writers such as Julia Wong Kcomt use poetry to articulate the tensions of ethnic guilt and the process of navigating multiple cultural identities. Through close readings of their work, this

presentation investigates how these writers confront and resist cultural marginalization, offering a unique lens into the intersection of race, ethnicity, and identity in Latin American literature. (Faculty Sponsor: Dr. Angela Mooney)

7. WIDOWHOOD UNVEILED: EXPLORING PHYSICAL, MENTAL AND SOCIAL DIMENSIONS. J. Kennedy. Nursing - Houston

Widowhood, the loss of a spouse, is a profound and life-altering experience with significant implications for an individual's overall well-being. This article explores the impact of widowhood on physical, mental, and social health by reviewing relevant literature and empirical studies. The analysis highlights how grief, social support, coping strategies, and resilience shape the widowhood experience. Widowed individuals often face psychological challenges such as depression, anxiety, and existential struggles as they adjust to life without their partner and redefine their sense of self. Widowhood is linked to an increased risk of physical health issues, including cardiovascular problems, immune system dysfunction, and higher mortality rates. Despite these challenges, many widowed individuals exhibit remarkable resilience. Key factors such as strong social support networks, effective coping mechanisms, and finding meaning in loss contribute to reducing the adverse effects of widowhood. Understanding these protective factors can guide the development of nursing interventions that support bereaved individuals and enhance their well-being. (Faculty Sponsor: Dr. Wyona Freysteinson)

8. USE OF FITBITS TO MONITOR STEPS PER DAY IN HEALTHY ADULTS. B. Cyprowski, L. Harris, K. Mitchell, C. Bickley. Physical Therapy - Houston

This study examined (1) the criterion validity of a standard FitBit compared to an Actigraph accelerometer and (2) the impact of health benefit education on steps per day (SPD) achieved. Fifteen healthy adult subjects wore either a FitBit or a FitBit and an Actigraph simultaneously. All participants were assigned a 6,000 SPD target but were randomized into one of three groups, providing the health benefits of achieving 6,000, 8,000, or 10,000 SPD. Results revealed a significant ($p < 0.05$) strong, positive correlation between FitBit and Actigraph SPD, though the FitBit tended to underestimate steps. There were no significant differences in average SPD among the education groups, likely due to the small sample size. In conclusion, while the devices are not interchangeable, the FitBit appears to provide an accurate measure of daily step count. (Faculty Sponsor: Dr. Christina Bickley)

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LIST OF TWU COMPONENTS WITH STUDENTS PRESENTING

Accounting and Finance
Arts and Design – Dance
Arts and Design – Fashion Design and Merchandising
Arts and Design – Music
Arts and Design – Visual Arts
Business
Communication Sciences and Oral Health
Early Childhood Education
Educator Preparation Program
Health Care Administration
Health Promotion
Honors Program
Human Sciences
Kinesiology
Language, Culture, and Gender Studies
Literacy and Language
Management and Marketing
Nursing (Dallas, Denton, Houston)
Nutrition and Food Sciences - Denton
Occupational Therapy - Dallas
Physical Therapy (Dallas, Denton, Houston)
Quality Enhancement Plan
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Sciences – Chemistry and Biochemistry
Sciences – Computer Sciences
Sciences – Environmental Science
Sciences – Mathematics
Social Sciences and Historical Studies
Social Work, Psychology, and Philosophy
Teacher Education

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Dr. Ann Wheeler (Sciences – Mathematics)
Dr. Cecilia Wilson (Nursing - Dallas)
Dr. Jennifer Wilson (Nursing - Dallas)
Dr. Aya Yoshikawa (Health Promotion)

SCHEDULE OF EVENTS

Refreshments will be available in the Southwest Ballroom 2300 during all poster sessions. The registration table will be located outside the Student Union 2300 Southwest Ballroom.

Tuesday, April 22, 2025

9:00 a.m. – 10:20 a.m.	Poster Presentations Platform Presentations Virtual Presentations*	Student Union 2300 (Southwest Ballroom B) Student Union 2231 (A) and 2238 (B) Zoom (see complete link below)
10:30 a.m. – 12:00 p.m.	Celebration of Research for Graduate Council Award for Exceptional, Original Scholarship and Chancellor's Student Research Scholars	Student Union 2231
12:00 p.m. – 1:00 p.m.	Chancellor's Luncheon to Honor Student Research Scholars and Graduate Council Awardees (invitation only)	Student Union Southwest Ballroom A
1:30 p.m. – 2:30 p.m.	Keynote Speaker: Katherine Walker, PhD	Student Union 295 (Bridges Auditorium)
2:40 p.m. – 4:00 p.m.	Poster Presentations and TWU Bettye Myers Butterfly Garden Photo contest Platform Presentations Virtual Presentations*	Student Union 2300 (Southwest Ballroom B) Student Union 2231 (A) and 2238 (B) Zoom (see complete link below)
6:00 p.m. – 7:20 p.m.	Poster Presentations Platform Presentations Virtual Presentations*	Student Union 2300 (Southwest Ballroom B) Student Union 2231 Zoom (see complete link below)

Wednesday, April 23, 2025

9:00 a.m. – 10:20 a.m.	Poster Presentations Platform Presentations Virtual Presentations*	Student Union 2300 (Southwest Ballroom B) Student Union 2231 (A) and 2238 (B) Zoom (see complete link below)
10:30 a.m. – 11:30 a.m.	WoMENTORING**	Student Union 2231 and via Zoom
1:30 p.m. – 2:30 p.m.	Amplify Your Impact Celebration and Panel Discussion	Student Union 2238
2:40 p.m. – 4:00 p.m.	Poster Presentations and TWU Bettye Myers Butterfly Garden Photo contest Platform Presentations Virtual Presentations*	Student Union 2300 (Southwest Ballroom B) Student Union 2231 (A) and 2238 (B) Zoom (see complete link below)
4:00 p.m. – 5:00 p.m.	Experiential Student Scholars and McNair Scholars Celebration (invitation only)	Student Union 2238
6:00 p.m. – 7:20 p.m.	Poster Presentations Platform Presentations Virtual Presentations*	Student Union 2300 (Southwest Ballroom B) Student Union 2231 Zoom (see complete link below)

* Virtual sessions on Zoom at https://twu-edu.zoom.us/j/88995097572?pwd=8v7O202EF1JvApAqO8IVqX2rkWWGkb.1

** WoMENTORING on Zoom at https://twu-edu.zoom.us/j/83547866587?pwd=sudyxQSpUEEJVtUaPzClhztQ55qeZB.1