8TH STEM ED ANNUAL CONFERENCE

SCIENCE
TECHNOLOGY
ENGINEERING
MATHEMATICS

Toward Transformative Practices: STEM Pathways Beyond Borders - Global Perspectives for the Future










Advisory Board Members

Schedule at-a-glance

Day	Time (Central Time)	Item
Feb 13	2:00 PM – 6:00 PM	On-Site Registration Board Meeting (Closed)
Feb 14	7:30 AM – 6:00 PM	On-Site Registration and Check-In
	9:00 AM – 10:15 AM	Opening Keynote: Bethlehem Gronneberg
	10:20 AM – 11:20 AM	Concurrent Session A
	11:25 AM – 12:25 PM	Concurrent Session B
	12:30 PM – 1:45 PM	Plenary Luncheon: Greses Perez
	2:00 PM – 3:00 PM	Concurrent Session C
	3:05 PM – 4:05 PM	Concurrent Session D
	4:10 PM – 5:10 PM	Concurrent Session E
	5:10 PM – 5:30 PM	Poster Setup
	5:30 PM – 6:30 PM	STEM Panel Discussion
	6:30 PM – 8:00 PM	Poster Session and Social
Feb 15	7:30 AM – 2:00 PM	On-Site Registration and Check-In
	9:00 AM – 10:00 AM	Concurrent Session F
	10:05 AM – 11:05 AM	Concurrent Session G
	11:10 AM – 12:10 PM	Concurrent Session H
	12:15 PM – 1:15 PM	Concurrent Session I
	1:15 PM – 2:15 PM	Closing

About our Invited Speakers and Guests

Bethlehem Gronneberg

Bethlehem Gronneberg is the Chair of Mathematical Sciences and Director of Data Science at St. Catherine University in St. Paul, Minnesota. She earned her Ph.D. and master's in software engineering from North Dakota State University, along with a Bachelor's in Statistics and Computer Science from Addis Ababa University in Ethiopia. Her tech career began as a webmaster for the United Nations Economic Commission for Africa, and over the past two decades, she has held various roles in the tech industry, including Software Engineer, Senior Software Engineer, and Software Engineering Manager. Motivated by the inequities she observed in software product development, Gronneberg founded uCodeGirl, a non-profit advocating for increased female participation in technology. A recipient of the prestigious Bush Foundation Leadership Fellowship, she has received numerous accolades, including the YWCA Woman of the Year in Science and Technology, Exceptional Women Leaders, and Inclusive Global Leaders awards. Gronneberg has spoken at international conferences, contributed to technology columns, and was honored as a guest of a U.S. senator at the State of the Union address. She is dedicated to ensuring that technology creators reflect the diverse communities they serve.

Greses Pérez

Greses Pérez is the McDonnell Family Assistant Professor in Engineering Education Research in the Civil and Environmental Engineering Department at Tufts University. She also holds secondary appointments in Mechanical Engineering and Education. Her research advances theoretical models and pedagogical approaches that connect the language and culture of communities with engineering practices. In her 2023 NSF CAREER award and two other NSF grants, she focuses on connecting communities with engineering and designing climate technologies in multilingual environments. Through this work, she seeks to develop and test principles about the link between disciplinary epistemologies and practices and community resources, engaging students in investigating, designing, and communicating essential engineering knowledge about technological systems and solutions. Pérez currently serves as a guest editor for the Special Issue on Language in Engineering and Science in the *Journal of Research in Science Teaching*. She earned a Ph.D. in Learning Sciences and Technology Design from Stanford University, and two master's degrees in engineering and education from the University of Puerto Rico at Mayagüez and Southern Methodist University.

Stephanie Briggs

Stephanie Briggs (she/her/they), MA, is the principal owner of Be.Still.Move., a program of arts and embodied-based contemplative practices. For over 30 years, Stephanie has created and led healing and contemplative-based programs across the country. She specializes in contemplative practices from a number of cultural perspectives to include storytelling, writing, movement, and art, fostering community growth through the development of intra- and inter-connectedness as the foundation for socially engaged action. She has provided contemplative practices AAC&U's Undergraduate STEM Institutes, for the STEM Women of Color Conclave, University of North Carolina in Greensboro, Claflin University in South Carolina, the US Geological Survey, John Jay College of Criminal Justice in NYC, Northern Kentucky University, Notre Dame South Bend, and others. She is a trained facilitator of 400 Years of Inequality Mindfulness training and has certifications Mindful Compassion Training, Authentic Leadership, Stephens Ministry, and MBSR.

STEM Education Conference Recognitions

The 8th Annual STEM Education Conference represents countless hours of dedication and collaborative effort. We are deeply grateful to the following individuals and organizations whose commitment and support made this event possible.

STEM Education Advisory Board Members

Uma Ganesan, Conference Chair

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Friday, February 14, 2025 Day 1 Concurrent Sessions	
Location/Format	Session Information
Location: Grand Ballroom 9:00 AM – 10:00AM	*Unveiling Key Factors of Female Persistence in Computer Science using AI's Natural Language Processing (NLP) Techniques* This comparative research paper explores retention through the lens of students who have persisted, offering insights that can guide future initiatives to foster a more equitable environment in STEM education. Keynote: Bethlehem Gronneberg
Concurrent Session A **10:20 AM – 11:20 AM**	
Location: Great White Format: Interactive Workshop	*Creating Community in These ~~Hot Mess~~ Spicy Disaster Times* "I am what I am because of who we all are." This session invites us to experience and develop pathways toward transformative, communal engagement with each other through deep looking, listening, play, and joyful practices, leading towards expanding our curiosity, empathy, understanding, self-compassion, and compassion for others. Presenter: Stephanie Briggs
Location: Tarpon Format: Deeper Dive	*Raíces y Ciencia: Environmental STEM Education Through Cultural Sustenance in Rio Grande Valley Schools* This presentation explores how cultural sustenance and community knowledge can enhance environmental STEM education in Rio Grande Valley schools. We will discuss the "Raíces y Ciencia" program, which integrates culturally relevant practices and local environmental contexts into STEM learning. Presenter: Uma Ganesan
Location: Marlin Format: Research Paper	*Evaluation of a New Engineering Students Leadership Academy at a Resource-Limited HSI in South Texas* Recognizing that successful engineering careers require more than technical knowledge, the College of Engineering and Computer Science (CECS) at the University of Texas Rio Grande Valley (UTRGV) organized a multiple-session academy focused on cultivating key leadership competencies. Results from the evaluation of the program indicate high student satisfaction and learning. Presenters: Jean McLaughlin, Seokmin Kang, Thuy Vu
	STEM Gender Difference in First-Year College Engineering Students This study explores the persistent gender gap in engineering by examining differences in academic performance, motivation, and career aspirations between male and female first-year college engineering students. We will

	discuss the findings and implications for creating more inclusive engineering programs. Presenters: Pierre Lu, Noe Vargas, Javier Ortega, Arturo Fuentes, Eleazar Márquez
	Transformative STEM Learning through AI-POWERED Chatbot: Impact of Personalized Learning on Student Achievement and Attitude This research investigates the use of an AI-powered chatbot to provide personalized learning experiences in STEM education. We will share the results of a study examining the chatbot's impact on student achievement, learning attitudes, and engagement. Presenter: Alli Olawale Abdurrazaq
Location: Swordfish Format: Research Paper	*Strategies Students Use to Graph Function Transformations* This presentation will explore the various strategies that students employ when graphing function transformations. We will discuss common approaches, misconceptions, and effective pedagogical practices for teaching function transformations in mathematics courses. Presenter: Roxana Jimenez
	Attitude of Students Towards the Use of LMS and AI in Biological Drawing in Africa This research investigated the attitude and gender view of students towards the use of TEA LMS and AI in biological drawing. The study was an explanatory sequential quasi-experimental design. The results showed that there is no significant difference in the attitude and gender of students taught using the methods. Presenters: Benjamin Onuorah, Peter Okebukola, Michael Ahove, Juma Shabani
	Transforming Gateway Courses: Increasing Access to STEM pathways This study examines strategies for improving student success in gateway STEM courses, which often serve as barriers to entry into STEM fields. We will discuss innovative pedagogical approaches, support services, and curricular revisions aimed at increasing student access to STEM pathways. Presenters: Amy Weimer, Nicholas Weimer, Yashwant Singh Katailiha, Brooke Rudeloff, Emily Suh, Carolyn Chang

Location: Marriott Courtyard Falcon Format: Research Paper	*Cybersecurity Without the Headache: A Culturo-Techno-Contextual Approach* This study examined the effectiveness of the Culturo-Techno-Contextual Approach (CTCA) in teaching cybersecurity to secondary school students. Results showed a statistically significant difference in achievement between the CTCA group (M=19.26) and control group (M=13.46), $F(1,48)=25.72$, $p<.05$, indicating CTCA's potential in improving student performance. Presenters: Joshua Akinpelu, Peter Okebukola
	Gender as a Contextual Mitigating Factor in Science Learning: Exploring Culturo-Techno-Contextual-Approach in Rewriting the Narrative This study examines how gender interacts with cultural, technological, and contextual factors to influence science learning. We will discuss the Culturo-Techno-Contextual-Approach, a framework for addressing gender disparities in science education by creating more inclusive and culturally responsive learning environments. Presenter: Adekunle Ibrahim Oladejo
	Investigating the Efficacy of Integrative STEM Education ISE on Improving Student Outcomes in Secondary School This study investigates the impact of Integrative STEM Education (ISE) on student learning outcomes in secondary school. We will share findings on how ISE, which emphasizes interdisciplinary connections and real-world applications, affects student achievement, motivation, and engagement in STEM subjects. Presenter: Adeniran Itunuoluwa Adewumi

Concurrent Session B 11:25 AM - 12:25 PM	
Location: Great White Format: Interactive Workshop	*Creating Community in These ~~Hot Mess~~ Spicy Disaster Times* "I am what I am because of who we all are." This session invites us to experience and develop pathways toward transformative, communal engagement with each other through deep looking, listening, play, and joyful practices, leading towards expanding our curiosity, empathy, understanding, self-compassion, and compassion for others. Presenter: Stephanie Briggs
Location: Tarpon Format: Research Paper	*STEM Education Through a Cultural Lens* Nigeria's northern region significantly underrepresented its diverse cultural landscape in STEM education. This paper proposes a culturally responsive STEM curriculum. Incorporating students' identities and experiences can enhance engagement and learning outcomes. A tailored approach is essential for improving STEM education in Nigeria's northern region. Presenter: Georgina Eberechi Chris-Kalu
	The Impact of Culturo-Techno-Contextual Approach on Students' Achievement in and Anxiety Towards Chemistry The study investigated the effect of Culturo-Techno-Contextual approach on students' achievement and anxiety towards chemistry. The study

	adopted a quasi-experimental design involving 143 SS 3 students from two schools. Findings revealed that students taught using CTCA had a significantly better achievement and lower anxiety than those taught using lecture method. Presenters: Joy Olayemi, Michael Ahove, Hakeem Akintoye, Peter Okebukola, Rasheed Sanni, Uchenna Ugwuoke
	Evaluating the Impact of CTCA on AI Achievement Across Gender and Parental Education Presenter: Andrew Tetteh
Location: Marlin Format: Research Paper	*Improving Cybersecurity Education in Global South: Testing the Efficacy of CTCA and Nkrumah 1.0 App* This study examines the impact of the Culturo-Techno-Contextual Approach (CTCA) and the Nkrumah 1.0 App on enhancing student achievement in cybersecurity risk management within Ghanaian universities' Open, Distance, and e-Learning (ODeL) systems. Findings reveal both CTCA and Nkrumah 1.0 significantly outperform traditional lectures, underscoring culturally relevant, technology-integrated teaching methods' effectiveness. Presenters: Peter A. Okebukola, Alejandro Gallard Martinez
	Potency of CTCA in Enhancing the Achievement of Senior Secondary School Physics Students in Optics Culturo-Techno-Contextual Approach (CTCA) represents a pedagogy composed of culture, technology, and context with the aim of alleviating challenges in students' comprehension of various concepts in STEM. At the secondary school level, students find optics challenging. Hence this study examines CTCA's potency in improving students' achievement in this aspect of physics. Presenters: Sir John Iyk Ogonenwe, Rahman Tunde, Peter A. Okebukola
	Utilizing CTCA and Gbeleyi 1.0 with Cognitive Task Analysis to Support Students' Mastery of Database Management Systems in ICT Presenters: Oladipupo Oluwadamilola Rebecca
Location: Swordfish Format: Research Paper	*Niños y niñas de 3-6 años su percepción de los servicios ecosistémicos de espacios verdes* Este trabajo busca conocer la percepción infantil (entre 3-6 años) sobre los servicios ecosistémicos de los espacios verdes. Dichos espacios les permiten jugar, aprender, y estar en movimiento. El taller "Construye tu parque", pretende que desarrollen una relación positiva con la naturaleza al despertar su curiosidad y mejorar habilidades sensoriales. Presenters: Ilse Denisse Sánchez Jiménez, Mariana Alejandra Beltrán Díaz
	Pensamiento algebraico a partir de un pensamiento estructural en futuros docentes de primaria

	Se presentan resultados sobre formas de resolver una tarea que requiere de un pensamiento estructural. Utilizar material concreto para trabajar el valor posicional facilita la comprensión de estructuras del sistema decimal. La investigación se llevó a cabo desde un enfoque cualitativo con estudiantes del nivel de Licenciatura en Educación Primaria. Presenters: Silvia Eduviges Hinojosa Rizo, Silvia Lizette Ramos de Robles, Sofia Karina Vázquez Gómez
	Propuesta de comunicación en riesgos dirigido a niños y adolescentes de comunidades rurales en Michoacán El cultivo de aguacate ha crecido globalmente, utilizando plaguicidas que resguardan su productividad. Sin embargo, estas sustancias pueden provocar efectos negativos en la salud, especialmente en niños y adolescentes, que son más vulnerables. Se plantea una estrategia de alfabetización en salud contextualizada e interdisciplinaria para atender los problemas locales. Presenters: Rosaura Méndez González, Adrian Eduardo Castañeda Ochoa
Location: Marriott Courtyard Falcon Format: Research Paper	*CTA in Action and Teachers' Perceptions of CTCA and PFM for Teaching Circulatory System* This study examines the use of Cognitive Task Analysis (CTA) to simplify the circulatory system in STEM education and assesses teachers' perception on two innovative methods, the Culturo-Techno-Contextual Approach (CTCA) and Paced Flexible Model (PFM), aiming to improve students' achievement and attitudes in biology. Presenters: Hassan Nusirat Adebukola, Peter A. Okebukola, Franklin U. Onowugbeda
	Analyzing Programming Cognitive Complexity: Teachers' Views on CTCA, Gbeleyi 1.0, and Student Achievement & Attitudes Presenters: Ishaq Jamal O., Olasunkanmi Gbeleyi
	Cognitive Task Analysis: Teachers' Perception of CTCA and Gbeleyi 1.0 in Students' Network Topology Achievement Presenter: Oyinloye Lydia Moradeyo

Concurrent Session C 2:00 PM – 3:00 PM	
Location: Great White Format: Interactive Workshop	*JSTEM Session* High school students from the Rio Grande Valley engaged in original research projects during the summer of 2024. The JSTEM Alumni will present their findings. The JSTEM presentations can be viewed on pp. 25-27. This will be followed by a discussion of their K12 STEM education experiences. Moderator: Megan Keniry

	Facilitators: Joshua Reyna, Lluvia Garcia, Matilde Alanis, Victor Hernandez JSTEM Presenters: Amy Dominguez, Elisa Martinez, Hennesy Rodriguez, Ivan Gomez, Jose Salinas, Margarita Villasana, Matthew Reyna, Miranda Salas Hilario, Nelly Contreras, Nylin Alonzo, Sophia Morrison, Wendy Villalobos
Location: Tarpon Format: Deeper Dive	*Engaging Students in STEM Fields Through Community Pet Rescue: Creative Pedagogical Practices Introducing STEM Pathways* This roundtable discussion will invite participants to explore and discuss with the presenters' creative pedagogical ways to introduce and engage youth in various STEM fields via community pet rescue. Presenters: Karin Lewis, Zulema Williams
Location: Marlin Format: Interactive Workshop	*Estrategia educativa niñez 9 a 12 años; importancia de la conservación y contaminación del agua* Este trabajo busca sensibilizar a los niños de secundaria (9 a 12 años) frente a problemáticas del sometida el agua, como es su conservación, aprovechamiento y uso, su contaminación, por un taller "Actividad 1: Protectores del Agua", pretende que los asistentes se concienticen y desarrollen herramientas para conservar el agua. Presenters: Diana Aideé Ortega Ríos, Roció Mayela Quevedo Huerta
Location: Swordfish Format: Research Paper	*Enseñanza de las ciencias: entre la interculturalidad y la regulación cognitiva* Se resalta la importancia de integrar factores contextuales en la enseñanza de ciencias en secundaria, por ejemplo, incorporar saberes y prácticas tradicionales de la comunidad escolar, así como estrategias didácticas clave, como la regulación cognitiva del docente, que pueden potenciar la efectividad en el proceso de enseñanza en STEM. Presenters: Milagros de Jesús Cázares Balderas, Alma Adrianna Gómez Galindo
	Diseño de propuesta STEAM: percepción de riesgo de la población de Tuxpan, Nayarit por inundaciones Población de Tuxpan es vulnerable por riesgo de inundaciones y sus percepciones determinan cómo lo enfrentan. El diagnóstico indica bajos niveles de información, planeación y confianza en las autoridades. Se presenta un diseño para esta población, estructurado en el STEAM para informar, sensibilizar, mejorar sus percepciones y habilidades lúdicamente. Presenters: Yadira Delgado Orozco, Cecilia Soraya Shibya Soto, Adriana Fernanda Pérez Vázquez, Alejandra Guadalupe Lizardi Gómez
	Taller de prevención del dengue para niños preescolares neurotípicos con trastornos del neurodesarrollo A través de actividades lúdicas, los niños de preescolar aprenderán a identificar qué es el dengue, el vector que lo transmite, sus síntomas y cómo prevenirlo. El objetivo es proteger su salud de manera accesible, divertida y

	adaptada a sus necesidades, asegurando que todos comprendan la importancia de la prevención. Presenters: Samantha Gheraldi Cárdenas Becerra, Claudia Marlen Tafolla Rodriguez

<table>
<tr><th colspan="2">Concurrent Session D
3:05 PM – 4:05 PM</th></tr>
<tr><td>Location:
Great White

Format:
Interactive Workshop</td><td>Engaging in Science and Engineering Practices Using Rubrics for Self-Reflection and Analysis

Elementary teachers are finding ways to practice literacy skill-building within other school content areas such as science and social studies. As a set of scientific practices rubrics can help teachers evaluate the depth and breadth of the practices included in instruction.

Presenter: Lisa Martin-Hansen</td></tr>
<tr><td>Location:
Tarpon

Format:
Interactive Workshop</td><td>Family Centered Innovations: Improving STEM Education and Servingness Through Student Voices

Participants (scholars, practitioners, community members) will engage deeply in a roundtable discussion with undergraduate STEM students who are leaders of a student-led organization called ALAS (Association of Leaders Advancing Servingness) in topics that may help improve STEM education practices and servingness at the University of Texas Rio Grande Valley.

Presenters: Juan Salinas, Sheila Cardenas Vazquez, Vanessa Rios, Erik Tamez, Karla Vidal, Jeremiah Chavez, Sherlyn De Alva, Jose Mauricio Escobedo</td></tr>
<tr><td rowspan="2">Location:
Marlin

Format:
Research Paper</td><td>Construcción del razonamiento proporcional incorporando tradiciones mexicanas con un enfoque transversal

En este trabajo se busca que los estudiantes construyan su razonamiento proporcional a través de la vinculación de contenidos de matemáticas, química y artes con un enfoque transversal, partiendo de la elaboración de un tapete de Día de Muertos apropiándose de tradiciones mexicanas y fortaleciendo sus habilidades resolutivas y creativas.

Presenters: Luis Alberto Zarate Siordia, Claudio Cesar Díaz González, & Silvia Lizette Ramos de Robles</td></tr>
<tr><td>STEM Students' Stress and Eating Habits

College students have new academic and personal roles. Student’s attitudes and behaviors on eating gets impacted by stress. Students develop interest in the type, taste, and comfort of food that becomes students’ choice and dietary habit.

Presenter: Susheelabai Srinivasa, Sudershan Pasupuleti</td></tr>
</table>

	Is it inquiry? Preservice STEM teachers' attitudes, understanding, and misconceptions about Inquiry-Based Teaching This presentation explores pre-service STEM teachers' attitudes, understanding, and misconceptions about inquiry-based teaching. We will share findings from a study that examined how preservice teachers interpret and implement inquiry-based pedagogical practices and discuss implications for teacher education programs. Presenter: Elizabeth Goldberg
Location: Swordfish Format: Research Paper	*Characteristics of Educational Interventions Aimed at Promoting Attitudes Toward Science in Secondary School Students* This study reviews recent scientific literature on educational interventions designed to foster positive attitudes toward science among secondary students, identifying key components of successful programs. A scoping review of studies from the last decade evaluates intervention characteristics and effectiveness, highlighting the need for further research on impactful program features. Presenters: Noé Manuel García Pérez, Gonzalo Peñaloza Jimenez
	An educational approach to reduce the incidence of kidney disease in children Las personas con Enfermedad Renal Crónica tienen un bajo nivel de alfabetización en salud, asociándose con malos resultados en salud, mayor mortalidad y peor calidad de vida. Se espera identificar distintas propuestas de alfabetización para diseñar un modelo de educación en salud para niños y niñas con daño renal. Presenters: Daniel Flores-Rodriguez, Astrid Campos-Medina
	Standardized Tests Create Learned Helplessness Reducing Stem Motivation There is a troubling lack of student interest in STEM fields, primarily due to a curriculum focused on standardized testing, which contributes to stress, anxiety, and depression, especially among underrepresented minorities, leading to a sense of helplessness. By tackling these issues, there can be a boost in interest in STEM. Presenters: Johnny Salinas, Cassia Guajardo

Concurrent Session E 4:10 PM - 5:10 PM	
Location: Great White Format: Interactive Workshop	*Eduaide.ai* How to make robots do your job. Presenter: Pamela Groves
	Usage of CTMO as a Learning Tool for UTRGV Students We are transforming astronomy education at UTRGV by integrating the CTMO Astronomical Observatory into a hands-on, inquiry-based learning model. Using Karplus's learning cycle and ADDIE, students are engaged in data collection and analysis, enhancing motivation and interest in astronomy through structured, interactive lab experiences. Presenters: Americo Hinojosa, Moises Castillo
Location: Tarpon Format: Research Paper	*Bridging SIOP and STEM using Generative AI for Transformative Learning Pathways: Empowering Emergent Bilingual Students* Discover how SIOP strategies and STEM integration using Generative AI can revolutionize learning for Emergent Bilingual (EB) students. This session equips educators with innovative tools to scaffold STEM content, elevate language development, and inspire inquiry-based learning, creating equitable opportunities for EB learners to thrive in STEM disciplines. Presenters: Ricardo Lumbreras, Jr., Gwinn North

	Unlocking the Language of Math: Strategies for Mastering Word Problems in the Elementary Classroom The mastery of mathematical word problems presents a unique challenge for elementary students, particularly those in grades 3-5, requiring not just computational skills but also reading comprehension and critical thinking abilities. This proposal outlines proven strategies for helping students decode and solve word problems effectively, drawing from 29 years of experience teaching in a diverse school district where many students are learning English as a new language. Presenter: Patricia Egan
	Reimagining Science Education: Engaging Preservice Teachers with a Culturally Sustaining, Health-Centric Curriculum in the RGV This study examined a culturally sustaining, health-focused science curriculum that immersed preservice teachers in real-world health challenges within the Rio Grande Valley. By linking science with students' cultural and community contexts, it equips future educators to nurture meaningful, relevant learning experiences that support health awareness and engagement. Presenter: Miriam Ortiz
Location: Marlin Format: Interactive Workshop	*Code your own story: Digital storytelling is as easy as Elementary* Learning through storytelling is a powerful technique that engages emotions and imagination for learners. It makes information more memorable and relatable for them. Storytelling is beneficial for retention, increased critical thinking and cultural understanding. Early childhood coding allows children to program their own stories in a fun and engaging way. Presenter: Mary J. Payton
Location: Swordfish Format: Showcase	*Beyond Borders: Adaptations and Common Ground for International STEM Learning* Running a STEM program created in the Texas Hill Country in Nairobi, Kenya presents layers of challenges! Join us to learn about the communication and curriculum adaptations needed for the Science Mill to work across geographic and cultural boundaries. Together, can we partner and create STEM without borders? Presenter: Kristi Eschberger, Rebecca Brown

STEM Panel Discussion

Friday, February 14, 2024

5:30 PM – 6:30 PM *Unlocking Potential: STEM Career Options for Every Interest* Panelists: Bethlehem Gronneberg, Daniel Tamez, Claudia Tejeda, Sarah Kennedy Moderator: Bindhu Alappat
6:30 PM – 8:00 PM Poster Session and Social– View poster presentation details on pp. 22-25.

Saturday, February 15, 2025
Day 2
Concurrent Sessions

Concurrent Session F 9:00 AM -10:00 AM	
Location: Great White Format: Research Paper	*Putting an Emphasis on Research and Helping Students Be Successful in Biomedical Science Careers* This proposal focuses on engaging students in hands-on research experiences to develop essential skills for careers in biomedical science. By fostering critical thinking, technical expertise, and professional growth, this approach prepares students to excel as future leaders and innovators in healthcare and science. Presenters: Chun Xu, Daniela Ollervides Charles, Luis Aguillon, Saraswathy Nair, Kesheng Wang, Gladys Maestre
	Insights about Academic Dishonesty and Following Assessment Proctoring Instructions in Two Asynchronous Online Chemistry Courses

	Instructional course design was examined to get students to follow assessment proctoring instructions in two Asynchronous Online Chemistry Courses by applying the lens of Environmental and Personal aspects of Gilbert's Behavior Engineering Model (BEM). Both courses showed good design as all aspects were addressed in at least one way. Presenters: Joanne Rampersad-Ammons
	Upgraded Digital Platforms in Emerging Markets; Standardized Tests Create Learned Helplessness Reducing Stem Motivation Presenter: Esi A. Elliot
Location: Tarpon Format: Interactive Workshop	*Redefining STEM Education Through Sensory-Rich Learning Environments* This session explores the transformation of STEM education through sensory-rich, multimedia-based learning environments that address diverse sensory and cognitive needs. It will discuss the design and practical applications of multimodal STEM curricula that incorporate video, audio, and interactive elements to create engaging, accessible learning experiences for students. Presenters: Martha Lovett, Tracy Ross
	Crack the Code: DNA and RNA Unraveled This 9th-grade Biology lesson focuses on unraveling DNA & RNA concepts. Students' task: identify their true bobcat mascot out of 4 bobcats coming from different locations in the RGV. They'll build a DNA model, explore how DNA determines genotype and phenotype, and discuss which of them is more reliable. Presenters: Madelene Trujillo, Zulema Gallardo
Location: Marlin Format: Interactive Workshop	*AI Meets Differentiation: Empowering Teachers to Engage Students* In this interactive session, participants will explore AI tools like ChatGPT, Brisk, and others, discovering how they streamline instructional design and assessments. Educators will engage in hands-on practice in real-time as well as gain insights from a UTeach alumnus on how AI has been integrated into their classroom. Presenters: Patricia Ramirez-Biondolillo, Omar Elizondo, Omar Moreno
Location: Swordfish Format: Interactive Workshop	*STEAM For All: Empowering Girls Through Science (MX)* Girls from public elementary schools in Monterrey, Mexico experienced a day of hands-on activities to inspire and spark interest in STEM. In teams, students solved physics, chemistry, and math challenges, attended a workshop titled "Understanding and Caring for my Body", and used art to reflect on their specific scientific interests. Presenters: Ada Cecilia Bersoza Hernández, Stefania Laddaga Silvestri
	Green Innovations: Understanding Science Through Recycled Art

	Students in Monterrey, Mexico were asked to use art and recycled materials to better communicate concepts learned in their high school biology courses. In this workshop, we will highlight our student's better creations while inviting participants to try their hand at communicating scientific knowledge through art. Presenters: Jorge Daniel García Garza, Guadalupe Salazar Enríquez, Arturo Tlelo Reyes, Ana Lucía Martínez, Eduardo Lozano Rosciano

Location: Marriott Courtyard Falcon Format: Research Paper	*Exploring CTA and Teachers' Perception on CTCA and PFM for better Student Outcomes in Biology* This study examines the efficacy of Cognitive Task Analysis (CTA) and teachers' perception of Culturo-Techno-Contextual Approach (CTCA) and Paced Flexible Model (PFM) in teaching and learning classification of living things. Findings reveal CTCA's superiority over PFM, enhancing student outcomes through inclusive, culturally responsive, and flexible learning, addressing equity and diversity. Presenters: Oyinloye Deborah Moradeke, Peter Okebukola, Franklin Ufoma Onowugbeda
	Teaching and Learning in STEM: Addresses research that focuses on the way we teach STEM STEM learning aims to develop critical thinking, creativity, and proficiency in children, preparing them for the future challenges. This paper delves into how mothers influence STEM learning during early childhood, focusing on role modelling, encouragement, creating supportive learning environments, engaging in hands-on activities, lifelong learning. Keywords: Children, STEM, Mother, Education. Presenter: Omowunmi Sola Agboola

Concurrent Session G 10:05 AM- 11:05 AM	
Location: Great White Format: Research Paper	*Cultural Heritage in STEAM Education: Advancing Cultural Justice for Critical Pedagogy Among Nepali Teachers* In this paper we present our findings based on a one-day long professional development (PD) conducted in a preK-10 school in Nepal. We present the value of cultural heritage as a context and a matter of cultural justice through evidence from interviews and PD artifacts. Presenters: Bhaskar Upadhyay, Lindsey Smaka, Samantha Baragan
	Project Based STEAM Approach as the Means for Braiding of Indigenous Knowledge and Western Science: Decolonizing Perspectives Presenter: Kamal Prasad Koirala
	Comparative Analysis of Preschool Impacts on Education in Selected Schools in Nigeria

	Pre-school is an institution established for children between two and five years of age as a form of early childhood education introduced to children, to acclimatize them with the learning environment before they are fully registered into the primary section of education in Nigeria. Presenter: Adebiyi Oluwabusayo Folasayo
Location: Tarpon Format: Research Paper	*Exploring the Impact of Afrocyberlibrary and CTCA Integration on Students' Cybersecurity Interest Across Selected Demographics* Per the study's findings, the researchers tentatively recommend incorporating culturally sensitive teaching methods, such as CTCA, alongside digital resources like the Afrocyberlibrary, in educational policy frameworks to democratize cybersecurity education, particularly in underfunded and diverse educational settings prevalent in the global south. Governments and educational institutions should finance developing and expanding inclusive digital tools across diverse socioeconomic and cultural contexts, facilitating equitable access to educational materials. Presenter: Michael Armah
	Designing an online STEM CPD for K12 STEM teachers with a focus on multilingualism and place-based pedagogy This session is aimed to provide an insight into the criticality of designing online stem CPD for K12 stem teachers including bilingual and multilingual teachers using place-based pedagogy as the primary theoretical framework. Presenter: Parama Chaudhuri
	Building Support Systems: Empowering Educators Inclusive Practices for Supporting Students with Disabilities in STEM Classrooms This session explores practical strategies for supporting students with disabilities in STEM education, while offering solutions to prevent teacher burnout through systemic support and professional development. Presenter: Lourdes Yvette Hidalgo
Location: Marlin Format: Interactive Workshop	*CultureSTEM: Nurturing Informal STEM Learning Through Community Wisdom* CultureSTEM is exploring STEM learning in out-of-school contexts for elementary aged children in El Paso and the Rio Grande Valley. Moderator: Miriam Ortiz Presenters: Leslie Garcia, Kimberly Migoya, Samantha Martinez, Layla Gomez Gallegos, Evelyn Ortiz Galarza, Armando Martinez, William Medina-Jerez, Mourat Tchoshanov, Ruby Lynch-Arroyo, Uma Ganesan, Angela Chapman

Location: Swordfish Format: Interactive Workshop	*Art and Science: Rediscovering Creativity Through the Lens of Scientific Methodology* The Arts and Science Award Project (ASAP) enhances scientific literacy in art students by integrating research methodologies into their practice. Through interdisciplinary learning, literature reviews, research writing, and presentations, students develop skills to bridge art and science, fostering innovative approaches and preparing them for academic and professional success. Presenters: Ivan Davila, Volker Quetschke, Romeo Di Loreto
Location: Marriott Courtyard Falcon Format: Research Paper	*How can embracing a cultural mindset significantly improve students' academic success in African cybersecurity education?* Presenter: Olasunkanmi Gbeleyi *Improving students' performance in ICT through virtual learning environment: The impact of Ikpah 1.0* The study examined the effect of virtual learning environment (Ikpah 1.0) on students' academic achievement in ICT in Lagos State Nigeria. Mixed method research design was adopted with a sample size of 173 senior secondary II students drawn from the population. The research instruments were (ICTAT) and (ICTIG). Presenters: Chinyere Eunice Ikpah, Peter Okebukola, Adekunle Oladejo, Deborah Agbanimu


The University of Texas
Rio Grande Valley
Center for Multidisciplinary Research Excellence in Cyber-Physical Infrastructure Systems (MECIS)
UTRGV Center for Multidisciplinary Research Excellence in Cyber-Physical Infrastructure Systems: Training the Next Generation
Dr. Constantine Tarawneh, CREST MECIS Director, accompanies 2 undergraduate and 2 graduate student recipients of the Eisenhower fellowship to the 2023 TRB Conference to present their research in the conference poster session.
TRB ANNUAL MEETING
January 8-12, 2023
Washington, DC
NSF
Award No. 2112650
utrgv.edu/MECIS

<table>
<tr><th colspan="2">Concurrent Session H
11:10 AM - 12:10 PM</th></tr>
<tr><td rowspan="3">Location:
Great White

Format:
Research Paper</td><td>Empowering Handlers in Basic STEM Concepts for Early Years in Rural-Urban Community of Nigeria

Exposing Early Year handlers to basic STEM concepts is vital to the developmental skills in children, as Early Childhood Education lays a solid foundation for holistic learning. Hence the need for regular capacity building programs for teachers especially in rural-urban communities, where there are disparities in accessing quality education.

Presenters: Ibiyinka Ogunlade, OluwatoyinMoyo Odewale</td></tr>
<tr><td>Addressing the Educational and Generational Impact of Assimilation of Migrant Families

This paper explores how assimilation impacts K-12 education of migrant families across generations. The focus is on the integration of equitable curriculum design by including indigenous knowledge, and aims to promote funds of knowledge, creativity, and the academic success in migrant students.

Presenter: Miguel Mendoza</td></tr>
<tr><td>Leveraging a Community of Practice to Advance STEM Education Reform

This study explored the impact of the CREST-MECIS community of practice on K-12 STEM teachers and students, addressing critical challenges in 21st-century science education. Findings demonstrated improved student engagement and teacher efficacy and highlighted the CoP as a replicable model for transforming STEM education through collaboration, inclusivity, and experiential learning.

Presenter: Ruth R. Colyer</td></tr>
<tr><td>Location:
Tarpon

Format:
Interactive Workshop</td><td>Implementing Equitable and Inclusive, Research-Based Instructional Strategies in STEM Education

The NSF-funded project employs a unique combination of research-based change strategies to support STEM faculty members' use of equitable, student-centered instruction in undergraduate STEM courses. Our change strategies and tools, grounded in a novel instructional framework, are designed to maximize impacts and have broad application across STEM disciplines and institutions.

Presenters: Saraswathy Nair, Timothy Huber, Jair Aguilar, Abdurrahman Atesin, Alyssa Cavazos, Sue Anne Chew, Lorena Lopez, Alexis Marquez, Shaghayegh Setayesh, Dustin Van Orman, Daniel Hanley</td></tr>
</table>

Location: Marlin Format: Research Paper	*Cultivating Teacher Identity Through STEAM Cross-Curricular Approaches: Supporting Preservice Teachers at a Hispanic-Serving Institution* This study explored cross-curricular, arts-based, and health-integrated approaches within a Hispanic-Serving Institution's teacher preparation program. By focusing on holistic educational approaches and embedding SEL practices, we nurture preservice teachers' professional identity, confidence, and community. Findings highlight inclusive, culturally sustaining strategies that prepare diverse educators to address student needs holistically. Presenter: Zulema Williams. Miriam Ortiz
	STEMpowerment: Empowering Hispanic Pre-Service Teachers Through Culturally Sustaining Pedagogy Western science's dominance in education marginalizes non-Western ways of knowing, posing challenges for diverse students. We developed a culturally sustaining, problem-based curriculum, centered on indoor farming with culturally significant plants. Analysis of PST and elder reflections revealed insights into cultural knowledge transmission, PSTs' epistemological shifts, and a pedagogy of love. Presenters: Johanna Lynn Esparza, Miriam Ortiz, Uma Ganesan, Angela Chapman
Location: Swordfish Format: Research Paper	*Universal Design for Digital Media Literacy* This session will explore how multimedia shapes our educational environment, and how digital media literacy, critical analysis, and Universal Design Learning, can be used to foster agency, critical thinking, and cultural understanding, by emphasizing the importance of evaluating and contextualizing mass-media in and out of the classroom. Presenter: Nicholas Balderas
	Cognitive Task Analysis and Teachers' Perception of the Impact Of CTCA and TEA 1.0 in Improving Students' Achievement in and Attitude To Cell Division (Mitosis and Meiosis) This study addresses issues in Biology Education in Nigeria by accessing the perception of teachers towards the use of new innovative teaching method to enhance students' achievement and attitude to Cell Division of mitosis and meiosis with integration of cognitive task analysis accessing the thought processes of students and Educators. Presenter: Tibiebi Helen Ege, Peter A. Okebukola, Onuorah Benjamin, John Echo Kargo
	Collaborative Practices in Virtual Group Work on Dynamic Geometry Tasks We investigated students' collaboration on dynamic geometry tasks in online synchronous settings, focusing on social, mathematical, and technological interactions. We identified three collaborative practices

	(drawing in response, co-construction, and real-time writing), which enhanced student engagement in virtual learning environments by facilitating shared communication, collective decision-making, and iterative refinement of ideas. Presenters: Younggon Bae, V. Rani Satyam, Zareen G. Aga

Concurrent Session I 12:15 PM - 1:15 PM	
Location: Great White Format: Interactive Workshop	*Capitalizing on Virtual Learning Environments for Developing Cultural Competence of Professionals Working in Bilingual Communities* Presenters of the multidisciplinary study will showcase pedagogical practice of in-the-moment coaching in a mixed reality simulation (MRS) Mursion™ learning environment for developing cultural competence of future professionals. The session will engage participants in equity-focused discussions surrounding the complexities and intersectionality between culture and language and professional practice. Presenters: Criselda Garcia, Roel Garcia
Location: Tarpon Format: Interactive Workshop	*Observing Mathematics Teaching Practices for All Students' Success* This workshop introduces an instrument designed to evaluate mathematical task characteristics and its implementation effectiveness. Participants will be engaged with, and practice using the teacher observation tool to enhance their instructional practices and improve their student's mathematics achievement through a systematic task analysis and reflection. Presenters: Jair J. Aguilar, James Telese
Location: Marlin Format: Research Paper	*Active Learning for STEM Educators in an HSI* This study was an innovative attempt to UTRGV STEM faculty to examine their teaching philosophy and course syllabi via the examination of the Bloom's taxonomy levels. We reviewed some insights regarding STEM faculty course designs while they have been improved to be more active learning-based courses. Presenter: Pierre Lu, Jing Jie Tea
Location: Swordfish Format: Interactive Workshop	*Wild at Heart: Kids in Nature* An engaging, interactive workshop where children ages 6-10 explore the wonders of wildlife through hands-on activities from the Project WILD curriculum. Participants will connect with nature, learn about animals and ecosystems, and create take-home crafts inspired by their discoveries. Fun, educational, and nature-filled! Presenters: Patricia Ramirez-Biondolillo, Uma Ganesan, Miriam Ortiz

Poster Session – Regular

Friday, February 14, 2024

6:30 PM – 8:00 PM

Location: Grand Ballroom

Adaptive Foraging Algorithms for Robotic Swarms: Leveraging Machine Learning to Minimize Collision and Maximize Collection

This proposal aims to enhance efficiency in robotic swarm foraging, focusing on maximizing resource collection while minimizing collision and overall congestion rates. Current algorithms show promise but struggle to maintain efficiency as swarm sizes increase. In this study, we propose an algorithm to optimize current foraging behavior.

Presenters: Arturo Gonzalez, Rodrigo Torres-Mora, Qi Lu

Advancements in Rail Safety: AI-Driven Hazard Detection at Grade Crossings

This poster outlines a study on using AI and deep learning to detect hazards at rail grade crossings. It presents data collection, labeling, training processes, and results demonstrating improved safety measures through AI-driven technology, supported by the University Transportation Center for Railway Safety.

Presenters: Felix Chavez, Grasser Ali, Constantine Tarawneh

Affective Autonomous Mobility via Human-Computer Interaction: Facial and EEG Emotion Recognition in CARLA

The motivation behind emotion recognition is to provide a more natural and intuitive way for vehicles to interact with their human drivers by understanding their emotions. By recognizing facial expressions and neural activity, cars can respond to the driver's state of mind in real-time, providing more personalized, safe driving experience.

Presenters: Teresa Garza, Ayleen Jimenez, Leonel Ramirez, Fatemeh Nazari, Mohamadhossien Noruzoliaee

Autonomous Train Maintenance: Predictive Machine Learning Model for Remaining Bearing Mileage

This project leverages the powerful tool of machine learning (ML) that retrieves processed data by onboard bearing sensors to forecast the remaining mileage of a bearing based on its historical performance, creating a proactive solution to railway safety.

Presenters: Elian Alexis Cantu, Diego Cantu, Constantine Tarawneh, Heinrich Foltz, Ping Xu

Comparative Analysis and Enhancement of Bug Algorithms for Obstacle Avoidance

This presentation focuses on the evaluation of traditional Bug Algorithms for obstacle avoidance in robotic systems and introduces a newly developed enhanced algorithm. To be tested alongside

established algorithms, the new approach aims to demonstrate superior efficiency and effectiveness in navigating dynamic environments.

Presenters: Qi Lu, Izabella Valero

Cybersecurity of AI-powered traffic signal control

Transportation networks are vulnerable to cyber threats, risking disruptions. Reinforcement learning (RL), used for optimization, is intrinsically susceptible to attacks. A proposed defense model employs RL to develop a robust adversarial policy, enhancing resilience and reliability in AI-driven traffic control amid cybersecurity threats.

Presenters: Mark Hernandez, Mohamadhossein Noruzoliaee

Development and Testing of a Prototype Erbium-Doped Lithium Tantalate Based Sensor for Infrastructure Crack Detection

The development of a novel sensor for detecting and characterizing cracks in infrastructure, particularly suited for deployment on Unmanned Aerial Vehicles (UAVs), is presented. The sensor utilizes a sophisticated setup involving laser triangulation, focusing on leveraging Erbium-doped Lithium Tantalate nanoparticles. This presents significant steps forward in advancing infrastructure health monitoring.

Presenters: Alejandro Barrera, Constantine Tarawneh, Farid Ahmed

Development of Boron Nitride-Based Composites for Enhanced Gas Sensing Applications.

We present a combined computational and experimental work on defect-modified hexagonal boron nitride(h-BN) monolayers for CO gas detection applications. Using Density Functional Theory (DFT), we calculated the electronic and optical properties of defect h-BN to predict its response to CO adsorption.

Presenters: Andrea Pelayo Carvajal, C. Sauceda, A. Villarreal, M.A Hobosyan, and N. Dimakis

Drone Position and Attitude Estimation with Camera Vision and Neural Network Model

Drone Usage Drones are versatile robots with a wide range of applications. They can be used for tasks like package delivery to search and rescue missions. Current Drawbacks Most UAV's use GPS navigation GPS connection can be interrupted in several situations: Urban areas Near geological barriers Jammed in military zones.

Presenters: Wenjie Dong, Jose Rodriguez

Drones in Industry and Workforce Development

This research explores the integration of drones into various industries, highlighting the impact on workforce demands and the need for STEM education to align with these trends. By introducing the market need for drones and robotic systems, educational institutions can offer a curriculum which teaches students of rising technology.

Presenters: Javier Becerril, Diego Gutierrez, Qi Lu

Effects of District Funding Disparities on Student Motivation for College in the Rio Grande Valley

This study examines how socioeconomic disparities among school districts impact student motivation for college in the Rio Grande Valley. Findings reveal that economic disadvantage and district resources significantly affect students' educational aspirations. This emphasizes the need for equitable support to enhance college readiness in underserved communities.

Presenters: Ronald Shaju, Alyssa Sepulveda, Yolanda Gutierrez, Alivia Shaju, Melissa Cruz, Sophia Moon, Juan Lopez Alvarenga

Examining the Intersectional Impact of Culturally Responsive Children's Literature on Students' Understanding of Scientific Phenomena

This paper explores how teachers can use children's books to make science come alive for students while nurturing their awareness of social justice. By thoughtfully selecting books that reflect diverse experiences and observable scientific phenomena, teachers can create engaging lessons that make science relevant and accessible to all students.

Presenter: Misty Heredia

Feature Extraction from Vibration Signatures Acquired from Railroad Bearing Onboard Condition Monitoring Sensors

The Railway Industry Faces approximately 1,000 train derailments annually. This project strives to develop AI/ML algorithms to predict the speed of railway cars using vibrational data collected by the University Transportation Center for Railway Safety (UTCRS) onboard sensors.

Presenters: Diego Cantu, Constantine Tarawneh, Heinrich Foltz, Ping Xu

French Scientists who Made Science Popular

This is an overview of the Famous French and Francophone scientists and their activity that contributed historically to popularizing science in schools and across disciplines. The posters will be created by college students and proposed also to high schools for students grades 9-12.

Presenter: Irina Armianu

Human-Centric Smart Cities: A Digital Twin-Oriented Design of Interactive Autonomous Vehicles

Develop a comprehensive perception system featuring a semantic segmentation model for autonomous vehicles (AVs) to contribute to a safer, more efficient, and sustainable future. Motivation Improving road safety. Transforming transportation. Increase traffic efficiency. Focus on perception and semantic segmentation.

Presenters: Oscar De Leon Vazquez, Leonel Ramirez, Fatemeh Nazari, Mohamadhossein Noruzoliaee, Mario Camarena

Hurricane Development & Intensification: Analyzing Ocean Temperature, Pressure & Wind Speeds Across Three Basins

This research investigates ocean temperature, atmospheric pressure, and wind speed correlations on hurricane development/intensification across three basins. In examining geographic trends, climate

change effects, and conditions influencing hurricane speed, size, and peak intensity, this study aims to better understand why hurricanes vary in development rate/size even within the same category.

Presenter: Madelene Trujillo

Interactive Autonomous Vehicles: Developing autonomous vehicle control with reinforcement learning, utilizing human facial emotion input

Presenters: Timothy Lyons, Mohamadhossein Noruzoliaee, Fatemeh Nazari, Oziel Sauceda

Measuring teaching behaviors for student engagement based on machine learning algorithm: Preliminary study

This study seeks an innovative way to calibrate teaching quality by analyzing teaching behaviors with deep learning supported by Artificial Intelligence (AI) from a multidisciplinary approach based on cognitive theories. An AI-driven system calibrates teaching quality by analyzing teachers' behaviors that help students deeply engage in learning.

Presenters: Seokmin Kang, Erik Enriquez, Dongchul Kim, Sungyeun Kim

Optimizing Lightweight UAV Structures Through Hybrid Material Integration for Enhancing Payload Capacity and Flight Performance

This project aims to develop a hybrid lightweight, optimized drone using generative design, topology optimization, and other techniques. UAV aims to carry sensors and equipment to detect infrastructure hazards and enhance safety while reducing cost and labor.

Presenters: Constantine Tarawneh, Farid Ahmed, Darren Espinoza

Optimizing NeuroEvolution of Augmented Topologies (NEAT) in Swarm Robotic Foraging through Penalty-Reward Systems

This presentation explores the application of NeuroEvolution of Augmented Topologies (NEAT) enhanced with a penalty-reward system for swarm robotic foraging tasks, focusing on optimizing agent coordination, resource retrieval, and adaptability.

Presenters: Pigar Biteng, Eric Rodriguez, Qi Lu, Tameem Uz Zaman

Preliminary Vibration Analysis on Crack Detection Sensor for Drone Integration

This project explores vibration mitigation in drone-based crack detection sensors for structural health monitoring. A setup simulates drone operation to analyze sensor accuracy across various vibration levels, crack sizes, and speeds. Findings aim to optimize sensor performance, enabling reliable, real-time infrastructure monitoring and enhancing public safety through early crack detection.

Presenters: Anahi Hernandez, Constantine Tarawneh, Farid Ahmed

Teacher Narratives in Place-Based Science Education: Insights from the Trans-Nueces Region

This study explores teacher narratives from a place-based science program in the Trans-Nueces region, examining how educators integrate local environmental contexts into their teaching practice.

The research provides insights into implementing place-based education principles while bridging the gap between theoretical frameworks and classroom practice.

Presenter: Brian C. Gabrysch

JSTEM POSTER PRESENTATIONS

Concurrent C

2:00 PM -3:00 PM

Location: Great White

How Glucose Concentration Affects Proliferation of MDA-MB-231 Breast Cancer Cells

According to the existing research, cancer cells will experience the Warburg effect in which cancer cells produce ATP biased towards glycolysis rather than mitochondrial oxidative phosphorylation.

Presenters: Vanessa Dominguez, Danna Gaytan, Alma Cabrera, Luis Fernandez

Investigation Of Ocean Microorganisms in Modern Medicine

Do antibiotics found in the Gulf of Mexico demonstrate antimicrobial resistance or susceptibility, how are they classified, and what other beneficial or harmful effect may they have? We hypothesized that we would find mild antimicrobial resistance in one or more of the isolated strains and that several of the strains may carry medicinal properties. To perform the experiment, we first isolated certain microorganisms up to three generations using spread and streak methods. Then, we gram stained six of the isolated microorganisms and performed a Kirby-Bauer test to measure antimicrobial resistance through the formation of a zone of inhibition. Next, we did DNA Sequencing on 7 microorganisms for more exact identification in addition to the use of a dichotomous key and coagulase and catalase tests.

Presenters: Elisa Martinez, Hennessy Rodriguez, Matthew Reyna, Sophia Morrison

Investigation of The Effects of Music on Brain Cancer Cells

Brain cancer is a serious health issue. We hypothesized that if cells are exposed to music, then the proliferation of brain cancer cells will slow down. We found that brain cancer exposed to relaxing music grew faster compared to heavy metal. We chose this topic to better understand the effects of music on cancer cells.

Presenters: Nelly Contreras, Margarita Villasana, Jose Moreno, Wendy Villalobos

R's Metals

Ferric (II) oxide (Fe_2O_3) is a substance that is released when corrosion occurs in a metal. This corrosion is a redox reaction that occurs when water, oxygen, and iron interact and exchange electrons. This exchange in electrons causes the formation of Fe_2O_3. The effects of Fe_2O_3 may cause the collapse of iron structures that may contribute to contamination to the environment. The effects of Fe_2O_3 when inhaled may cause metal fume fever. Metal fume fever may cause dizziness, vomiting, and respiratory complications.

Presenters: Ariel Alonso, Ivan Gomez, Diego Herrera, Juan Vasquez

The Effect of Different Glucose Concentrations on Telomere Length in Yeast

Unbeknownst to many, telomeres play a vital role in regulating cell division and preventing premature age-related diseases such as Alzheimer's, hypertension, and cancer. Unlike other segments in DNA on

chromosomes, telomeres are found at the tips with high concentrations of nitrogenous base pairings of Guanine and Cytosine that become reduced with age due to mitosis. This shortening of chromosomal length becomes detrimental if it happens at an abnormal rate within a short time lapse in the organism's life span. With this in mind, our goal was to explore the potential effects of diabetes (high glucose concentration) on C. cerevisiae telomere length. Yeast was used as a model organism to see its reaction to stimuli due to its similar nature to human cells since both are eukaryotic. Not only does yeast prove to share a comparable genomic structure to that of human cells, but it's also able to undergo cellular division at a faster rate. Our hope was to identify any trends in the data collected and offer explanations for the nature of the results. Perhaps after close examination, we may be able to determine whether high glucose concentration in cells is the result or mere correlation of telomere shortening.

Presenters: Amy Dominguez, Suleidy Zuniga, Aimmy Zuniga

The Effects Of 3 Herbs on Breast Cancer Cells

The purpose of this project is to analyze what effect the herbs we're using for this project will take on the breast cancer cells (this concludes a 1%, 10% and a 30% of each herb) and in which the herb could either be killing the cancer cells, decreasing the growth of them, increases the division of the cancer cells, or were just feeding them. The main motive of this is to show *the fact* that back in the years medicine wasn't as advanced as it is now, in the 2000's. And the lack of medicine and treatments were the death of many of our people, meanwhile now in the 2000's death rates have progressively gone down because of the evolution of medicine many have gotten treatment to deadly diseases.

Presenters: Miranda Salas-Hilario, Nylin Alonzo, Desteny Rodriguez

CLOSING SESSION

Location: Grand Ballroom	Highlights, recognitions, and Disruptor Award presentation Presenter: Angela Chapman

List of Presenters

Abdurrahman Atesin
Ada Cecilia Bersoza Hernández
Adebiyi Oluwabusayo Folasayo
Adekunle A. Oladejo
Adeniran Itunuoluwa Adewumi
Adrian Eduardo Castañeda Ochoa
Adriana Fernanda Pérez Vázquez
Aimmy Zuniga
Alejandra Guadalupe Lizardi Gómez
Alejandro Barrera
Alejandro Gallard Martinez
Alexis Marquez
Alivia Shaju
Alli Olawale Abdurrazaq
Alma Adrianna Gómez Galindo
Alma Cabrera
Alyssa Cavazos
Alyssa Sepulveda
Americo Hinojosa
Amy A. Weimer
Amy Dominguez
Ana Lucía Martínez
Anahi Hernandez
Andrea Pelayo Carvajal
Andrew Tetteh
Angela Chapman
Ariel Alonso
Armando Villarreal
Arturo Gonzalez
Arturo Tlelo Reyes
Astrid Campos-Medina
Ayleen Jimenez
Benjamin Onuorah
Bethlehem Gronneberg
Bhaskar Upadhyay
Brian C Gabrysch
Brooke Rudeloff
C. Sauceda
Carolyn Chang
Cassia Guajardo
Cecilia Soraya Shibya Soto
Chinyere Eunice Ikpah
Chun Xu
Claudia Marlen Tafolla Rodriguez
Claudio Cesar Díaz González
Constantine Tarawneh
Criselda Garcia
Daniel Flores-Rodriguez
Daniel Hanley
Daniela Ollervides Charles
Danna Gaytan
Darren Espinoza
Deborah O. Agbanimu
Desteny Rodriguez
Diana Aideé Ortega Ríos
Diego Cantu
Diego Gutierrez
Diego Herrera
Dongchul Kim
Dustin Van Orman
Eduardo Lozano Rosciano
Ege Tibiebe Helen
Eleazar Marquez
Elian Alexis Cantu
Eliazar Trevino
Elisa Martinez

List of Presenters

Elizabeth Goldberg
Emily Suh
Eric Rodriguez
Erik Enriquez
Erik Tamez
Esi A. Elliot
Farid Ahmed
Fatemeh Nazari
Felicia Nkrumah
Franklin Ufoma Onowugbeda
Georgina Eberechi Chris-Kalu
Gladys Maestre
Gonzalo Peñaloza Jimenez
Guadalupe Salazar Enríquez
Gwinn North
Hakeem Akintoye
Hakeen Akintoye
Hassan Nusirat Adebukola
Heinrich Foltz
Hennessy Rodriguez
Ibiyinka Ogunlade
Ibukunolu Ademola
Ilse Denisse Sánchez Jiménez
Irasema Gonzalez
Irina Armianu
Isabel Amaro
Ishaq Jamal O.
Ivan Davila
Ivan Gomez
Izabella Valero
Jair Aguilar
James Telese
Javier Becerril
Javier Ortega
Jean McLaughlin
Jeffery Aquino
Jeremiah Chavez
Jing Jie Tea
Joanne Rampersad-Ammons
Johanna Lynn Esparza
John Echo Kargo
John Iyk Ogonenwe
Johnny Salinas
Jorge Daniel García Garza
Jose Mauricio Escobedo
Jose Moreno
Jose Rodriguez
Joshua Akinpelu
Joshua Reyna
Joy Olayemi
Juan Lopez Alvarenga
Juan Salinas
Juan Vasquez
Julia Cuevas
Juma Shabani
Kamal Prasad Koirala
Karin Lewis
Karla Vidal
Kesheng Wang
Kristi Eschberger
Leonel Ramirez
Lindsey Smaka
Lisa Martin-Hansen
Lluvia Garcia
Lorena Lopez
Lourdes Yvette Hidalgo

List of Presenters

Luis Aguillon
Luis Alberto Zarate Siordia
Luis Fernandez
M.A Hobosyan
Madelene Trujillo
Margarita Villasana
Mariana Alejandra Beltrán Díaz
Mario Camarena
Mark Anthony Piñon
Mark Hernandez
Martha Lovett
Mary J. Payton
Matilde Alanis
Matthew Reyna
Megan Keniry
Melissa Cruz
Michael Ahove
Michael Armah
Miguel Mendoza
Milagros de Jesús Cázares Balderas
Miranda Salas-Hilario
Miriam Ortiz
Misty Heredia
Mohamadhossein Noruzoliaee
Moises Castillo
Mourat Tchoshanov
Nelly Contreras
Nicholas Balderas
Nicholas Dimakis
Nicholas Weimer
Noé Manuel García Pérez
Noe Vargas
Nylin Alonzo
Oladipupo Oluwadamilola Rebecca
Olasunkanmi Gbeleyi
OluwatoyinMoyo Odewale
Omar Elizondo
Omar Moreno
Omowunmi Sola Agboola
Onuorah Benjamin
Onuorah Benjamin
Oscar De Leon Vazquez
Oyinloye Deborah Moradeke
Oyinloye Lydia Moradeyo
Oziel Sauceda
Pamela Groves
Parama Chaudhuri
Patricia Egan
Patricia Ramirez-Biondolillo
Peter A. Okebukola
Pierre Lu
Pigar Biteng
Ping Xu
Qi Lu
Rahman Tunde
Rasheed Sanni
Rebecca Brown
Ricardo Lumbreras
Roció Mayela Quevedo Huerta
Rodrigo Torres-Mora

List of Presenters

Roel Garcia
Romeo Di Loreto
Ronald Shaju
Rosaura Méndez González
Roxana Jimenez
Ruby Lynch-Arroyo
Ruth R. Colyer
Samantha Baragan
Samantha Gheraldi Cárdenas Becerra
Saraswathy Nair
Seokmin Kang
Shaghayegh Setayesh
Sheila Cardenas Vazquez
Sherlyn De Alva
Silvia Eduviges Hinojosa Rizo Docente
Silvia Lizette Ramos de Robles
Sofia Karina Vázquez Gómez
Sophia Moon
Sophia Morrison
Stefania Laddaga Silvestri
Stephanie Briggs
Sudershan Pasupuleti
Sue Anne Chew
Suleidy Zuniga
Sungyeun Kim
Susheelabai Srinivasa
Tameem Uz Zaman
Teresa Garza
Tibiebi Helen Ege
Timothy Huber
Timothy Lyons
Tracy Ross
Uchenna Ugwuoke
Uma Ganesan
V. Rani Satyam
Vanessa Dominguez
Vanessa Rios
Vejoya Viren
Victor Hernandez
Volker Quetschke
Wendy Villalobos
Wenjie Dong
William Medina-Jerez
Yadira Delgado Orozco
Yashwant Singh Katailiha
Yolanda Gutierrez
Younggon Bae
Zareen G. Aga
Zulema Gallardo
Zulema Williams

Notes

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