15th Annual
Scholarly Activity and Research Program (SARP) Spring Symposium

April 8th 2025 8:00 AM -
5:00 PM
MEB Lobby/WebEx

2025 SARP Spring Symposium Schedule & Abstracts

SARP team:

- Dr. Jessica Chacon (Faculty Course Director)
- Dr. Nathan Holland (Faculty Course Director)
- Dr. Sheralyn Sanchez (Program Director)
- Mr. Michael Mercado (Unit Associate Director)

Special thanks to all the judges, timekeepers and support staff for their help and dedication to our students, and to all the students and their mentors for their hard work and scholarship.

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2025 SARP SPRING SYMPOSIUM

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ABSTRACTS

April 8
8:00 a.m. – 12:00 p.m.

Name: Andrade, Jose
Classification: Y2
Project Title: The correlation between health outcomes of Hispanic acute myeloid leukemia (AML) patients and their blood lipid parameter levels
Mentor: Dr. Anna Eiring, The University of Texas at El Paso
Group 1
8:00AM

Abstract:

Acute Myeloid Leukemia (AML) presents significant health disparities among Hispanic populations, who experience higher prevalence, earlier onset, and poorer outcomes. This study examines the correlation between blood lipid parameters (total cholesterol and triglycerides) and AML outcomes in Hispanic patients, hypothesizing that lipid levels may influence remission rates and quality of life. Using data from the **All of Us Research Database**, 40 Hispanic AML patients were analyzed, divided into two groups: those with high lipid levels and those with normal levels.
Statistical analysis using a **chi-squared test for independence** found **no significant correlation** between lipid levels and remission status ($p = 0.507$) or self-reported quality of life ($p = 0.420$). These findings suggest that, despite prior evidence linking lipid metabolism to leukemia progression, lipid levels may not serve as predictive biomarkers for AML outcomes in Hispanic patients.
Limitations include **small sample size, reliance on self-reported data, and lack of genetic and treatment variation control**. While the hypothesis was not supported, this research contributes to understanding Hispanic AML health disparities. Future studies should use **larger cohorts and genomic analysis** to explore alternative factors influencing AML prognosis in Hispanic patients.

2025 SARP SPRING SYMPOSIUM

Name: Cortes, Damaris
Classification: Y2
Project Title: Analysis of age of autism diagnosis and behavioral treatment in children ages 3-17 years
Mentor: Dr. Sarah L. Martin
Group 1
8:30AM

Abstract:

Autism spectrum disorder (ASD) is a neurodevelopmental condition that manifests with difficulties in social interactions and restrictive or repetitive behaviors. Despite the availability of different screening tools, families still experience delays in obtaining an official ASD diagnosis. There are several factors that contribute to these delays such as co-current conditions, limitations of clinical methods, and sociodemographic factors. The literature also reveals that there are differences between the age of diagnosis across different racial and ethnic groups, where Black and Hispanic children experience significant delays compared to their White counterparts. Our study used public data available from the National Survey of Children's Health (NSCH) for the years 2021-2022. Logistic regression was used to analyze data modeling whether a child who currently has ASD received behavioral treatment. Predictors in the statistical model included age of diagnosis, race, sex, level of parent education, health insurance coverage, and federal poverty level. No significant difference was found between other races and non-Hispanic White. Age of diagnosis was found to have a significant association. The younger a child was diagnosed, the more likely he/she received treatment during the past 12 months ($p < 0.0001$). Timeliness of diagnosis has implications for access to early intervention that may improve developmental outcomes for children. Further analysis of disparities can help improve current services to provide more equitable care.

2025 SARP SPRING SYMPOSIUM

Name: Diaz, Daniela
Classification: Y2
Project Title: Parity Alters the Expression of Genes Involved in Stemness of the Mammary Gland
Mentor: Dr. Rajkumar Lakshmanaswamy
Group 1
9:00AM

Abstract:
Introduction: Breast cancer is the most prevalent cancer among women globally, with an estimated 2.3 million cases and 670,000 deaths annually. Approximately two-thirds of all breast cancers diagnosed are classified as hormone dependent, which indicates that hormones play key roles in the growth of these breast cancers. It is well known that pregnancy at a young age decreases the risk of breast cancer. Women who have children before the age of 20 have a 50% reduction in lifetime breast cancer risk compared to women who do not have children. The exact molecular mechanisms of parity-induced protection against breast cancer are not well understood, but the hormonal environment is believed to play a role. Short term treatment with pregnancy levels of estrogen and progesterone have been shown to have a protective effect against mammary tumors in rodents. Knowing this, it is important to understand the underlying mechanism of this protection to be able to translate these findings into clinical applications.
Materials and Methods: Previously collected nulliparous and parous rat mammary tissue samples were used to conduct the experiments. The Rat Cancer Stem Cell RT² Profiler™ PCR Array (Qiagen) was used to analyze the differential expression of genes between nulliparous and parous mammary glands. The differentially expressed genes were then analyzed using TCGA database through UALCAN. Western blot, immunofluorescence, and immunohistochemistry analysis was performed to analyze protein expression of BCL2, Cyclin D1, CDK4, pAKT, pERK1/2, and ALDH1A.
Results: From our RT PCR results we observed differential expression of genes in the mammary gland of parous compared to nulliparous rats. The genes that were downregulated in parous rat tissue were ABCB5, BMI1, BMP7, CHEK1, and EPCAM. The genes that were upregulated in parous rat tissue were DNMT1, ENG, GATA4, GSK3B, PTCH1. Protein analysis demonstrated downregulation of BCL2, Cyclin D1, CDK4, pAKT, pERK1/2, and ALDH1A.
Conclusion: Parity induces differential gene expression in mammary glands, which could help us understand the mechanisms by which parity reduces the risk of breast cancer.

2025 SARP SPRING SYMPOSIUM

Name: Ezhil, Vikram
Classification: Y2
Project Title: A Deep Learning Approach To Laryngeal Motion Tracking Under Partial Occlusion In Rats
Mentor: Robert A. Morrison, PhD, UT Dallas
Group 1
9:30AM

Abstract:
Development of an automated deep learning model for tracking vocal fold motion, reducing subjective variability in laryngeal assessments. Trained on rat model videos pre- and post-unilateral RLN transection, it effectively detects partial and complete motion loss, even with visual occlusions. It aligns well with clinician ratings, offering a robust tool for quantitative vocal fold analysis in clinical and research settings.

2025 SARP SPRING SYMPOSIUM

Name: Guo, Crystal
Classification: Y2
Project Title: An Analysis of Risk Factors for Elder Mistreatment that can be Modified by Hospital Game Plan4Care
Mentor: Molly Horstman, M.D., M.S., Baylor College of Medicine
Group 1
10:00AM

Abstract:
Mistreatment of an older adult is a pervasive health care problem that is often overlooked by physician and society. One in 10 adults over the age of 60 will report experiencing some form of abuse or neglect in the past year3. Mistreatment experienced by older adults include physical abuse as well as financial abuse, psychological or emotional abuse, sexual abuse, or neglect1. Mistreatment can be difficult to diagnose due to the multitude of medical conditions that are already experienced by older adults. Diagnoses of mistreatment depend heavily on obtaining a comprehensive history and thorough physician exam, all of which can be missed if providers are not routinely assessing for risk factors for mistreatment of an older adult4. Mistreatment is also underreported because caregivers and older adults may be reluctant to report incidences of mistreatment when mistreatment is suspected4.

Screening for mistreatment and neglect among older adults relies on a cognitive assessment through one-on-one interviews and physical exam. This can be difficult to complete if the older adult is cognitively impaired or incurs injuries secondary to an existing medical condition2. Current screening tools may assist providers in detecting elder mistreatment if suspicions arise. However, many health providers require more education in detecting and managing elder mistreatment for screening tools to be beneficial7. In addition, it is unknown if screening for mistreatment has any impact in reducing incidences of mistreatment and neglect in older adults. Screening alone will never be sufficient if it is not coupled with evidence-based interventions that reduce the incidence of mistreatment and neglect among older adults5. Caregiver focused interventions have shown success in reducing mistreatment of older adults, especially those with complicated chronic illnesses5. Hospital GamePlan4Care (HGP4C) is a multi-component caregiver support program delivered to caregivers of hospitalized adults with dementia. HGP4C is an adaptation of REACH II (Resources for Enhancing Alzheimer's Caregiver Health II), which is an evidence-based caregiver intervention that reduces caregiver depression and relieves caregiver burdens6. HGP4C combined the REACH II protocol of individualized support sessions with caregiver education to help caregivers transitioning individuals with dementia from hospital stay to out-of-hospital care. Although Hospital GamPlan4Care is designed to improve caregiver well-being, it has not been tested as an intervention to reduce elder abuse and mistreatment.

2025 SARP SPRING SYMPOSIUM

Name: Kulkarni, Aditi
Classification: Y2
Project Title: The Role of MicroRNA-501-3p in Alzheimer's Disease
Mentor: Dr. Subodh Kumar
Group 1
10:30AM

Abstract:
Alzheimer's Disease (AD) is an insidious and progressive neurodegenerative disorder leading to dementia, memory loss, and functional decline. There is currently no cure for AD, underscoring the need for early detection and disease monitoring. This work aims to ascertain the potential biomarker role of microRNA (miRNA), small non-coding RNA sequences that regulate a wide variety of human diseases, in AD pathogenesis and detection. Specifically, miRNA-501-3p expression was assessed in AD patients and healthy controls in both central (post-mortem brain and cerebrospinal fluid) and peripheral (blood serum, B-lymphocytes, and fibroblasts) samples to determine whether there was a significant ($p<0.05$) change in miRNA-501-3p levels correlating to disease presence and severity. MiRNA-501-3p expression was analyzed using exosome isolation (for blood serum and cerebrospinal fluid samples), RNA isolation, poly-adenylation/cDNA synthesis, and subsequent qRT-PCR. MiRNA-501-3p was significantly upregulated in post-mortem brain samples ($p<0.0001$) and cerebrospinal fluid samples ($p<0.037$) of AD patients compared to healthy controls. Blood serum samples were further stratified into healthy controls, mild cognitive impairment (MCI; less severe), and AD (most severe) subgroups. MiRNA-501-3p was significantly upregulated in all group comparisons except between mild cognitive impairment and AD ($p=0.48$). Lastly, insignificant changes were observed in miRNA-501-3p expression levels in fibroblasts and B-lymphocytes from AD patients versus healthy controls. These findings suggest that miRNA-501-3p may serve as a promising biomarker in post-mortem brain, cerebrospinal fluid, and blood serum samples with potential implications for future AD detection, monitoring, and therapeutics.

2025 SARP SPRING SYMPOSIUM

Name: Lara, Miguel
Classification: Y2
Project Title: Gedunin Inhibition in Triple-Negative Breast Cancers through Sonic Hedgehog Signaling.
Mentor: Dr. Rajkumar Lakshmanaswamy
Group 1
11:00AM

Abstract:

Due to novel compounds are studied to identify a pathway that bridges therapeutics. Triple-negative breast cancer is a cancer subtype with the highest prevalence among women, yet conventional treatment remains lacking. This study focuses on Gedunin, a phytochemical obtained from Azradirachta indica neem tree leaves, to evaluate its effects on TNBC. This compound inhibits the Sonic Hedgehog (SHH) pathway, a key mechanism for cancer cell development. Previous compounds have been shown to slow cancer progression and metastasis by inhibiting this stem cell regulatory pathway; however, these studies employed other cell lines. This experiment analyzes how Gedunin affects the SHH pathway in the TNBC cell lines MDA MB 231 and MDA MB 468. First, cell viability assays were performed to determine the IC50 for each cell line. GLI1, SHH, and CASP6 proteins of particular interest within the SHH were assessed through immunofluorescence for qualitative gene expression analysis. Notably, microplate PCR arrays of the SHH pathway yielded results that highlight the importance of additional research on this pathway.

2025 SARP SPRING SYMPOSIUM

Name: Lara, Daniel
Classification: Y2
Project Title: The characterization of Nimbolide IC50 on MDA MB-231 and BT-20 regarding the PI3K-AKT and MAPK pathways
Mentor: Dr. Rajkumar Lakshmanaswamy
Group 1
11:30AM

Abstract:

The phytochemical Nimbolide exerts anticancer properties for elucidating key genes involved in PI3K-AKT and MAPK pathways in Triple Negative Breast Cancer (TNBC). The genes involved in these pathways are PI3K, AKT, RAS, and RAF, which affect downstream effectors such as ERK, AP, FOS, and JUN, thus producing chemoresistance. The MDA MB-231 and BT-20 cancer cell lines were treated with 7.5micromolar Nimbolide overnight and when the cells reached 80% confluency. The genes mentioned were analyzed through RT2PCR for upregulation or downregulation. The primary antibodies for immunofluorescence were the P-PI3K and P-MAPK (p-ERK1/2), considering Nimbolide IC50. The gene FOS was upregulated for both cell lines, while JUN was only for the BT-20 cell line. The downregulated genes were PI3K, AKT, RAS, and RAF. Notably, the exceptions in downregulation were PIK3CG for BT-20 and PIK3R1 for MDA MB-231. The qualitative aspect of immunofluorescence indicated more intensity for the MDA MD-231 treatment group for P-PI3K than the control group. The intensity for p-ERK1/2 was the same for both groups. The BT-20 cell line had the same intensity for both primary antibodies among treatment and control groups. In the future of this research, replication, and duplicate are suggested to reduce the margin error for RT2PCR analysis. Regarding immunofluorescence, an improvement in the technical aspect is required to ensure the resolution of images and consistency in intensity. The Nimbolide IC50 effected downregulation in upstream genes in both cell lines, further replicates will demonstrate its efficacy

2025 SARP SPRING SYMPOSIUM

Name: Lee, Spencer
Classification: Y2
Project Title: Investigating the association of intraoperative aminocaproic acid administration with electrographic markers of seizure risk in the cardiothoracic ICU
Mentor: Seyed A. Safavynia, MD, PhD, Weill Cornell Medicine
Group 2
8:00AM

Abstract:

Aminocaproic acid is an antifibrinolytic drug used perioperatively to decrease patients' risk of hemorrhage-associated mortality. Its chemical structure also allows it to act as a competitive antagonist at gamma-aminobutyric acid and glycine receptors. The resulting decrease in inhibitory neurotransmission is theorized to increase the likelihood of erroneous neuronal activity, including seizures.

This study was conducted to investigate the relationship between intraoperative aminocaproic acid administration and electrographic markers of seizure risk. Electronic medical records were obtained for patients admitted to the cardiothoracic intensive care unit at New York Presbyterian Hospital between the dates of January 1st, 2015, and June 1st, 2024 (excluding admissions during 2020) with electroencephalographic recordings during their admission. Aminocaproic acid administration was the primary exposure variable, and electrographic markers of cortical hyperexcitability and electrographic seizure were the outcome variables measured. Data were analyzed using a two-tailed Student's t-test, Fisher's exact test, univariate logistic regression, or multivariate logistic regression, as appropriate.

Our results identified a statistically significant correlation between aminocaproic acid administration and increased risk of adverse neurological findings. These data highlight the need for further investigation into the neurophysiological effects of antifibrinolytic agents. While aminocaproic acid remains a valuable tool for reducing intraoperative bleeding, clinicians should be aware of its possible neurological risks and account for them when using it as part of their practice.

2025 SARP SPRING SYMPOSIUM

Name: Martin Lopez, Elian
Classification: Y2
Project Title: Empowering Future Health Professionals at a Hispanic Serving Institution: A F Mobile Clinic Approach to Skin Cancer Screening Education
Mentor: Jessica Chacon, Ph.D.
Group 2
8:30AM

Abstract:
The TTUHSC El Paso - Health Education and Awareness Team (EP-HEAT®) partnered with The Sun Bus and local dermatologists to train medical students in skin cancer screening within a border population. Through didactic sessions, practical demonstrations, and hands-on experience at a free community screening event, students gained exposure to dermatology and skin cancer detection. Pre-event surveys revealed limited dermatology knowledge and low confidence in screening skills, while post-event surveys showed significant improvements in students' confidence and ability to identify suspicious lesions. This initiative effectively enhanced medical students' understanding of skin cancer screening and fostered interest in community-based dermatologic care, highlighting the value of experiential learning in medical education.

2025 SARP SPRING SYMPOSIUM

Name: Moturi, Praneeth
Classification: Y2
Project Title: Arginase 2 (Arg2) regulates mTORC1 activity
Mentor: Jenna L. Jewell, UT Southwestern Medical Center
Group 2
9:00AM

Abstract:
Cells can detect different levels of nutrients which are crucial for cellular growth and proliferation. A disruption in nutrient sensing can lead to various human diseases. The mammalian target of Rapamycin (mTOR) is a Ser/Thr kinase that is part of the mTOR complex 1 (mTORC1), coordinates cell growth with nutritional status. It regulates cell growth based on the cell's nutritional status by integrating cues from amino acid and growth factor signaling to maintain cell growth, proliferation, autophagy, and cellular metabolism. mTORC1 kinase activity is hyperactivated in a variety of diseases such as cancer, obesity, Type 2 diabetes, and metabolic syndromes. Amino acids are essential for mTORC1 activation, and mTORC1 senses amino acids through the heterodimeric Rag GTPases. Whether or not the Rag GTPases regulate other essential cellular processes is currently not understood. Previous experiments using liquid chromatography mass spectrometry to analyze differential expression of metabolites in Rag GTPases knockout cells. Cells depleted of the Rag GTPases have a significant increase in arginine metabolism and elevated expression of the mitochondrial Arginase 2 (Arg2), which converts arginine to ornithine. We found that when Arg2 was overexpressed, it interacts with mTORC1 in human embryonic kidney 293 cells (HEK293A). Furthermore, under arginine stimulation conditions, mTORC1 activity was decreased when Arg2 was overexpressed compared to control. Arg2 expression is decreased in renal cell carcinoma, indicating that Arg2 could be a potential tumor suppressor in renal cell carcinoma.

Name: Myneni, Karthik
Classification: Y2
Project Title: In individuals with T1D, CD2+
HELIOS+ CD8 TMemory cells
produce low levels of inflammatory
cytokines.
Mentor: Alice Wiedeman, PhD, Benaroya Research Institute
S. Alice Long, PhD, Benaroya Research Institute
Group 2
9:30AM

Abstract:
Introduction and Objective: Faster progression of Type 1 Diabetes (T1D) correlates with a higher proportion of Helios+ CD8 T Memory (T_{mem}) cells, but their function is not well understood. This study investigates the function of Helios+ CD8 T_{mem} cells by comparing cytokine production between Helios+ and Helios- CD8 T_{mem} populations in individuals with T1D and healthy controls (HC).
Methods: PBMCs from 7 HC and 4 T1D individuals were stimulated with PMA/I for 4 hours and analyzed by flow cytometry to measure co-stimulation, Helios expression, and pro-inflammatory cytokine production in CD8 T_{mem} cells.
Results: Helios+ CD8 T_{mem} cells were more abundant in younger individuals in both HC and T1D groups (age vs Helios+; R2=0.3889, p=0.0403). Regardless of age or disease status, the frequency of pro-inflammatory cytokine-producing cells and the cytokine level per cell were lower in Helios+ compared to Helios- cells (paired t-tests, $p<0.05$). Additionally, the co-stimulatory molecule CD2 was lower in Helios+ than Helios- CD8 T_{mem} cells (paired t-tests, $p<0.05$).
Conclusion: The reduced frequency of Helios+ CD8 T_{mem} cells with lower cytokine production as individuals age, regardless of disease status, suggests the loss of a regulatory population. This highlights the need to explore why Helios+ cells are higher in faster progressors and whether other pathogenic cells are involved in T1D. The inverse relationship between Helios and CD2 suggests a role for CD2 in regulating T1D. This study emphasizes the potential role of CD2 and Helios in T1D pathogenesis. No institutional compliance was required for this project

2025 SARP SPRING SYMPOSIUM

Name: Nekoobahr, Saman
Classification: Y2
Project Title: Evaluating Post Discharge Pain Complaints to Improve Patient Experience: A Quality Improvement Project
Mentor: Dr. Keyuri Popat, MD Anderson Cancer Center
Group 2
10:00AM

Abstract:
Post-discharge pain management plays a significant role in overall patient experience and healthcare utilization. In 2019, the Centers for Medicare & Medicaid Services (CMS) removed the “Communication About Pain” questions from inpatient evaluations, leaving a gap in assessing post-discharge pain management effectiveness. At a tertiary cancer institution, automated post-discharge calls capture patient concerns, with pain being a primary issue. This quality improvement project aims to identify the predominant reasons patients call post-discharge with pain complaints, with the goal of improving pain management strategies. A retrospective review of post-discharge phone calls from 101 inpatients was conducted, categorizing calls into six distinct reasons: inadequate pain control, resolved concerns, need for patient education, change in medical condition, increasing tumor burden, and adverse medication reactions. Results showed that 39.6% of patients reported inadequate pain control, 12.9% required further education, and 8.9% experienced a change in medical condition. Notably, 22% of patients were readmitted, with 27% of those cases attributed to pain. These findings underscore the need for improved patient education, enhanced provider-patient communication, and personalized pain management plans. Addressing these gaps may reduce unnecessary healthcare utilization, improve patient satisfaction, and optimize post-discharge pain management.

2025 SARP SPRING SYMPOSIUM

Name: Periapattanam, Gaurav
Classification: Y2
Project Title: Examining the Role of PGRMC1 in HER2+ Breast Cancer
Mentor: Dr. Rajkumar Lakshmanaswamy
Group 2
10:30AM

Abstract:
Introduction: Breast cancer is the most diagnosed cancer in the United States amongst women. Breast cancers can be subdivided by their expression status of estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2) or by a lack of all these receptors, which are referred to as triple negative breast cancer (TNBC). Specifically, HER2-overexpressing breast cancers accounts for approximately 15-20% of invasive breast tumors and are associated with poorer prognostic outcomes. While therapies for the management of HER2+ breast cancer patients exist, treatment resistance is an existing problem that needs to be addressed. Approximately 20% of HER2+ patients experience relapse/metastases due to therapy resistance whether it be primary or secondary. Progesterone receptor membrane component 1 (PGRMC1) is a member of the MAPR family of proteins and is involved in various physiological processes including heme homeostasis and cytochrome p450 functions. PGRMC1 has been found to be overexpressed in numerous cancers including many breast cancers including HER2+ or overexpressed. In this study, PGRMC1 is being evaluated as a potential biomarker for targeted therapy in HER2+ breast cancer.
Materials and Methods: SK-BR-3 (HER2+) breast cancer cells were used for the experiments. PGRMC1 expression was inhibited by using AG205. Different does (1 µM - 25 µM) of AG205 was treated to SK-BR-3 and cell proliferation was measured using an MTS assay. RNA was extracted and used for the RT-2 Profiler Cancer Pathway Microarray. Western Blot analysis and immunofluorescence was performed to assess protein expression.
Results: Our data revealed inhibiting PGRMC1 with AG205 resulted in a dose-dependent decrease in cell proliferation in cell proliferation of HER2+ breast cancer cells. 15 µM of AG205 was taken for further experiments as it was effective in killing approximately 50% of HER2+ cancer cells. The Cancer Pathway Finder PCR array demonstrated clear differences between untreated and treated SK-BR-3 cells.
Conclusion: Overall, PGRMC1 has the potential to be a therapeutic marker for targeted therapy in addition to current treatments of HER2+ breast cancer.

2025 SARP SPRING SYMPOSIUM

Name: Rakesh, Aman
Classification: Y2
Project Title: Gedunin targets Sonic Hedgehog signaling to inhibit metastasis of pancreatic ductal adenocarcinoma
Mentor: Dr. Ramadevi Subramani Reddy
Group 2
11:00AM

Abstract:
Introduction: PDAC is highly lethal due to late detection and limited treatment. The Sonic Hedgehog pathway supports tumor growth and stemness. In this study, we explore Gedunin, a phytochemical derived from Azadirachta indica (neem tree), that may suppress Shh pathway and reduce metastatic potential.
Materials and Methods: HPAC and Cancer stem cells (CSCs) were both treated with 25 µM Gedunin. After treatment, sphere forming capacity and tumor volumes were analyzed. We also used RT-PCR to differentially regulated genes in treated cells of both cell lines. Finally, In-silico analyses and TCGA data were used for further understanding of pathways involved.
Results: Gedunin treatment resulted in significant reduction in tumor volumes, colony forming capacities. RT-PCR revealed significant gene regulation following therapy; Shh downregulation was observed for HPAC and CSCs.
Conclusion: Gedunin therapy showed potential for treatment of PDAC with its ability via downregulation of Shh pathway and reduced viability of pancreatic cancer cells.

2025 SARP SPRING SYMPOSIUM

Name: Serrano, Jillian
Classification: Y2
Project Title: The Impact of Enhanced Recruitment and Enrollment Support on the Diversity of a Genomic Research Study
Mentor: Monica H. Wojcik MD, MPH, Boston's Children's Hospital and Harvard Medical School, Broad Institute of MIT and Harvard
Group 3
8:00AM

Abstract:
Genomic sequencing has grown significantly since the completion of the Human Genome Project in 2003. The cost-effectiveness of sequencing has led to the discovery of therapeutic targets and the use of genetic testing in clinical settings. The Rare Genomes Project is a research study at the Broad Institute of MIT and Harvard that began in 2017 and offers free whole genome sequencing for individuals and families with rare and genetically undiagnosed conditions. Genomic studies like the Rare Genomes Project help form the foundation for linking genes and disease through shared databases. Prior to 2021, the study was limited to enrolling participants proficient in English, with some capacity to enroll Spanish-speaking only participants. However, within the first four years of the study, no participants spoke a language other than English. The demographics of the RGP cohort prompted the initiation of a diversity-focused study protocol to increase diversity within the study. Research suggests that the underdiagnosis in underrepresented populations is related to the lack of representation in genomic databases. We have identified the necessity to build on previous research and implement interventions to reduce structural barriers and increase access for medically underserved populations. The barriers identified within our study included but were not limited to navigating online resources, not speaking English, living in rural areas, and lacking access to transportation. Through modifications to the recruitment and enrollment process, the aims of this protocol include diversifying the study population and to identify what is most important to people with additional needs and how to support them in future research studies. The outcome of these interventions will shed light on effective methods to increase access to genetic testing for minority populations.

2025 SARP SPRING SYMPOSIUM

Name: Spier, Kyle
Classification: Y2
Project Title: Development of a Graphical User Interface for Estimation of Osteoradionecrosis Time-to-Event Risk Using NTCP Models
Mentor: Dr. Clifton David Fuller, Department of Radiation Oncology at MD Anderson Cancer Center
Group 3
8:30AM

Abstract:
Osteoradionecrosis of the jaw (ORNJ) is a serious complication of radiotherapy affecting 4-15% of head and neck cancer patients following radiotherapy (RT). Its management is challenging due to the lack of early detection methods and risk assessment tools. The rising incidence of human papillomavirus-associated oropharyngeal cancer (HPV+ OPC) underscores the need for long-term monitoring and predictive tools for ORNJ in younger, long-term survivors. This study aims to develop a graphical user interface (GUI) for estimating the time-to-event (TTE) risk of ORNJ using NTCP models and to assess its usability.
A user-centered design approach was employed to develop the GUI, incorporating feedback from initial testing phases. The System Usability Scale (SUS) was utilized to evaluate the interface. Usability feedback was gathered from medical trainees, and improvements were made based on their responses. A preliminary analysis of survey data from trainees was conducted, followed an official physician analysis (14 responses).
Results: The median SUS score was 82.5 (28.8), indicating overall positive usability. Key areas for improvement included GUI instructions, terminology, and aesthetics.
Developing a GUI for the estimation of TTE ORNJ risk represents a significant advancement in applying NTCP models in clinical settings. The interface enhances decision-making in radiotherapy planning and improves patient outcomes. Future research will focus on incorporating additional feedback, conducting longitudinal studies to assess clinical impact, and expanding the tool's application to other radiation-induced complications.

2025 SARP SPRING SYMPOSIUM

Name: Torres, Nicole
Classification: Y2
Project Title: Investigating Epithelial Barrier Function and Proliferation of Human Intestinal Organoid Lines from Very Early Onset Inflammatory Bowel Disease Patients
Mentor: Sarah Blutt, Baylor College of Medicine
Group 3
9:00AM

Abstract:
Human intestinal organoids (HIOs) are cultivated from intestinal stem cell samples of very early onset IBD patients. If these duplicating organoids display decreased transepithelial resistance characteristic of VEO-IBD in vivo and display upregulation of the WNT pathway in comparison to disease-free organoids, it is possible that VEO-IBD HIOs may be used for laboratory testing and studying the effects of new medications and treatments. This study utilizes transepithelial electrical resistance (TEER) to determine transepithelial resistance values in Ohms for VEO-IBD HIOs and control HIOs. Furthermore, immunofluorescent staining of DAPI and □-catenin in control and VEO-IBD HIOs grown in differentiation media and proliferative media is used to determine WNT pathway activation. If the WNT pathway is active, □-catenin is translocated to the nucleus; hence, the antibody immunofluorescent staining of this protein. Proliferative media activates the WNT pathway and should show more □-catenin in the nucleus. The following experiments were done on HIOs from 6 VEO-IBD patients and 6 controls.

Name: Valladares, Elene
Classification: Y2
Project Title: Qualitative Assessment of Educational Materials on Self-Collection for Human Papillomavirus (HPV) among Underscreened Women in the Rio Grande Valley
Mentor: Jane Montealegre Ph.D., The University of Texas MD Anderson Cancer Center
Group 3
9:30AM

Abstract:
Regular screening is an important tool for the prevention of cervical cancer. However, for many women and persons with a cervix, the traditional Papanicolaou (Pap) test (cytological screening) is inaccessible and/or unacceptable for various reasons including income, education, modesty concerns and/or access to care. 1 Current guidelines recommend that women aged 21 to 29 at average risk undergo cytological screening every three years. For women aged 30 to 65, the screening interval can be extended to five years if they are receiving human papillomavirus (HPV) testing alone or in combination with cytological screening. 2,3 The most common cervical screening method in the U.S. is to undergo a provider conducted pelvic exam, which is necessary for cytology and cytology/HPV cotesting and many barriers stem from this requirement. 4 Human papillomavirus testing with self-collected samples is a promising alternative that can overcome barriers related to access, convenience, and comfort, making it an option for increasing screening uptake in underserved populations. 5 As of early 2024 the Food and Drug Administration (FDA) approved primary HPV self-collection for cervical cancer screening in a health-care setting. HPV self-collection kits can be used in clinics as an alternative to a scheduled provider-conducted Pap and/or HPV test. This may also be possible for distribution at other appointments (e.g., lab visits or urgent care) or potentially mailed to patients' homes in the future, though it is currently only FDA-approved for collection within a healthcare setting. 6 Other benefits of HPV self-sampling kits include the potential to address other barriers such as disruptions in the U.S. healthcare system due to the COVID-19 pandemic that led to a decline in routine primary care. 7 The effectiveness of mailed self-sample HPV testing kits to improve cervical cancer screening participation among underscreened patients in a safety net health system has been assessed by the Prospective Evaluation of Self-Testing to Increase Screening (PRESTIS) trial. 8 Extensions of this study assessed the participants' experiences and acceptability of self-sample HPV testing kits reporting an overall positive experience and high acceptability. 9 Currently, the "Prevención en sus Manos" pilot study is assessing the feasibility and acceptability of selfcollection for HPV testing among underscreened women in the Rio Grande Valley of Texas, a region with low cervical cancer screening coverage and high incidence of disease. 10 The study is done in a community-based setting. To ensure the success of self-collection, it is crucial to develop linguistically and culturally tailored educational materials for eligible women, fostering better understanding and engagement with the screening process. The following are results of a series of telephone interviews with Prevención en sus Manos participants on their perceptions and experiences regarding the bilingual (English/Spanish) educational materials and instructions they received before the self-collection process

2025 SARP SPRING SYMPOSIUM

Name: Vasquez, Victor
Classification: Y2
Project Title: “Understanding the role of PGRMC1 in sorafenib-resistant Hepatocellular Carcinoma”
Mentor: Dr. Ramadevi Subramani Reddy
Group 3
10:00AM

Abstract:
Hepatocellular carcinoma (HCC) remains among the most deadly cancers worldwide, primarily due to late detection and limited success of existing treatments. Sorafenib, a multi-kinase inhibitor, is widely used as the standard systemic therapy for advanced HCC; however, most patients quickly develop resistance, significantly reducing its long-term benefit. Emerging studies point to alterations in lipid metabolism and drug efflux as key contributors to this resistance, though the molecular underpinnings are still not well understood. Progesterone receptor membrane component 1 (PGRMC1), known for its roles in lipid regulation and drug responsiveness, has been linked to resistance mechanisms in various cancers but remains understudied in HCC. In this investigation, sorafenib-resistant Hep3B cell lines were established, revealing notably higher PGRMC1 expression compared to parental controls. To further assess its function, Hep3B cells were engineered to stably overexpress PGRMC1. Both resistant and overexpressing cells exhibited enhanced survival in the presence of sorafenib, indicating a role for PGRMC1 in drug resistance. Notably, combined treatment with sorafenib and AG205, a selective PGRMC1 inhibitor, significantly decreased cell viability in both models, effectively restoring drug sensitivity. These findings highlight PGRMC1 as a contributor to sorafenib resistance in HCC, potentially through modulation of survival and metabolic processes, and support its candidacy as a therapeutic target to enhance treatment efficacy in affected patients.

Name: Wing, Jonathan
Classification: Y2
Project Title: 1-Day VS 3-Day FIT Testing
Mentor: Jennifer Molokwu, M.D., M.P.H
Group 3
10:30AM

Abstract:
Colorectal cancer (CRC) causes significant morbidity and is a leading cause of cancer-related deaths in the United States (US). Worldwide, CRC ranks third in cancer-related deaths, with mortality rates trending up over the last 20 years [1,2]. There remains a disparity in CRC incidence and mortality among different racial and ethnic groups. Among Hispanics specifically, CRC ranks second in cancer-related death [3]. Many reasons are attributed to this disparity; however, these reasons have not been fully elucidated [4]. Exploring these disparities and possible interventions further is essential, especially given that Hispanics comprise 20% of the US population [5]. CRC is a slowly progressing disease, and early screening is vital to prevention and to achieving better treatment outcomes. In a longitudinal study, CRC screening reduced the CRC mortality rate from 20% to 12% between 2000 and 2018 [6]. Currently, several methods have been recommended by the United States Preventive Services Task Force (USPSTF) for CRC screening. They include the guaiac fecal occult blood testing (gFOBT), fecal immunochemical test (FIT), multitarget stool DNA (sDNA-FIT or MT-sDNA), sigmoidoscopy, computed tomographic colonography (CT colonography), and colonoscopy [7]. Despite the wide variety of CRC screening methods available, Hispanics continue to be screened at a consistently lower rate than the general population [5]. This disparity in screening may contribute to Hispanics being less likely to receive an early-stage diagnosis and more likely to be diagnosed with advanced disease than non-Hispanic whites (NHWs) [8]. Studies have tried to explain these screening disparities, with some attribution to lack of insurance, fear, lack of knowledge, financial resources, mistrust of the healthcare system, and embarrassment [9,10]. Other studies attributed these disparities to ineffective communication with physicians due to language differences or other scheduling difficulties. A few studies went so far as to conclude that despite having a Spanish-speaking office visit, Hispanic patients were 43% less likely to receive CRC screening [11,12,13]. Stool-based testing, such as with fecal immunochemical test (FIT) kits, may reduce the CRC screening disparity between Hispanics and NHWs. The primary advantage of FIT kits' is the relative ease of use compared to alternative CRC screening tests. For instance, patients do not need to modify their diet or undergo surgery, and they can return the tests in person or by mail. Studies have shown that, in general, Hispanics express satisfaction with the ease of use of FIT kits, increasing their likelihood of adopting FIT [14]. If the FIT is abnormal, patients must still undergo a diagnostic colonoscopy to confirm the diagnosis, helping reduce CRC mortality. Although prior studies disagree on whether or not Hispanics have higher or lower diagnostic follow-up rates than NHWs, the bottom line still stands that increased CRC screening should also improve the pool of screened Hispanics, thereby expanding the pool of Hispanics willing to undergo a diagnostic follow-up [15,16]. Despite inconsistencies in studies reporting CRC follow-up rates in Hispanics, studies have at least shown that sending reminders to patients to return the FIT kits has improved baseline FIT kit return rates with upwards of 17% increase in return rate, with some studies suggesting a response rate directly proportional to the number of reminders [17,18]. While studies have shown that the number of reminders corresponds to FIT return rates, no studies thus far have examined a direct comparison between 3-day vs. 1-day FIT kit return rates and whether the 1-day FIT, because of its ease of use, would suggest the possibility of a higher return rate. Our study aims to evaluate the effect of a 1-day FIT vs a 3-day FIT on CRC screening completion in a predominantly Hispanic population living on the US-Mexico

border. In addition, our study hopes to explore the effect of navigation intensity measured by the number of outreach on participants' FIT return.

2025 SARP SPRING SYMPOSIUM

Name: Asmis, Katherine
Classification: Y3
Project Title: Tramadol-Related Adverse Events in Texas
Mentor: Dr. Sarah Watkins, Assistant Professor in Department of Emergency Medicine,
Medical Director of West Texas Regional Poison Center
Group 3
11:00AM

Abstract:
Tramadol prescriptions increased in both the southern United States and in Mexico following tramadol becoming a schedule III drug in 2014[2,3,4]. Therefore, the goal of this study was to identify whether Tramadol-related adverse events occur at a significantly higher rate in the El Paso Borderplex region when compared to the state of Texas, especially when in combination with other substances. We gathered data from the National Poison Data System and the Toxicoll data system to identify patterns of tramadol use and adverse events across Texas. We found that while the number of adverse events related to tramadol ingestion across Texas are on the decline, El Paso county has the second highest rate of adverse events and most adverse events are related to suspected suicide attempts

2025 SARP SPRING SYMPOSIUM

Name: Black, Mariah
Classification: Y3
Project Title: Characterizing TKI Resistance in FLT3+ Acute Myeloid Leukemia Cell Lines
Mentor: Anna M. Eiring, PhD, The University of Texas at El Paso
Group 3
11:30AM

Abstract:

- Acute Myeloid leukemia (AML) impacts cells of the myeloid lineage. FLT3 is a common mutation that has been related to poorer prognosis.
- Tyrosine Kinase Inhibitors have addressed FLT3+ AML, but there is emerging resistance to treatment that is a continued clinical challenge.
- This study aimed to develop an *in vitro* model of TKI resistance in FLT3+ AML cell lines (MOLM-13 and MOLM-14) and evaluate underlying signaling pathways contributing to resistance.
- Methods of the study included utilizing tissue culture and gradually increasing Midostaurin (FLT3 TKI) to a concentration of 100nM. Then we measured cell viability, colony formation, and apoptosis to confirm resistance. Lastly, we performed immunoblot analyses to evaluate underlying signaling pathway changes.
- TKI resistance was confirmed via viability, colony formation, and Annexin V assays. While traditional signaling pathways including STAT3 and STAT 5 were not activated, phosphorylated Aurora kinase B was, suggesting a potential role of cell cycle regulators driving TKI resistance.
- Future directions include further evaluation of signaling pathways and DNA/RNA sequencing.

2025 SARP SPRING SYMPOSIUM

Name: Cain, Ryan
Classification: Y3
Project Title: Differential expression of macrophages in gastric antral smooth muscle of diabetic versus idiopathic gastroparetic patients
Mentor: Munmun Chattopadhyay
Group 4
8:00AM

Abstract:
Gastroparesis is the sequelae of early satiety, nausea, vomiting, abdominal pain and bloating secondary to the loss, or lack, of emptying in the stomach in absence of mechanical obstruction. This condition has two non-iatrogenic etiologies: diabetic and idiopathic. This study was designed to elucidate whether patients with Type II Diabetic Gastroparesis (DGP) and Idiopathic Gastroparesis (IGP) had differing or common alterations to their inflammatory profile when compared to Non-Diabetic Non-Gastroparesis (NGP) controls within the unique border population of El Paso, Texas. In this study, the role of macrophages and inflammatory mediators was investigated in the setting of DGP and IGP. RNAseq studies of freshly harvested full thickness gastric antral biopsies demonstrated that there was differential expression in the DGP group when compared to IGP and NGP (N=4-5 for each group). These differential expressions were then further evaluated by means of qRT-PCR, Western Blotting, and Immunohistochemistry (IHC) staining. This study suggests that differential expression of macrophage phenotype to M1 and away from M2 coexists in the setting of a proinflammatory profile in both IGP and DGP through unique molecular mechanisms.

2025 SARP SPRING SYMPOSIUM

Name: Chen, Eileen
Classification: Y3
Project Title: Role of histone deacetylase inhibitor targeting cell junction protein in diabetic sensory neuropathy
Mentor: Vikram Thakur and Munmun Chattopadhyay
Group 4
8:30AM

Abstract:
Diabetic painful neuropathy is one of the most debilitating complications of diabetes. The involvement of tight junctions in the peripheral nervous system (PNS) is not fully understood in the diabetic condition. It has been previously reported that in diabetic neurons, there is an increase in histone deacetylases (HDACs), decrease in axonal regeneration, and an altered expression of tight junction proteins, which may change the permeability of the blood–spinal barrier in the nerve degeneration process. This study investigates the neuroprotective effects of HDAC inhibitor (Romidepsin/FK228) on tight junction proteins in the spinal cord and dorsal root ganglia (DRG) under diabetic conditions in vivo and in sensory neurons in vitro. For in vivo studies, type 2 diabetic (T2D) mice were treated with FK228 at 1 mg/kg twice a week for 3 weeks. Mice were grouped as control, diabetic only, diabetic with treatment. For in vitro studies, F11 DRG neurons were used. The expression of junction proteins CX43, Occludin and Claudin-1, ZO-1, neuronal markers Neuro H, GAP43 as well as stress-related markers and HDAC2, EGFR, and Nrf2 in the PNS were measured by immunohistochemistry and Western blot analysis after the completion of the treatment. Our results show that FK228 treatment had significant alteration in tight junction protein expression, histone acetylation and expression of stress-related markers in both studies. Overall, this study suggests that FK228 may provide neuroprotective effects at tight junctions of the spinal cord and DRG neurons with anti-inflammatory effects, which could offer another alternative towards a novel treatment approach for diabetic sensory neuropathy.
Research Question: Does the HDAC inhibitor FK228 alter tight junction protein expression and provide neuroprotection in diabetic? sensory neuropathy?
Specific Aim: This study investigates FK228's effects on tight junction proteins, histone acetylation, neuronal, and stress-related markers in the spinal cord and DRG under diabetic conditions using in vivo and in vitro models to assess its neuroprotective and anti-inflammatory potential.

2025 SARP SPRING SYMPOSIUM

Name: Chen, Ethan
Classification: Y3
Project Title: The Effect of Increased BMI on Grey Matter Volume: Can we predict Grey Matter Atrophy in the Younger Population?
Mentor: Dr. Hugo Sandoval, Ph.D
Group 4
9:00AM

Abstract:
This study examines the impact of obesity on gray matter volume in young individuals. While obesity-related gray matter atrophy is linked to cognitive decline in those over 65, identifying similar correlations in younger populations could aid early screening and prevention. Our findings do not align with existing literature but show that overweight participants had higher gray matter volume than underweight/normal BMI and obese individuals. This raises questions about whether obesity itself or its comorbidities drive brain atrophy. Further research with a more diverse dataset is needed to clarify obesity's role in brain anatomy.

2025 SARP SPRING SYMPOSIUM

Name: Contreras, Stephen
Classification: Y3
Project Title: Impact of Social Drivers of Health on Mammogram Screening Adherence Among Women of Different Hispanic Subgroups in the United States
Mentor: Mariela Lane, M.D.
Group 4
9:30AM

Abstract:
Hispanic women face the highest breast cancer mortality rates, with rising incidence across ethnicities. Despite Hispanics comprising over 19% of the U.S. population, studies often treat this population as monolithic, overlooking subgroup differences that affect healthcare outcomes. This study analyzes mammogram screening adherence among Hispanic subgroups using NHIS data from 2010, 2013, 2015, and 2018, focusing on socioeconomic variables. We found that insurance coverage positively influenced screening adherence across all subgroups. Mexican-Americans with longer U.S. residency had lower adherence, and higher education was associated with decreased adherence among Dominicans. Regular healthcare access and recent doctor visits improved adherence across all groups. Barriers included financial constraints, lack of specific reasoning, and procrastination. These findings suggest a need for culturally tailored healthcare strategies that consider subgroup-specific challenges.

2025 SARP SPRING SYMPOSIUM

Name: Dornbusch, Ana
Classification: Y3
Project Title: Characterizing Eating Disorders among 3,485 Individuals Who Identify as Transgender
Mentor: Karen K. Miller, Massachusetts General Hospital and Harvard Medical School
Group 4
10:00AM

Abstract:
Introduction: Eating disorders (EDs) have one of the highest mortality rates of any psychiatric illness, and transgender individuals may be at increased risk due to body dysmorphia and the desire to suppress secondary sex characteristics. This study aimed to assess the frequency and severity of EDs among transgender individuals.
Methods: We conducted a retrospective chart review of 3,485 transgender individuals who received care within the Mass General Brigham (MGB) healthcare system between January 1, 2000, and June 2, 2023, using data from the Research Patient Data Registry (RPDR). We identified individuals diagnosed with EDs and analyzed clinical presentations, medical complications, and psychiatric comorbidities.
Results: Eighty-four patients (2.5%) of the 3,485 received an ED diagnosis. Restrictive EDs were most common (51.2%), followed by binge-type EDs (16.7%) and other specified/unspecified EDs (32.1%). Medical complications included hypokalemia (26.0%), hyponatremia (29.0%), low hematocrit (41.0%), and severe vitamin D deficiency (25.4%). Psychiatric comorbidities were common: 98.8% had a depressive disorder, and 65.5% experienced psychiatric hospitalizations. Most patients were prescribed psychiatric medications (91.0% antidepressants, 73.8% antipsychotics, 63.1% mood stabilizers, and 79.8% took ≥ 2 psychiatric medications).
Conclusion: EDs are frequent and severe among transgender individuals, with high rates of medical and psychiatric complications. These findings highlight the need for targeted screening, early intervention, and clinician education to address EDs in transgender and gender-diverse populations.

2025 SARP SPRING SYMPOSIUM

Name: Elamrati, Rokaya
Classification: Y3
Project Title: Renal Cancer and Heavy Metals: A Systematic Review
Mentor: Narges Khanjani
Group 4
10:30AM

Abstract:
The incidence of kidney tumors has steadily increased over recent decades, with environmental pollution, particularly heavy metal exposure, emerging as a potential contributing factor. This systematic review consolidates evidence on the associations between heavy metal exposures and renal cancer, particularly renal cell carcinoma (RCC). Following a comprehensive literature search and screening process, 18 studies were included, spanning diverse populations and methodologies. Meta-analysis was not possible due to the huge methodological heterogeneity of the articles. Significant positive associations with renal cancer were observed for cadmium, lead, copper, mercury, arsenic, and nickel, suggesting their role as potential risk factors. Mixed associations were reported for zinc, selenium, manganese, and iron, reflecting inconsistencies in findings across different studies and exposure assessments. In contrast, titanium, tungsten, chromium, and magnesium showed no significant association with renal cancer.
This review highlights the critical need for regulatory measures to limit cadmium and lead exposure, particularly in occupational and industrial settings, and underscores the possible role of selenium deficiency in causing RCC. Variability in study methodologies and exposure measurements points to the necessity of standardized approaches in future research. By identifying metals of significant public health concern and their associations with RCC, this review provides essential insights to guide preventive strategies and inform further investigations into the role of environmental contaminants in renal carcinogenesis.

Name: Elliott, David
Classification: Y3
Project Title: A Role for the Bone Marrow Microenvironment in Drug Resistance of Acute Myeloid Leukemia (AML)
Mentor: Anna Eiring, Ph.D., The University of Texas at El Paso
Group 4
11:00AM

Abstract:
Acute Myeloid Leukemia (AML) is a hematologic malignancy characterized by uncontrolled proliferation of myeloblasts in the bone marrow. While tyrosine kinase inhibitors (TKIs) targeted therapy is used after general chemotherapy, resistance remains a significant challenge. The tumor suppressor gene G0/G1 switch gene 2 (G0S2) has been identified to play a role in AML progression and drug resistance. This study investigates the influence of the bone marrow microenvironment on G0S2 expression and its potential role in TKI resistance. FLT3+ AML cell lines (MOLM-14 and MV4-11) were cultured in regular medium (RM), conditioned medium (CM), and direct contact (DC) with HS-5 bone marrow stromal cells, followed by treatment with or without Midostaurin. Annexin V flow cytometry assays revealed increased apoptosis in RM-treated cells, while CM and DC groups exhibited resistance to Midostaurin. RT-qPCR analysis indicated that the bone marrow microenvironment may support G0S2 expression rather than suppress it, suggesting the presence of other extrinsic protective factors. These findings highlight the complexity of AML drug resistance mechanisms and warrant further investigation into microenvironmental contributions and possible systemic influences to therapy evasion.

2025 SARP SPRING SYMPOSIUM

Name: Han, Grace
Classification: Y3
Project Title: The Association Between Putamen Volumes and a History of Parental Depression
Mentor: Dr. Hugo Sandoval
Group 4
11:30AM

Abstract:
Major Depressive Disorder has been linked to structural brain differences. The putamen, a structure known for its role in motor control and movement disorders, is of particular interest due to its essential part of the cortico-striatal-thalamic circuit that governs reward learning and motivation. This focus of this study is to investigate subcortical differences, specifically left and right putamen volumes, in subjects with a parental history of depression compared to subjects without a parental history of depression utilizing data from the Human Connectome Project (HCP). With the support of previous research, the volume of the putamen may potentially serve as a neuroanatomical marker for predicting MDD in patients of higher risk. Identification of MDD in high-risk patients can allow for early treatment intervention to reduce negative consequences. A total of 77 subjects with a parental history of depression were compared to age, gender, race, and ethnicity matched controls. Putamen volumes were analyzed using MRI segmentation data, and two sample T tests were conducted to determine differences between groups. Contrary to prior studies, results showed no significant difference in left or right putamen volumes between groups. These findings suggest that putamen volume may not serve as a reliable neuroanatomical marker for familial risk of MDD in young adults. Future research should explore additional subcortical structures and consider a broader age range to further assess the neurobiological underpinnings of MDD risk.

2025 SARP SPRING SYMPOSIUM

Name: Harvey, Madelyn
Classification: Y3
Project Title: Effect of obesity on inferior frontal gyrus thickness in adult women
Mentor: Dr. Hugo Sandoval
Group 5
8:00AM

Abstract:
Obesity is a public health concern associated with significant costs and with impacts on many medical issues. Extensive research has searched for the causes, effects, and potential treatment options for obesity. Many researchers have turned to the brain for its role as a major regulator of hunger and satiety as well as its role in planning, inhibiting, and rewarding behavior. Research has shown that there are sex-specific differences in brain anatomy but limited single-sex research exists exploring specific brain areas impacted by obesity. This study explored changes in inferior frontal gyrus thickness in women due to its role as part of the lateral prefrontal cortex which is important for executive function and inhibitory control. Using data from the Human Connectome project, thirty-five adult women with obesity were matched with 35 control subjects with normal body mass index (BMI) and inferior frontal gyrus thickness from magnetic resonance imaging was compared between the two groups. No significant difference in inferior frontal gyrus thickness was found between the two groups. Future research should expand upon sample size and diversity of the current study population to verify these results. Additionally, further research is needed to examine how weight distribution in obesity may impact brain changes seen in obesity.

Name: Kan, Brian
Classification: Y3
Project Title: Evaluation of Solar Eclipse Ocular Health Events
Mentor: Dr. Jessica Chacon, Ph.D.
Group 5
8:30AM

Abstract:
Introduction/Background
Solar eclipses are awe-inspiring events, but viewing the sun without proper protection can cause serious eye damage, including solar keratitis and solar retinopathy. While ISO 12312-2 compliant “eclipse glasses” provide effective protection, disparities in ocular healthcare—such as limited specialist access, language barriers, and low awareness—hinder prevention. These challenges are particularly significant in underserved bilingual communities, where health literacy is crucial for reducing eclipse-related eye injuries.
Methods
This study aimed to improve eye health literacy in El Paso, Texas, through a bilingual educational initiative. Texas Tech Health Sciences Center El Paso, Paul L. Foster School of Medicine’s Ophthalmology Student Interest Group partnered with Promotoras, medical students, and local healthcare professionals to conduct outreach events leading up to the April 8, 2024, solar eclipse. The two largest events, hosted with El Paso Community College, featured bilingual presentations, interactive quizzes, and tabling to address misconceptions about ocular health and eclipse safety.
Results
Surveys assessed participant demographics and knowledge before and after the event. Among 835 attendees, 124 completed pre-event surveys and 36 completed post-event surveys. Of respondents, 89% identified as Hispanic, 18% completed surveys in Spanish, and 28% lacked health insurance. All participants found the event beneficial, with 97% reporting improved understanding of eye health. Quiz scores increased significantly by 21.68% ($p < 0.001$), demonstrating the program’s effectiveness.
Conclusion
This intervention successfully educated a diverse, underserved population on protection. Expanding similar initiatives alongside high-profile events can improve outreach, health literacy, and long-term eye health awareness in vulnerable communities.

2025 SARP SPRING SYMPOSIUM

Name: Khan, Nimah
Classification: Y3
Project Title: Non-genomic progesterone signaling in HER2 positive breast cancer
Mentor: Rajkumar Lakshmanaswamy, Ph.D
Group 5
9:00AM

Abstract:
Introduction: Breast cancer continues to be the leading cause of cancer death among females worldwide. About a quarter of breast cancers are positive for HER2 overexpression. Progesterone receptor membrane complex 1, or PGRMC1, has been shown to play a role in enhancing growth of breast cancers that are ER positive and PR positive. This study examines the role of PGRMC1 in promoting growth of HER2 positive breast cancer cells. This is achieved by treating HER2 positive SKBR3 cells with progesterone.

Materials and Methods: SKBR3 cells were treated with 10µM progesterone for 24, 48 and 72 hours. Cells were harvested at these timepoints and used for cell proliferation and apoptosis analysis. MTS assay was used to measure cell proliferation. Immunohistochemistry (IHC) in treated and untreated progesterone cells was done for proliferation and anti-apoptotic markers.

Results: The progesterone-treated SKBR3 cells had an increase in the number of viable cells after 24 hours, 48 hours, and 72 hours as compared to the control group of SKBR3 cells that were untreated. In the IHC stains, there was significantly increased staining for PGRMC1 in progesterone-treated SKBR3 cells compared to untreated SKBR3 control cells. Additionally, there was an increase in staining for Cyclin D1, PCNA, and Ki67 in progesterone-treated SKBR3 cells compared to untreated SKBR3 control cells. The anti-apoptotic marker Bcl2 was also upregulated from progesterone treatment.

Conclusion: There was a gradual increase in cell proliferation over time when SKBR3 cells were treated with progesterone. In the IHC stains, there was upregulation of PGRMC1, cell proliferation markers, and an anti-apoptotic marker from progesterone.

2025 SARP SPRING SYMPOSIUM

Name: Khazi, Abrar
Classification: Y3
Project Title: Examining the Prevalence of Autism Spectrum Disorder in Children across Race/Ethnic Groups and Household Income Levels in the United States
Mentor: Dr. Sarah Martin
Group 5
9:30AM

Abstract:
This study investigates disparities in the prevalence of Autism Spectrum Disorder (ASD) across racial/ethnic groups and household income levels in the United States, using data from the National Survey of Children's Health (NSCH). The hypothesis suggested that minority racial/ethnic groups and children from lower-income households would have lower reported prevalence rates of ASD. Logistic regression analysis was used to examine these relationships, adjusting for factors such as age, sex, and highest education level in the household. While trends were observed indicating higher ASD prevalence in Non-Hispanic Black children and lower prevalence in Asian children and children from higher-income households, the analysis ultimately did not find statistically significant differences across race/ethnicity and income levels. This failure to reject the null hypothesis suggests that, based on the data, there is no conclusive evidence of disparities in ASD prevalence in these demographic groups. These findings highlight the complexity of ASD diagnosis and emphasize the need for further investigation into other factors that may contribute to these disparities. Future research should explore additional variables, such as healthcare access, cultural influences, and diagnostic biases, to better understand the nuances of ASD prevalence and diagnosis across demographic groups.

2025 SARP SPRING SYMPOSIUM

Name: Kolli, Shreya
Classification: Y3
Project Title: The Role of Glucose in Regulating LINC01016-dependent Gene Expression in Estrogen Receptor Positive Breast Cancer Cells
Mentor: Dr. Shrikanth Gadad, Ph.D
Group 5
10:00AM

Abstract:
Estrogen receptor-positive (ER+) breast cancer is the most common subtype of breast cancer and is influenced by both hormonal signaling and metabolic conditions, such as glucose availability. Cancer cells often exhibit the Warburg effect, a metabolic shift that favors glycolysis even in the presence of oxygen, to support rapid growth and proliferation. Long non-coding RNAs (lncRNAs) have emerged as key regulators of gene expression in cancer biology. This project explores the role of LINC01016, an estrogen-induced lncRNA, in modulating gene expression under varying glucose concentrations in ER+ breast cancer cells. Using doxycycline-inducible MCF7 cell lines engineered to overexpress either LINC01016 or GFP (control), we treated the cells with glucose concentrations of 1 g/L, 5 g/L, and 15 g/L. RNA was extracted, followed by RT-qPCR to confirm the overexpression of LINC01016 and RNA sequencing to identify differentially expressed genes. In high glucose environments, LINC01016 overexpression led to the upregulation of genes involved in cell morphology and junctions, while genes regulating cell cycle progression were downregulated. Gene set enrichment analysis further confirmed that elevated glucose, combined with LINC01016 expression, altered pathways related to cellular structure and proliferation. These results suggest that LINC01016 mediates glucose-sensitive transcriptional responses that may influence tumor progression through changes in cell structure and cell cycle control. Further investigation of this lncRNA could provide insight into metabolic vulnerabilities in ER+ breast cancer and inform future therapeutic strategies.

Name: Lovasz, Daniel
Classification: Y3
Project Title: Beyond the Surface: A Collaborative Effort for Free Skin Cancer Screenings in an Underserved Community
Mentor: Dr. Jessica Chacon, Ph.D.
Group 5
10:30AM

Abstract:
Background: Skin cancer rates continue to rise in underserved populations, particularly among Hispanics who often present with later-stage diagnoses. While photoprotective practices and regular skin examinations can mitigate risks, barriers such as limited dermatologist access and insufficient awareness persist. This study aimed to evaluate the effectiveness of a community-based educational intervention in improving skin cancer awareness and prevention behaviors in an underserved U.S.-Mexico border community.
Methods: We conducted a community-based educational intervention combining bilingual (English/Spanish) skin cancer education sessions with free skin screenings. Participants completed pre- and post-intervention surveys assessing knowledge, attitudes, and behaviors regarding skin cancer prevention. The intervention was conducted in El Paso, Texas, where 82.9% of the population is Hispanic. Surveys evaluated demographic information, skin cancer knowledge, and sun protection behaviors. Data were analyzed using unpaired t-tests, with significance set at $p<0.05$.
Results: Among 51 participants completing pre-surveys and 44 completing post-surveys, 80.39% identified as Hispanic. Following the intervention, participants showed significant improvement in skin cancer knowledge scores ($p=0.01741$). Confidence in sun protection practices increased from 72.55% to 100%. The proportion of participants planning to apply sunscreen to all sun-exposed areas rose from 54.17% to 72.09%, and intended use of sun-protective clothing increased from 80% to 95.24%. Notably, 22% of participants lacked health insurance, highlighting the importance of free screening initiatives.
Conclusion: This community-based intervention effectively improved skin cancer knowledge and prevention behaviors among participants in an underserved border community. The significant increases in both knowledge and intended preventive behaviors suggest that culturally appropriate, bilingual educational programs can successfully address gaps in dermatological care awareness and access. Future public health initiatives should prioritize similar outreach efforts to reduce the burden of ultraviolet-induced skin cancers in underserved populations.

2025 SARP SPRING SYMPOSIUM

Name: Moedjianto, Samuel
Classification: Y3
Project Title: Prevalence of an Identified Distal Radial Artery Variation Within the Willed Body Program Donors in the El Paso area.
Mentor: Heather Balsiger
Group 5
11:00AM

Abstract:
The radial artery plays a crucial role in vascular procedures like percutaneous coronary interventions and arteriovenous fistulas. While its anatomical course is well-documented, variations exist that may impact surgical and interventional outcomes. This study examines the prevalence of a distal radial artery variation in cadaveric donors from the TTUHSC El Paso Willed Body Program and potential correlations between these variations with sex and race/ethnicity using data from 27 cadavers (48 distal radial arteries). From these samples, two different variations on the course of the distal radial artery relative to the anatomical snuffbox and first dorsal interosseous muscle were observed. One artery coursed superficially over the anatomical snuffbox, while another bypassed the first dorsal interosseous muscle, with both found in White non-Hispanic donors. Statistical analysis using Fisher's exact test revealed no significant correlation between these variations and demographic factors ($p = 1.0$). With a 4.16% prevalence, routine preoperative screening based on sex or race/ethnicity is unnecessary. However, clinicians should remain aware of these variations, especially for clinicians performing vascular procedures. Further studies with larger sample sizes and clinical correlation is recommended.

2025 SARP SPRING SYMPOSIUM

Name: Patel, Anika
Classification: Y3
Project Title: LINAC-Based Stereotactic Body Radiation Therapy for Benign Tumors of the Skull Base
Mentor: Anna Lee M.D., MPH, Radiation Oncology Department, University of Texas MD Anderson
Group 5
11:30AM

Abstract:
The adjacent structures of tumors located in the skull base necessitate therapy that limits damage to non-targeted areas. The significance of the study was to determine if LINAC-based SBRT, a treatment that reduces the dose of radiation received by adjacent structures, improves patient outcomes. Every case included had either become symptomatic or had recorded tumor growth. Further, cases were surgically evaluated and referred to radiation therapy due to the surrounding cranial nerves. The variables that were measured included local control, defined as radiographic evidence of lack of progression, overall survival, state of pretreatment symptoms, and toxicity. The treated tumors were radiographically stable in all 30 patients treated for gross disease, and the patient treated adjuvantly remained disease free. Hearing loss and tinnitus were the most common reported pre-treatment symptoms. Seventeen patients (55%) reported an improvement in symptoms and 14 patients (45%) reported no worsening symptoms. Following treatment, there was 1 grade 1 tinnitus, 1 grade 2 facial nerve palsy and 1 grade 2 nausea but no grade 3 or higher toxicities. The findings of the study suggest that LINAC-based SBRT should be considered for treatment of benign tumors of the skull base as it allows for higher precision and can deliver high doses of radiation with reduced damage to surrounding structures.

2025 SARP SPRING SYMPOSIUM

Name: Raghuvir, Sanchayana
Classification: Y3
Project Title: Qualitative Assessment of Perceptions of Mesh Use for Pelvic Floor Surgery in a Latina Population: A Focus Group Study
Mentor: Pedro A. Maldonado M.D
Group 6
8:00AM

Abstract:
These elements comprise the most essential components of our visual identity. They define our appearance and are natural extensions of our unique character and personality.

Maintaining a consistent identity is critical to advancing our position among our competitors. It's the most fundamental principle we engage to build repetitive impressions and establish presence in the minds of our target audiences. These graphic standards and design guidelines are official policy of the Texas Tech University Health Sciences Center El Paso and should be followed with due diligence.

By being disciplined in the use of our core visual elements, professional graphic designers will ensure that every piece of communication carries with it the essential recognition that is so critical to enhancing and advancing TTUHSC El Paso brand image. Throughout the guidelines you'll find numerous examples of design solutions for a wide range of marketing and communication materials. Using our core visual elements and adhering to the fundamental concepts and design principles detailed in these guidelines will ensure that all of your solutions will be "on brand". You should approach these guidelines as you would a visual language. First master the basic pronunciation and vocabulary, then begin exploring all that can be said with its unique voice.

2025 SARP SPRING SYMPOSIUM

Name: Razvi, Samia
Classification: Y3
Project Title: Improving The Pediatric Resident Learning Experience via Hands-On Simulation: An Implementation Model
Mentor: Hugo Kato, MD
Group 6
8:30AM

Abstract:
Active learning methods are pivotal for information retention and skill acquisition. Project aimed to investigate the impact of medical simulations on the confidence and medical knowledge of pediatric residents. Participants completed a pre-simulation survey, participated in simulations of various medical cases, then completed post-simulation surveys. Pre-simulation, most residents felt uncomfortable with handling acute situations. Post-simulation, all reported improvement in confidence and medical knowledge. Supports further development and integration of simulation-based learning in the residency curriculum

2025 SARP SPRING SYMPOSIUM

Name: Sanchez, Nickolas
Classification: Y3
Project Title: Chronic Impact of Hormonal Contraceptives on Cognition in Older Women
Mentor: Alok Dwivedi, Ph.D.
Group 6
9:00AM

Abstract:
Recent studies on oral contraceptives have established an association between the utilization of estrogen and progesterone and improvement in cognitive function, but none of these studies have shown long term effects. This study assessed whether elderly women with a history of oral contraceptive or hormone use exhibited improved cognitive function compared to those who had never used oral contraceptives or hormones. Utilizing data from NHANES 2011-2014 database, cognitive performance was assessed using CERAD word list, intrusion word count, animal fluency, and digit symbol substitution tests. Results showed that women with OCP and/or hormone use had significant better score across all cognitive domains, including higher CERAD recall scores, greater verbal fluency, improved processing speed, and fewer memory intrusion errors. The results suggest that exposure to hormonal contraceptives and hormone therapy may have a long-term improvement in cognition later in life.

2025 SARP SPRING SYMPOSIUM

Name: Siby, Sharon
Classification: Y3
Project Title: Assessing the signaling pathways regulated by PSMD3 in AML by RNA sequencing
Mentor: Dr. Anna Eiring, The University of Texas at El Paso
Group 6
9:30AM

Abstract:
• Acute myeloid leukemia (AML) is a hematologic malignancy characterized by the excessive proliferation of immature myeloid cells due to various genetic alterations, including mutations in the FLT3 gene, which are associated with the poor prognosis and resistance to tyrosine kinase inhibitors (TKIs).
• The ubiquitin-proteasome system (UPS) regulates protein degradation and cellular processes, and the PSMD3 subunit has been implicated in AML oncogenesis through its role in stabilizing the NF-κB pathway.
• This study investigated the signaling pathways regulated by PSMD3 in FLT3- positive AML using RNA sequencing of three AML cell lines (MOLM-13, MOLM14, and MV-4-11) with small hairpin RNA (shRNA)-mediated PSMD3 knockdown.
• Our findings suggest that PSMD3 regulates immune and inflammatory pathways contributing to TKI resistance and AML progression, highlighting PSMD3 as a potential therapeutic target in FLT3-mutated AML.

2025 SARP SPRING SYMPOSIUM

Name: Trivedi, Meesha
Classification: Y3
Project Title: P2CKD (Prevent Progression of CKD)
Mentor: : Dr. Richard McCallum
Group 6
10:00AM

Abstract:
Chronic kidney disease (CKD) affects over 37 million Americans and is more prevalent in Hispanic populations, who face higher rates of diabetes mellitus type 2 (DM2), hypertension (HTN), and obesity—risk factors all overrepresented in the El Paso, Texas borderplex area. Barriers to care like insurance status and provider shortages further worsen outcomes. CKD often progresses silently to end-stage renal disease (ESRD), which requires costly and burdensome treatment. Early screening and consistent monitoring are essential. Telemedicine tools have shown promise in improving chronic disease management, especially in underserved communities.

2025 SARP SPRING SYMPOSIUM

Name: Valencia, Shane
Classification: Y3
Project Title: The Effect of Cannabis Dependence on the Thickness of the Left Entorhinal Cortex
Mentor: Dr. Hugo Sandoval Ph.D.
Group 6
10:30AM

Abstract:
With marijuana use becoming more common in the general population, it is important to study how its continued use might affect certain areas and functions of the brain. This study seeks to determine if there is a significant relationship between cannabis dependence and the thickness of the left and right entorhinal cortex, as well as the surface area, which overall play a significant role in learning and memory. Taking 30 subjects ages 20-30 years old with long marijuana use history, they were compared to 30 control subjects of the same age and similar demographic, psychiatric, and substance use history. The data for the thickness and surface area of the entorhinal cortices were compared from the Human Connectome Project. Overall, the results of the study demonstrated that long-term marijuana use has a significant negative relationship with the surface area of the left and right entorhinal cortices, but there was no significant relationship found with thickness. As this differs from previous research, more data would be needed to determine if this trend is supported under similar circumstances.

2025 SARP SPRING SYMPOSIUM

Name: Zakhireh, Bobak
Classification: Y3
Project Title: Impact of Vascular Surgery Service on Amputation Rates Among Trauma Patients at a Level 1 Trauma Center
Mentor: Dr. Aidinian, MD, Chief of Vascular and Endovascular Surgery TTUHSC El Paso
Group 6
11:00AM

Abstract:
The establishment of a formal Vascular Surgery service at University Medical Center El Paso on April 1, 2021, aimed to improve limb salvage rates in patients with extremity arterial trauma. This retrospective study analyzed adult trauma patients from 2016 to 2024, comparing amputation rates before and after the service's implementation. A total of 103 patients met inclusion criteria, with 51 treated before and 52 after the Vascular service launch. Both groups had similar demographics, comorbidities, injury characteristics, and treatments. Of the nine patients who required amputations, 77.8% occurred before the Vascular Surgery service was introduced. These findings suggest that establishing a dedicated Vascular Surgery service may be associated with improved limb salvage rates in trauma patients.

ABSTRACTS
April 8
1:15 p.m. – 5:15 p.m.

Name: Zhao, Ted
Classification: Y3
Project Title: Title: Mental and behavioral health crises in the PICU: A multi-institutional case series and integrative literature review (Focus on Gaps in Evidence Based Medicine)
Mentor: Mentor: Dr. Avi Kopstick, MD
Group 7
1:15pm

Abstract:
Pediatric intensive care units (PICU) have been challenged by more admissions related to patients with mental and behavioral health crises (MBHC). With limited psychiatric training, PICU providers have been challenged with the management of such patients. This study aimed to analyze six communities of practice to construct an initial framework for management of these patients and to describe possible solutions for improved care. 96 articles were selected out of 397 sampled articles pertaining to, “pediatric psychiatric boarding.” The articles were then split into six communities of practice: 1) emergency medicine; 2) pediatric hospitalist medicine; 3) inpatient psychiatry; 4) pediatric and adult ICU; 5) community and publish health; and 6) participant viewpoints. The authors collected data per article and results were synthesized into themes. This poster describes the results regarding the theme: Gaps in Evidence Based Medicine. Overall, the study shows management of MBHC in the PICU are a unique challenge that warrants further investigation to develop solutions aimed for personalized, trauma-informed care.

2025 SARP SPRING SYMPOSIUM

Name: Zia, Fayha
Classification: Y3
Project Title: ADD/ADHD medication adherence association with race and ethnicity
Mentor: Dr. Sarah Martin
Group 7
1:45pm

Abstract:
ADHD is a common neurodevelopmental disorder as it affects 8-12% of children in the US. However, racial and ethnic disparities exist in ADHD diagnosis and medication adherence. This study investigates prevalence of ADD/ADHD medication adherence amongst different ethnicities and races using data from the 2022 National Survey of Children's Health. The dataset includes information on medication adherence among children aged 3–17, categorized by race/ethnicity, and was analyzed using descriptive statistics and multivariate adjustments for household income, sex, education level, and child age. Results showed White and Black populations of children diagnosed with ADD/ADHD have a greater positive correlation with ADD/ADHD medication adherence than Asian and other populations. Despite higher overall adherence rates among Hispanic and Asian children, adjusted analyses indicate complex associations influenced by cultural beliefs, parental perceptions, and healthcare experiences. These findings can be due to many cultural factors and require contextualization for the reasoning behind the differing rates amongst ethnicities. Further research is required to explore the cultural factors for differing ADD/ADHD medication adherence among different races and ethnicities. The significance of this study is that ADD/ADHD medication is linked to improved long-term outcomes for these children, better school performance, decreased criminality, decreased risk of substance, and decreased risk for concurrent depression. Learning about culturally informed differences in medication adherence would help to better improve medication adherence across different cultures by tailoring the patient education strategies and treatment plans.

2025 SARP SPRING SYMPOSIUM

Name: Augustain, Bianca
Classification: Y4
Project Title: Evaluating the Understanding of Suicide and Access to Emergency Mental Healthcare Resources in the Sparks Community
Mentor: Dr. Maureen Francis
Group 7
2:15pm

Abstract:
Since the COVID-19 pandemic, mental health disorders and awareness have increased across the United States. In the Hispanic population, particularly, mental health continues to have a stigma associated with it, impacting awareness and access to resources. This study seeks to evaluate the knowledge of risk factors, warning signs, and emergency mental health resources in the Sparks community of El Paso and provide education and resources to improve awareness. The importance of the study is to understand the community better and provide information for both healthcare providers and patients alike about the awareness and understanding of suicide and emergency mental healthcare access and whether an intervention providing these resources improves mental health literacy.

2025 SARP SPRING SYMPOSIUM

Name: Borrego, Andre
Classification: Y4
Project Title: Healthy Food Financing Initiative
Mentor: Gabriela Gallegos J.D., M.P.P. Associate professor of Management, Policy, and Community Health at UTHealth Houston School of Public Health
Group 7
2:45pm

Abstract:
Food access is a key determinant of health, particularly in communities with limited economic resources. While much attention has been given to “food deserts”—areas lacking access to affordable and nutritious food—other geographic and socioeconomic factors also contribute to disparities in food availability and pricing. Residents of underserved zip codes may rely on smaller, less competitive stores, often paying more for staple items due to limited grocery store presence and reduced consumer choice. In urban and rural border communities like El Paso County, Texas, understanding the local food environment is essential. Prior studies have shown that neighborhood-level differences in income, store types, and transportation can all influence where and how people shop. However, there is limited zip-code-level data linking household income directly to food affordability in this region.
This study seeks to examine whether there is a statistically significant relationship between household income and the cost of staple food items in El Paso. By comparing food prices across zip codes and analyzing affordability through a normalized cost index, this project aims to shed light on the role income plays in shaping local food accessibility.

2025 SARP SPRING SYMPOSIUM

Name: Cardenas, Joshua
Classification: Y4
Project Title: Anatomical Anomalies in the Brachial Plexus and Axillary Artery a Cadaveric Study
Mentor: Dr. Belmares, UTRGV
Group 7
3:15pm

Abstract:
The brachial plexus, a complex neural network responsible for upper limb innervation, exhibits numerous anatomical variations with significant clinical implications. This study aimed to observe and analyze variations in the cords and terminal branches of the brachial plexus to enhance the understanding of these anomalies and their potential impact in clinical and surgical settings. A total of ten formaldehyde-embalmed cadavers were dissected and analyzed, focusing on variations in nerve origin, branching patterns, and communications. Additionally, measurements of the five main terminal branches and the axillary artery were recorded. The findings revealed that 15% of the sample exhibited variations involving the median nerve, while 10% exhibited variations involving the musculocutaneous nerve. The most common anomaly was a communicating branch between the median and musculocutaneous nerves, observed in 10% of the upper extremities. Additionally, in 5% of the sample, the lateral cord provided two branches to the median nerve. A Welch t-test comparing the mean lengths of the left and right axillary arteries found no statistically significant difference. While these results contribute to existing anatomical knowledge, the small sample size limits broad generalizability. Future studies should employ larger sample sizes and standardized methodologies to facilitate meta-analyses and refine our understanding of brachial plexus variations.

2025 SARP SPRING SYMPOSIUM

Name: Carlson, Timothy
Classification: Y4
Project Title: Discordance Between Cytology and Cervical Biopsy Specimens Among Different Age Groups
Mentor: Dr. Osvaldo Padilla
Group 7
3:45pm

Abstract:
Cervical cancer screening through cytologic sampling has long been a cornerstone of preventive care. However, its diagnostic accuracy may vary across age groups due to anatomical and hormonal changes. In older women, the transformation zone often retracts into the cervical canal, and epithelial atrophy becomes more common. These changes may limit the sensitivity of cytologic screening. This study aimed to evaluate whether menopausal status affects the concordance between cervical cytology and histology by comparing the frequency of upgraded and downgraded diagnoses between premenopausal and postmenopausal women.
A retrospective chart review was conducted using data from a single academic institution. A total of 41 patients with discordant cytology and histology results from the year 2021 were included. Patients were categorized into premenopausal (n=19) and postmenopausal (n=22) groups. For each patient, cervical cytology and biopsy results were reviewed and categorized as either upgraded, downgraded, or concordant. Statistical analysis using the Chi-square test was performed to determine if a significant association existed between menopausal status and the likelihood of diagnostic discrepancy.
The analysis yielded a Chi-square statistic of 1.6 with a p-value greater than 0.05, indicating no statistically significant association between menopausal status and rates of upgraded or downgraded diagnoses. These results suggest that menopausal status may not significantly impact the diagnostic concordance between cytologic and histologic findings.
While this study did not find a significant difference between groups, it highlights the importance of continuously evaluating the effectiveness of cervical cancer screening protocols across different patient populations. Future research with larger sample sizes and more diverse demographics may help further clarify whether menopausal status influences diagnostic accuracy in cervical cancer screening.

2025 SARP SPRING SYMPOSIUM

Name: Changlani, Nikita
Classification: Y4
Project Title: The Impact of COVID-19 on Patient Violence in Psychiatric Hospitals
Mentor: Dr. Silvina Tonarelli
Group 7
4:15pm

Abstract:
Workplace violence in inpatient psychiatric hospitals remains a significant concern. This study examined whether psychiatry residents and program directors perceived an increase in patient violence during the COVID-19 pandemic and explored contributing factors. A survey was distributed to all ACGME-accredited psychiatry residency programs in the U.S., yielding 151 responses (130 residents and 21 program directors).
Findings indicate that 56% of psychiatry residents experienced patient violence during inpatient rotations, with verbal assaults being the most common. Additionally, 63% of residents reported feeling unsafe or unprotected in psychiatric units. Contrary to expectations, 74% of residents and 80% of program directors did not perceive an increase in patient violence due to the pandemic. However, staffing shortages were a prevalent concern, with 63% of residents and 57% of program directors reporting inadequate staffing since the pandemic's onset.
These results suggest that while patient violence remains a persistent issue, the pandemic may not have directly increased its occurrence. Instead, staffing shortages and safety policies may be key contributing factors. Future research should focus on interventions to improve staffing and enhance safety measures, ensuring a safer work environment for psychiatry residents and healthcare professionals in inpatient psychiatric settings.

2025 SARP SPRING SYMPOSIUM

Name: Cottam, Samuel
Classification: Y4
Project Title: Comparative analysis of sleeve conversions of the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program 2020 Database
Mentor: Amit Surve, Bariatric Medicine Institute of Utah
Group 8
1:15pm

Abstract:
Background: Although the sleeve gastrectomy (SG) is the dominant bariatric procedure, studies have shown conversion rates of up to 30%. These conversions are generally for weight regain (WR), insufficient weight loss (IWL) or gastroesophageal reflux disease (GERD). Before 2020, details on why con- versions were being performed were not collected in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) Participant Use Data File (PUF). Now, the indication for sleeve conversion is noted in the PUF, allowing identification and reporting sleeve conversion reasons. Objective: We aimed to examine the reasons for SG conversions nationwide.
Setting: The 2020 MBSAQIP PUF.
Methods: The 2020 MBSAQIP PUF was examined to determine the reasons why SG were converted to other operations. The data field of “Revision/Conversion Final Indication” was used along with “Procedure type.” Primary bariatric operations were excluded. Descriptive statistics were applied. Different reasons for conversion and operations were compared by preoperative characteristics and operative outcomes.
Results: There were 103,782 primary SG reported in the 2020 PUF. There were 7181 SG that were converted to other operations. The most common conversion (86.2%) was to Roux-en-Y gastric bypass (RYGB). The main reason for SG conversion was GERD at 48.4%, followed by WR/IWL (41.9%). Biliopancreatic diversion with duodenal switch and single-anastomosis duodenoileal bypass with sleeve patients differed significantly from RYGB patients in specific preoperative characteristics and operative outcomes.
Conclusion: The most common procedure SG is converted to is the RYGB. GERD was the most common reason for SG conversion, followed by WR/IWL.

2025 SARP SPRING SYMPOSIUM

Name: Delgado, Reagan
Classification: Y4
Project Title: Early Metabolic Imbalance as an Independent Risk Factor for Incident Metabolic Syndrome: A Retrospective Cohort Study
Mentor: Dr. David Cistola, MD, PhD
Group 8
1:45pm

Abstract:
EMI is a hidden condition that includes compensated insulin resistance (IR), hyperinsulinemia, oxidative stress, hypoxia, and inflammation.
The high circulating insulin compensates for insulin resistance, such that fasting glucose, triglycerides, hemoglobin A1c, and high-density lipoprotein-cholesterol (HDL-C) all remain within normal limits. Individuals with EMI do not meet the criteria for prediabetes or metabolic syndrome (MetS).

2025 SARP SPRING SYMPOSIUM

Name: Evans, Dewitt
Classification: Y4
Project Title: Isolated Medial Malleolar Fractures in the Skeletally Immature
Mentor
Mentor: Dr. Norman Ward
Group 8
2:15pm

Abstract:
This systematic review evaluates clinical outcomes associated with various surgical interventions for isolated medial malleolar fractures (MMF) in pediatric patients. A comprehensive search of MEDLINE and CINAHL databases (2012-2022) identified seven studies meeting inclusion criteria, analyzing a total of 642 patients. Open reduction with internal fixation (ORIF) was the most reported intervention, utilizing bioabsorbable screws, traditional screws, and Kirschner wires.

The review revealed significant gaps in reporting, particularly regarding intraoperative and acute postoperative complications. Among the 127 patients with documented long-term outcomes, complications included physeal bar formation (30.7%), premature growth plate arrest (5.5%), and deformities requiring corrective procedures (7.1%). Early-onset arthritis affected 5.5% of patients. Despite these risks, some studies reported favorable functional outcomes following surgical management. The findings emphasize the need for long-term follow-up studies to optimize patient care. Future research should focus on comparative outcomes of different fixation methods and the role of conservative management. By addressing these gaps, clinicians can improve decision-making for pediatric patients with MMFs.

2025 SARP SPRING SYMPOSIUM

Name: Factoriza, Chris Ronald
Classification: Y4
Project Title: Consideration of PGRMC1 as a potential oncogene marker via analysis of expressivity and mortality of subjects with cancer
Mentor: Dr. Rajkumar Lakshmanaswamy
Group 8
2:45pm

Abstract:
Progesterone Receptor Membrane Component 1 (PGRMC1) has emerged as a protein of interest due to its potential role in cancer progression and prognosis. Previous studies have implicated PGRMC1 in multiple cellular functions, including extracellular matrix structuring, lipid metabolism, and cytochrome p450 enzyme stabilization. Additionally, PGRMC1 has been linked to various cancers, including breast, ovarian, lung, liver, and renal carcinomas, with its overexpression often correlating with tumor progression and poor prognosis. Recent findings have further suggested its involvement in Kidney Renal Cell Carcinoma (KIRC), where its expression levels appear to impact cancer severity and patient survival. This study aims to evaluate PGRMC1 as a potential diagnostic and prognostic biomarker in cancer by analyzing its expression across various cancer types using bioinformatics databases. The University of ALabama at Birmingham CANcer data analysis (UALCAN) and Gene Expression Profiling Interactive Analysis (GEPIA2) platforms, which utilize data from The Cancer Genome Atlas (TCGA) and Genotype-Tissue Expression (GTEx), were used to assess PGRMC1 expression levels and their correlation with patient survival. Statistical analyses, including Student's t-tests for expression levels and Kaplan-Meier survival curves with log-rank tests, were employed to identify significant associations. Results demonstrated variable expression of PGRMC1 across different cancer types, with significant differences observed in cholangiocarcinoma, esophageal carcinoma, glioblastoma multiforme, and head and neck squamous cell carcinoma. Survival analysis revealed that high PGRMC1 expression correlated with poorer survival in certain cancers but improved prognosis in KIRC, highlighting a potential context-dependent role. However, discrepancies between UALCAN and GEPIA2 data suggest the need for further experimental validation. These findings underscore the complexity of PGRMC1's involvement in cancer and emphasize the need for further investigation into its functional mechanisms. Future studies incorporating in vitro and in vivo analyses will be crucial to confirming PGRMC1's potential as a reliable biomarker for cancer diagnosis and prognosis, as well as its suitability as a therapeutic target.

2025 SARP SPRING SYMPOSIUM

Name: George, Sonya
Classification: Y4
Project Title:
Mentor:
Group 8
3:15pm

Abstract:
HPV vaccination rates in the Hispanic community improved with public health efforts but declined during the COVID-19 pandemic, exacerbating health disparities. In a Texas border community, first-dose HPV vaccine uptake dropped from 89.92% pre-pandemic to 69.59% during and 76% post-pandemic. After adjusting for confounders, odds of vaccination remained significantly lower ($p < 0.001$). This suggests the pandemic significantly impacted HPV vaccine uptake despite a comprehensive intervention program.

2025 SARP SPRING SYMPOSIUM

Name: Griffith, Shauna
Classification: Y4
Project Title: Remodeling Potential of the Skeletally Immature Tibia: What Variables Impede Non-Operative Treatment?
Mentor: Dr. Norman Ward
Group 8
3:45pm

Abstract:
With the incidence of pediatric trauma increasing in recent years, it is now more important than ever to not only understand treatment indications, but also patient characteristics and how they can affect intervention and outcomes. For adult long bone tibial fractures as well as pediatric radial fractures there are guidelines for fracture healing that create the basis for treatment throughout healing progression. Despite this, there remains no definitive guidelines for when to move from non-operative to operative tibial fracture management the skeletally immature population. To fill this gap, we aimed to calculate a pre-treatment varus/valgus deformity that might indicate future non-operative treatment failure as well as investigate the demographic or fracture characteristics that impact treatment outcomes. We performed a retrospective chart review that allowed us to obtain data from 42 skeletally immature fractures. We concluded that fractures with a higher degree of varus curvature fared worse during non-operative management. Additionally, those with a low energy mechanism of injury and those with simple (vs complex) fractures were more likely to have successful non-operative management. While our data supports previous literature and suggests a correlation in these factors and successful non-operative management, more research is needed on the subject in order to create definitive treatment guidelines.

2025 SARP SPRING SYMPOSIUM

Name: Guzman, Alan
Classification: Y4
Project Title: Exploring the Trends, Perceptions, and Impacts of Medical Spanish integrated in a Medical School
Mentor: Dr. Nathan Holland, Ph.D.
Group 8
4:15pm

Abstract:
Undergraduate medical education (UME) is extremely dynamic and is derived from internal, external factors and many other aspects.1 Hispanics are the largest minority in the United States accounting with over 63 million individuals that reside in the U.S.2 Adding to this, 25 million people in the U.S. are limited English proficiency (LEP) with Hispanics taking up 62% of those 25 million people.3 Individuals who are LEP are at higher risk for health disparities.3,4
At Texas Tech University HSC El Paso (TTUHSC EP) Paul L. Foster School of Medicine (PLFSOM) we aim to reduce the burden of LEP for Spanish speaking patients. The curriculum is set for medical students to be enrolled in a two-year medical Spanish as part of their pre-clerkship Society, Community and The Individual (SCI) course. Additionally Due to the location of our medical program, this medical Spanish acts as a springboard since Spanish is heavily during the clerkship phase and the abundance of volunteering sites.

2025 SARP SPRING SYMPOSIUM

Name: Hong, Daewoo
Classification: Y4
Project Title: Effect of Metformin on Glioblastoma Cell Viability
Mentor: Dr. Jorge Cervantes
Group 8
4:45pm

Abstract:
Glioblastoma Multiforme (GBM) is the most common primary brain tumor associated with poor prognosis with an average survival of approximately 15 months. Some of the traits that make GBM difficult to treat are its highly invasive growth, rapid angiogenesis, and its local immunosuppressive effect. Although several clinical trials have shown promising results, antineoplastic drugs have yet to yield any significant improvement in the overall survival of patients diagnosed with GBM.
Metformin, a well-known medication used for treating Diabetes Mellitus, has emerged as a potential therapeutic agent in the treatment of GBM. Metformin was originally designed to be manufactured as an antiviral treatment for influenza and its antidiabetic property was incidentally discovered as one of its side effects. Since its discovery, it has been used as the gold-standard treatment for type 2 diabetes mellitus (T2DM). Additionally, Metformin was also discovered to influence immune response by reducing the production of pro-inflammatory cytokines by macrophages and neutrophils.
Several studies have shown that metformin has anti-neoplastic effects by inhibiting the GBM cell growth and augmenting the therapeutic response to other antineoplastic medications. Furthermore, retrospective studies have shown improved survival in patients treated with Metformin.
My main goal was to determine if there was a connection between Metformin's immunomodulatory effects and GBM cell viability and to further explore Metformin's potential as a therapeutic agent for treating GBM.

2025 SARP SPRING SYMPOSIUM

Name: Ismail, Yousef
Classification: Y4
Project Title: Evaluating the Antimicrobial Effect of Titanium Dioxide (TiO_2) Nanoparticles on Surgical Sutures to Prevent Postoperative Infections
Mentor: Dr. Jorge Cervantes, Nova Southeastern University Fort Lauderdale
Group 9
1:15pm

Abstract:
Postoperative infections, often caused by Staphylococcus aureus and Staphylococcus epidermidis, present a significant clinical burden. These pathogens are known for their ability to form antibiotic-resistant biofilms, particularly on surgical devices. Titanium dioxide (TiO_2) nanoparticles have demonstrated antimicrobial and biofilm-disrupting properties. This project aimed to evaluate the efficacy of TiO_2-coated surgical sutures in reducing bacterial growth. Sutures were treated with TiO_2 nanoparticles and potassium hydroxide (KOH), with and without UV activation, and tested against S. aureus and S. epidermidis on agar plates. Results showed that TiO_2 + KOH inhibited S. epidermidis regardless of UV activation. However, inhibition of S. aureus was only observed with UV-activated TiO_2, highlighting a differential response. These findings support the potential application of TiO_2-coated sutures in preventing postoperative infections, particularly when UV activation is feasible.

2025 SARP SPRING SYMPOSIUM

Name: Kandru, Namratha
Classification: Y4
Project Title: Systematic Review: Quality Improvement Initiatives in Student-Run Free Clinics
Mentor: Gregory Patek
Group 9
1:45pm

Abstract:
Background: This review highlights the essential role of quality improvement (QI) initiatives in enhancing patient care and medical education in student-run free clinics (SRFCs). It systematically analyzes the varying implementation of QI practices across different SRFC models, identifying common challenges and strategies. The findings provide valuable insights to optimize QI initiatives, improving clinic efficiency, patient outcomes, and the training of future healthcare providers.
Aim: To examine the implementation of quality improvement (QI) initiatives in student-run free clinics (SRFCs), analyze the challenges associated with these efforts, and identify strategies to optimize patient care and medical education.
Methods: A systematic Google Scholar search identified 33 relevant studies on quality improvement in U.S. student-run free clinics. Data were analyzed thematically to identify key strategies, challenges, and outcomes.
Results: QI initiatives in SRFCs address operational and clinical challenges, with key themes including preventive care, workflow efficiency, follow-up communication, student training, specialty care, and health education.
Discussion: This review highlights the critical role of quality improvement (QI) initiatives in student-run free clinics (SRFCs) and their potential to enhance patient care, streamline operations, and improve medical training. By identifying best practices and persistent challenges, this work contributes to the existing body of knowledge by offering strategies for sustainable QI implementation in SRFCs. Future efforts should focus on standardizing training, expanding specialty care access, and leveraging technology to improve clinic efficiency and patient outcomes.

2025 SARP SPRING SYMPOSIUM

Name: Ku, Morgan
Classification: Y4
Project Title: The Effect of Parental Bipolar I Disorder on Offspring BMI
Mentor: Dr. Sarah Martin
Group 9
2:15pm

Abstract:
Children of parents with Bipolar I Disorder (BP-I) face increased risks for both psychiatric and somatic health conditions, yet the relationship between parental BP-I and offspring body mass index (BMI) remains underexplored. This study investigates the association between parental BP-I and BMI classification in offspring, utilizing data from the Early Interventions for Bipolar Disorder and Schizophrenia in At-Risk Youth (EIS) study. A retrospective cohort of 274 participants aged 6–20 years from El Paso County, surrounding border regions, and Bexar County was analyzed. BMI categories included underweight, normal weight, overweight, and obese. Statistical analyses using chi-square tests and multivariable relative risk regression models identified significant associations between maternal BP-I and offspring BMI. Findings revealed that children with a mother diagnosed with BP-I had a higher risk of being underweight (RR = 3.16, $p < 0.001$) and obese (RR = 4.29, $p = 0.01$). Additionally, offspring with at least one BP-I parent showed an increased likelihood of being underweight (RR = 2.98, $p < 0.001$) and obese (RR = 2.86, $p = 0.03$), whereas no significant association was found for paternal BP-I alone. These results suggest that maternal BP-I may contribute to both ends of the BMI spectrum in offspring, highlighting the need to integrate parental mental health considerations into pediatric weight management strategies. Further research should explore the genetic, behavioral, and environmental mechanisms linking BP-I and BMI variations in children.

2025 SARP SPRING SYMPOSIUM

Name: Liang, Todd
Classification: Y4
Project Title: Human Connectome: Neuroanatomical Changes Associated with Depression
Mentor: Dr. Hugo Sandoval, Ph.D
Group 9
2:45pm

Abstract:
Major depressive disorder (MDD) is a serious mental illness growing in prevalence every single year with more than 300 million people worldwide suffering depression according to World Health Organization's statistics.2 This condition is characterized by persistent low mood, often accompanied by cognitive dysfunction, physical symptoms, and impaired social function.1 Currently, the diagnosis of depression is made based on clinical manifestations, with little objective evidence.2 Although depression is the leading cause of disability around the world, but little is known about its pathology. 2
Magnetic resonance imaging (MRI) has been widely applied to identify the key brain regions implicated in the pathophysiology of MDD and has revealed functional abnormalities in a distributed network of brain regions known to play a role in mood regulation.1 The results are inconsistent and controversial because of the different demographic and clinical characteristics. However, some regions overlapped; thus, we think that there may be a "hub" in MDD and that an impairment in these regions contributes to disease severity.2 Characterizing neuroanatomical changes may help further clarify the pathogenesis and etiology of this poorly characterized condition and may assist in diagnosis and assessing disease severity.
Both the hippocampus and amygdala play a large role in emotional processing and regulation. Literature has consistently shown that both the hippocampus and amygdala decrease in volume and atrophy overtime in those with depression. As depression is a mental illness characterized by a criterion of symptoms including low mood and anhedonia, this project examines the neuroanatomical volumes of specifically the hippocampus and amygdala.

2025 SARP SPRING SYMPOSIUM

Name: Loya, Alejandro
Classification: Y4
Project Title: Exploring Causes of Texas Hispanic Children's Decreased Access to Healthcare per the 2021-
2022 National Survey of Children's Health
Mentor: Dr. Sarah L. Martin
Group 9
3:15pm

Abstract:
This study investigates healthcare access disparities among Hispanic children in Texas, with a focus on barriers such as insurance status, socioeconomic factors, and cultural challenges. Using data from the 2021-2022 National Survey of Children's Health, this analysis compares healthcare access indicators between Hispanic and non-Hispanic White children. Key findings highlight significant discrepancies, with Hispanic children reporting less access to both preventative and specialist care. Statistical analysis revealed that Hispanic children are less likely to have health insurance, particularly private coverage, and more likely to face barriers in accessing specialist care. The study also identifies that public health insurance is more prevalent among Hispanic children, though this fails to overcome the disparities in healthcare access. These results show the multifactorial nature of healthcare disparities, where socioeconomic factors and insurance status are primary contributors. The findings align with existing literature but also suggest that targeted policy changes aimed at improving insurance coverage for Hispanic children could help reduce these disparities. Further research is needed to explore additional barriers, such as language and transportation, and to evaluate the long-term impacts of limited healthcare access.

2025 SARP SPRING SYMPOSIUM

Name: Malize, Nickolas
Classification: Y4
Project Title: Early Metabolic Imbalance is a Risk Factor for Incident Pre-Diabetes: CARDIA 30 Year Follow Up
Mentor: Dr. David Cistola
Group 9
3:45pm

Abstract:

- EMI is an overlooked condition characterized by compensated insulin resistance (IR), where fasting glucose, triglycerides (TG), hemoglobin A1c (A1c) and high-density lipoprotein cholesterol (HDL-C) are all within normal limits (WNL); Fig. 1, yellow zone
- High circulating insulin compensates for insulin resistance. Thus, individuals with EMI do not meet the criteria for prediabetes (PreD) or metabolic syndrome (MetS).
- Previously, we reported that EMI is an independent risk factor for type 2 diabetes (T2D) and atherosclerotic cardiovascular disease (ASCVD).

2025 SARP SPRING SYMPOSIUM

Name: Matuk, Daniella
Classification: Y4
Project Title: Nutritional delivery to children with chronic feeding difficulties in the PICU: A single-site, retrospective case control study
Mentor: Avi J. Kopstick
Group 9
4:15pm

Abstract:
Study Objective: To evaluate the impact of chronic medically administered hydration and nutrition (MAHN) on time to full enteral feeding and clinical outcomes in critically ill children.
Study Findings: Patients with prior MAHN use experienced longer times to achieve full enteral nutrition, higher rates of hospital-acquired infections, prolonged PICU stays, and increased mortality compared to controls.
Study Conclusion: Children with chronic MAHN histories may require specialized nutritional interventions to optimize recovery and reduce complications.

2025 SARP SPRING SYMPOSIUM

Name: Mcclain, Mitchell
Classification: Y4
Project Title: Efficacy of Steroid Injections for Knee Osteoarthritis
Mentor: Evan Corning, MD
Group 9
4:45pm

Abstract:
The number of patients with osteoarthritis in the United States is a large population and continues to grow on an annual basis. This holds true for the patient in El Paso as well, however a key difference in El Paso is the high proportion of predominately Hispanic patients receiving care. Providing orthopedic care to this specific population thus offers a chance to provide more information about the care of a minority population that can inform other providers and the rest of the country that may not be regularly exposed to this patient population. We would like to retrospectively evaluate charts for the number of injections that patients received prior to moving onto surgical intervention in Hispanic vs non-Hispanic patients stratifying by categories such as age group and risk factors/comorbidities. We will then utilize statistical packages for the social sciences (SPSS) to draw conclusions that will be able to guide the care of osteoarthritis patients in the future.

2025 SARP SPRING SYMPOSIUM

Name: McElhiney, Elizabeth
Classification: Y4
Project Title: Advancing the Landscape Increasing Diversity in Clinical Trials
Mentor: Dr. Jessica Chacon, PhD
Group 10
1:15pm

Abstract:
Latinos make up a small percentage of clinical trial participants with an estimated 5% of clinical trial participants being Latino. Therefore, there is a need for more connection or accessibility of these trials to this community. Promotoras or Community Health Workers (CHW), which is a term documented since the 1970s, have had a major role in connecting the community to health care opportunities- like clinical trials- through education and outreach. However, there has been a disconnect between the CHWs and clinical trials in various communities.

2025 SARP SPRING SYMPOSIUM

Name: Mosaffa, Sara
Classification: Y4
Project Title: Birthweight and Development of Psychiatric Disorders
Mentor: Dr. Sarah Martin
Group 10
1:45pm

Abstract:
This study examined the relationship between low birthweight and the prevalence of various mental, emotional, developmental, and behavioral conditions in children ages 3-17. Data was obtained from the 2022 National Survey of Children's Health, via a survey conducted by the U.S. Census Bureau. Birthweight was measured against the presence of any of the 10 mental, emotional, developmental and behavioral conditions. The associations between psychiatric disorders and birthweight categories were assessed using chi-square tests for each psychiatric diagnosis. The findings reveal that children born with low birthweight exhibited a higher prevalence of anxiety, behavioral and conduct problems, developmental delay, intellectual disabilities, speech disabilities, learning disabilities, autism spectrum disorder, and attention-deficit/hyperactivity disorder compared to their normal birthweight peers. The results call for further research to better understand the underlying mechanisms driving these associations, as well as to explore the effectiveness of early therapeutic interventions in preventing these conditions.

2025 SARP SPRING SYMPOSIUM

Name: Muncrief-Saldivar, Sebastian
Classification: Y4
Project Title: Exploring Disparities in Strength Training Among Elderly Populations in El Paso
Mentor: Dr. Dale Quest
Group 10
2:15pm

Abstract:
Resistance training offers well-documented health benefits, yet participation declines with age and remains disproportionately low in older adults, particularly in Hispanic communities. This project explored disparities in strength training participation across Texas, focusing on demographic changes in El Paso's aging population. Secondary data analysis from state and city databases revealed that only 5.9% of Texans aged 65+ meet strength training guidelines. El Paso, where 82% of the population identifies as Hispanic, has seen its elderly population grow rapidly in the last five years, with a 30% increase in those aged 70–74. Given the increased risk of falls and frailty-related mortality in this group, these trends represent a serious public health concern. The findings highlight the critical role of clinicians in promoting strength training through tailored counseling, reframing exercise risks, and fostering motivation in culturally relevant ways. This poster proposes clinician-led strategies based on motivational and behavioral science principles to address these gaps and improve strength training adherence in older adults.

2025 SARP SPRING SYMPOSIUM

Name: Nguyen, Maianh
Classification: Y4
Project Title: REPORT: Effect of Initiating HPV Vaccination Before Age 11 on HPV Vaccination
Mentor: Dr. Jennifer Molokwu, M.D., M.P.H
Group 10
2:45pm

Abstract:
Human papillomavirus (HPV) is linked to cancers of the cervix, penile shaft, anus, and oropharynx. HPV vaccines have reduced the prevalence and incidence of human papillomavirus (HPV) infection and have protected against HPV-associated cancers.
The vaccine is FDA-approved to start at age 9 but is placed on the immunization schedule at the 11-year well-child check and is most effective when administered before HPV exposure.

2025 SARP SPRING SYMPOSIUM

Name: Pride, David
Classification: Y4
Project Title: Evaluation of disinfectant efficacy in medical simulation center materials
Mentor: Dr. Scott Crawford, M.D.
Dale Quest, PhD
Group 10
3:45pm

Abstract:
Simulation models are widely used in teaching venipuncture and IV insertion in a “risk-free” environment which does not put learner or patient in harm’s way. An issue with these models is that they are often composed of plastic tubing which is prone to microbial contamination subsequent costly damage. To our knowledge, there has not been a systematic assessment of disinfectant efficacy on these materials. The knowledge of different disinfectants on simulation center materials can help in devising best practice for the use and durability of simulation equipment.

2025 SARP SPRING SYMPOSIUM

Name: Rainey, Michael
Classification: Y4
Project Title: Pilon Fractures: A Narrative Review
Mentor: Dr. Rajiv Rajani
Group 10
4:15pm

Abstract:
Tibial plafond (pilon) fractures pose a significant challenge due to the fractures involving articular destruction, metaphyseal comminution, and soft tissue injury. This narrative review was conducted following PRISMA guidelines with the aim to create an up-to-date resource for those managing pilon fractures. A total of 60 articles met inclusion criteria. There are a variety of treatment options the operative surgeon may consider, each with unique advantages and disadvantages. However, regardless of the chosen treatment method, careful consideration of soft tissue management is crucial in all cases. Given the complexity of these injuries, literature recommends a multidisciplinary approach to management. This should involve close collaboration between orthopedic surgeons, plastic surgeons, physical therapists, and other relevant specialists

2025 SARP SPRING SYMPOSIUM

Name: Rhodes, Benjamin
Classification: Y4
Project Title: Immunohistochemical Expression Patterns of PitNETs using Tissue Microarrays
Mentor: Dr. Jonathan Lavezo
Group 11
1:15pm

Abstract:
The pituitary gland gives rise to numerous neoplastic processes, classified into four main types by the WHO Classification of Endocrine Tumours, 5th edition: anterior lobe (adenohypophyseal) tumors, posterior lobe (neurohypophyseal) tumors, hypothalamic tumors, and other sellar region tumors. Among these, anterior lobe tumors, known as pituitary neuroendocrine tumors (PitNETs), are the most common (1). PitNETs consist of neoplastic proliferations of hormone-secreting neuroendocrine cells and, while mostly benign, can cause clinical syndromes like Cushing's disease, acromegaly, and hyperprolactinemia if they produce excess hormones(2). Larger PitNETs may also cause mass-effect symptoms such as headaches and vision changes (1,3).
Immunohistochemistry (IHC) is the gold standard for identifying PitNET cell-lineage and tumor types, using markers like ACTH, FSH, GH, LH, prolactin, and TSH, along with transcription factors like PIT1, SF1, GATA3, ER, and TPIT (4). PitNETs are categorized by adenohypophyseal cell-lineage into three groups: PIT1-lineage (lactotrophs, mammosomatotrophs, somatotrophs, thyrotrophs), TPIT-lineage (corticotrophs), and SF1-lineage (gonadotrophs). Further classification of lactotroph, somatotroph, and corticotroph tumors into sparsely and densely granulated types is based on IHC staining patterns (4,5). Despite the clear framework for PitNET classification, the lack of comprehensive studies on IHC expression patterns in previously diagnosed tumors and the evolving 2022 WHO classification pose challenges for accurate evaluation and treatment. Understanding these patterns is crucial for better clinical management and directed medical therapy after tumor resection (2). This project aims to identify distinct IHC staining patterns of PitNET subtypes using tissue microarrays, with the long-term goal of informing future research and identifying potential biomarkers or therapies through RNA sequencing data.

2025 SARP SPRING SYMPOSIUM

Name: Ricks, Emily
Classification: Y4
Project Title: Determining the physical, hormonal, and metabolic markers of females having features of polycystic ovary syndrome: A retrospective chart study
Mentor: Dr. Pallavi Dubey, Ph.D.
Group 11
1:45pm

Abstract:
Polycystic Ovarian Syndrome (PCOS) is a common illness in women of all ages. Studies suggest the symptoms and comorbidities of PCOS are often worse in the Hispanic population. We aimed to establish the differences between various PCOS phenotypes (Polycystic ovarian morphology vs menstrual differences) in our border population. We did a retrospective chart study to identify the differences between women diagnosed with PCOS with differential phenotypes in terms of their clinical, medical, and metabolic presentation. We further compared the clinical features of PCOS women with age-matched controls from NHANES.

2025 SARP SPRING SYMPOSIUM

Name: Riojas, Ruben
Classification: Y4
Project Title: Evaluating Clinical Performance in Medical School Clerkships: A Comparison of Spanish-Speaking and Non-Spanish-Speaking Students
Mentor: Dr. Cynthia Perry, Ph.D
Group 11
2:15pm

Abstract:
The growing Hispanic population in the U.S. emphasizes the need for Spanish-speaking healthcare providers. Language-concordant care improves patient satisfaction, reduces errors, and strengthens patient-provider relationships. Spanish-speaking medical students may have advantages in clerkships, especially with Spanish-speaking patients. This study examines whether Spanish-speaking medical students perform better in clerkships compared to their non-Spanish-speaking peers. A cohort of 173 medical students (Class of 2023 and 2024) was analyzed, comparing Spanish-speaking students (n=43) to non-Spanish-speaking students (n=130). Data included NBME shelf exam scores, OSCE results, and preceptor evaluations in patient care and communication skills, analyzed using independent t-tests and Mann-Whitney U tests. No significant differences were found between Spanish-speaking and non-Spanish-speaking students in NBME exam scores ($p = 0.21$), OSCE performance ($p = 0.89$), or preceptor evaluations for patient care and communication ($p > 0.05$ for all). Spanish proficiency did not significantly impact academic performance in clerkships.

2025 SARP SPRING SYMPOSIUM

Name: Rodriguez, Brian
Classification: Y4
Project Title: Efficacy, Mechanisms, and Safety of Intermittent Fasting: A Narrative Systematic Review of Human Trials
Mentor: Leah D. Whigham, PhD, FTOS
Group 11
2:45pm

Abstract:

- Intermittent fasting has gained popularity as a flexible and effective approach to weight loss, showing results comparable to traditional calorie-restricted diets. .
- However, while many individuals benefit, variability in adherence and metabolic response highlights the need for further research on its long-term sustainability and safety.

2025 SARP SPRING SYMPOSIUM

Name: Shi, Ted
Classification: Y4
Project Title: Splenic infarction in Granulomatosis with polyangiitis:
Case report and literature review
Mentor: Abhinav Vulisha
Group 11
3:15pm

Abstract:

- Granulomatosis with polyangiitis (GPA), previously Wegener's granulomatosis, usually presents as nonspecific systemic symptoms with a triad of upper and lower respiratory tract and renal involvement; splenic involvement is not usually an associated pathology seen.
- We report a case of a 67-year-old male former smoker with a past medical history of allergic rhinitis and glaucoma who presented with myalgias, bilateral ear pain, and rhinorrhea for three months in addition to abnormal findings of a diffuse splenic infarct on the CT abdomen and pelvis with IV contrast. An extensive workup was performed, and he was positive for cytoplasmic antineutrophil cytoplasmic antibodies (c-ANCA). He received a splenectomy; both splenic and nasal biopsies showed necrotizing vasculitis with granulomatous inflammation, which confirmed the diagnosis of granulomatosis with polyangiitis.
- Based on this case, we performed a literature review from 1980 to 2023 and compiled the existing medical literature concerning GPA associated with variable splenic involvements and management options.

2025 SARP SPRING SYMPOSIUM

Name: Stone, Dillon
Classification: Y4
Project Title: Effects of the COVID-19 Pandemic on Orthopaedic Sports Medicine Surgical Volume: A NSQIP Database Study from 2015 to 2022
Mentor: Rajiv Rajani, MD
Group 11
3:45pm

Abstract:
Anterior cruciate ligament reconstructions, meniscal debridement, and rotator cuff repairs are common orthopaedic sports medicine procedures, typically performed on an elective basis. As a result of the COVID-19 pandemic, many elective procedures were cancelled or delayed and the recovery of this surgical volume in the years following is not well documented. Our hypothesis was that surgical volume would rebound to near pre-pandemic levels in 2022. The purpose of this study is to quantify the change in sports medicine surgical volume both during and after the pandemic. The NSQIP database was used to collect data on six sports-medicine focused procedures from 2015 to 2022, where a baseline of 2015-2019 was compared to the 2020-2022 cohort. This analysis revealed a 25.48% decrease in overall volume from 2019 to 2020 as well a persistent 19.57% decrease in 2022 as compared to the baseline. Furthermore, operative time was increased 14.6% and inpatient procedures were increased 48.5% in 2022 as compared to pre-pandemic levels. These findings suggest a persistent decrease in elective sports medicine volume in the years following the COVID-19 pandemic while these same procedures also took longer and were more frequently performed in the inpatient setting.

2025 SARP SPRING SYMPOSIUM

Name: Thangavel, Chinthana
Classification: Y4
Project Title: Association of Phthalates with Sex Steroid Hormones in Hispanic Females
Mentor: Dr. Pallavi Dubey, Ph.D.
Group 11
4:15pm

Abstract:
Endocrine Disrupting Chemicals (EDCs) are a class of synthetic compounds that can interfere with normal functioning of the endocrine system with impacts on the reproductive system. This broad group of chemicals includes industrial chemicals, plasticizers such as phthalates and bisphenol A, cosmetics, flame retardants, and pesticides.
Among the EDCs, phthalates are found extensively in the environment and everyday consumer products. They are further categorized into high molecular weight phthalates (HMWP) and low molecular weight phthalates (LMWP), with HMWP found in building materials, medical devices, and food containers and LMWP commonly used in personal care and cosmetic products.
Prior research has suggested a link between phthalates and sex steroid hormones, with evidence suggesting exposure can affect the hypothalamic-pituitary-gonadal axis, total testosterone (TT) levels, and sex hormone binding globulin (SHBG) levels.
Given the widespread presence of phthalates in everyday consumer products and their potential adverse effects on the reproductive system, EDCs have become a significant public health concern that demands further research. Varying levels of phthalates are detectable in most individuals, yet their influence on hormone profiles and reproductive health remains understudied, especially among Hispanic women. This population faces higher risks for more severe manifestations of Polycystic Ovarian Syndrome (PCOS), a condition marked by endocrine irregularities such as hyperandrogenism and menstrual dysfunction.
Investigating how environmental chemicals like phthalates may contribute to these endocrine disruptions is crucial for addressing health disparities and providing targeted prevention strategies for at-risk groups.

2025 SARP SPRING SYMPOSIUM

Name: Torelli, Ryan
Classification: Y4
Project Title: Postmortem Retrieval of Gastric Tissue Reduces Interstitial Cells of Cajal
Mentor: Dr. Irene Sarosiek, Ph.D.
Group 12
1:15pm

Abstract:
Gastroparesis is a syndrome of delayed stomach emptying in the absence of obstruction associated with symptoms of nausea, vomiting, fullness, and pain (1)
Studies of gastric tissue implicate changes in the Interstitial cells of Cajal (ICC), a neuronal cell responsible for coordinating stomach contractions (2)
Few studies compare gastric tissue from subjects with gastroparesis to those without (3) due to the challenge of obtaining tissue from unaffected subjects for whom invasive biopsy serves no medical purpose
The development of a reference standard of ICC density from subjects without gastroparesis would enhance interpretation of studies in human gastric tissue for better understanding the pathogenesis of gastroparesis

2025 SARP SPRING SYMPOSIUM

Name: Torres, Joshua
Classification: Y4
Project Title: PLASMA WATER T2 IMPROVES WITH LIFESTYLE MODIFICATION: NEW PREDICTIONS FROM LINEAR MIXED
EFFECTS MODELS
Mentor: David P. Cistola MD
Group 12
1:45pm

Abstract:
Plasma and serum water T2 are global markers of inflammation, dyslipidemia, insulin resistance, and serve as screening tools for metabolic syndrome and cardiometabolic health. A recent ancillary study of PREMIER demonstrated that plasma water T2 markers detect improvement upon implementation of lifestyle changes. T2 values for 4,578 biobanked plasma and serum samples were measured. Eight hundred and ten participants were recruited and randomized into 3 treatment arms: advice-only (Treatment 1), comprehensive lifestyle intervention (Treatment 2), and comprehensive plus DASH: dietary approaches to stop hypertension (Treatment 3). Health and fitness were measured at 0 (baseline), 6- and 18-months post-intervention. In the extant study, we developed new linear mixed effects models to assess the plasma water T2 response for biomarker validation. The models incorporate adjustments appropriate for repeated measures study design to minimize confounding and bias.

2025 SARP SPRING SYMPOSIUM

Name: Toutoungy, Michel
Classification: Y4
Project Title: Surgical Treatment of Median Arcuate Ligament Syndrome (MALS) in a Series of Patients with
Gastroparesis
Mentor: Dr. Richard McCallum
Group 12
2:15pm

Abstract:
Median Arcuate Ligament Syndrome (MALS) is a rare disorder that complicates diagnosis in patients with coexisting gastroparesis. This study retrospectively analyzed eight such patients who underwent MAL release via open, laparoscopic, or robot-assisted approaches. All experienced symptom relief, with 50% achieving complete resolution and an average improvement of 73%, though PO intolerance and diarrhea predicted poorer outcomes. Open surgery and longer follow-up correlated with greater improvement, while pyloroplasty showed a non-significant trend toward better relief. Nausea and emesis should not preclude surgical evaluation, highlighting the need for a multidisciplinary approach and further research to refine patient selection.

2025 SARP SPRING SYMPOSIUM

Name: Villarreal, Natalie
Classification: Y4
Project Title: Assessment of Peripartum Psychiatric Education by Psychiatry Residents and Faculty at a Teaching Institution Along the US-Mexico Border
Mentor: Fernando Doval Perez, MD
Group 12
2:45pm

Abstract:
Peripartum psychiatric disorders affect approximately 20% of women and are a leading cause of maternal morbidity and mortality1. Despite the significant risks to both mother and child, formal training in managing peripartum psychiatric conditions is limited, and there are no ACGME guidelines for residency education on this topic. This study evaluates the knowledge, attitudes, and confidence of psychiatry faculty and residents at Texas Tech University Health Sciences Center El Paso in managing peripartum psychiatric care and identifies barriers to effective education and training. A survey was administered to general psychiatry residents and faculty which assessed participants' perceptions of the importance of peripartum psychiatric education, confidence in managing peripartum psychiatric conditions, and barriers to learning. A total of 30 responses were collected, including 25 residents and 5 faculty members. The majority (90%) agreed or strongly agreed that knowledge and preparedness to manage peripartum psychiatric conditions are important. However, only 30% felt their residency adequately taught these skills, and confidence levels in managing peripartum psychiatric conditions were low, with 23% and 30% feeling confident in inpatient and outpatient settings, respectively. Identified barriers included insufficient case exposure and the need for additional lectures or learning opportunities. While psychiatry residents and faculty recognize the importance of peripartum psychiatric care, gaps in training and confidence persist, driven by limited exposure and resources. Addressing these barriers through targeted quality improvement projects, enhanced educational opportunities, and national guidelines could significantly improve care for peripartum patients.

2025 SARP SPRING SYMPOSIUM

Name: Yousaf, Mohammad
Classification: Y4
Project Title: Title: Ischemic Preconditioning in the Prevention of Post-operative Arrhythmia in patients undergoing Cardiac Surgery.
Mentor: Dr. Nathan Holland
Group 12
3:15pm

Abstract:
Background: During coronary artery bypass grafting (CABG), the heart undergoes temporary ischemia and reperfusion, increasing the risk of post-operative arrhythmias (e.g., VT, Afib).
Problem: Despite surgical and pharmacologic advances, post-op arrhythmias remain a challenge, affecting recovery and discharge timelines.
Hypothesis: Ischemic Preconditioning (IPC) — brief, controlled ischemia before sustained ischemia — may protect cardiac tissue and reduce arrhythmias.
Mechanisms: IPC reduces oxidative stress, modifies ion channel function, and affects inflammatory pathways — all implicated in arrhythmogenesis.
Objective: Conduct a systematic review to assess IPC's effectiveness in reducing post-operative arrhythmias in cardiac surgery patients.

2025 SARP SPRING SYMPOSIUM

Name: Wood, Matthew
Classification: Y2
Project Title: Auto-Diagnostic Drosophila Inhibition Evaluator
Mentor: Kyung-Ah Han, University of Texas at El Paso
Group 12
3:45pm

Abstract:
Drosophila flies serve as a valuable model for neuroscience research due to their short lifespan and genetic manipulability. This project aimed to develop an automated benchtop testing platform, the Auto-Diagnostic Drosophila Inhibition Evaluator, to standardize behavioral experiments, particularly the Go/No-Go inhibitory control test. The system was designed to improve reproducibility, reduce human error, and allow researchers to automate inhibition-based assays. To enhance its functionality, an optogenetic feature was incorporated, enabling precise manipulation of neural activity through light stimulation. The device integrates a mass flow controller for airflow regulation, an RGB LED system for optogenetic activation, and a user-friendly touchscreen interface for experimental control.
Initial testing focused on optimizing airflow conditions, with flow rates ranging from 5 to 10 L/min. It was observed that rates above 8 L/min displaced flies from the chamber, while lower rates below 5.5 L/min failed to elicit a proper response. The optimal retention and behavioral response were achieved at 7 L/min, validating the system's suitability for conducting automated inhibitory control experiments. Despite the successful validation of the platform, further development was halted due to funding limitations required for additional hardware components. Future work aims to expand the system's capabilities by incorporating multi-chamber testing and real-time behavioral tracking to enhance its applicability in aging, neurodegenerative disease, and pharmacogenetic research.

2025 SARP SPRING SYMPOSIUM

Name: Koufteros, Christiana
Classification: Y4
Project Title: Investigations of Novel Teaching of GI Autonomics
Mentor: Heather Balsiger
Group 12
4:15pm

Abstract:
The integration of online learning into medical education has accelerated, yet its effectiveness remains debated. While some existing publicly available e-learning modules cover general autonomics, few specifically target gastrointestinal (GI) autonomics. This study evaluates an online module designed to enhance first-year medical students' understanding of GI autonomics. This study examines whether an online GI autonomics module improves student learning and confidence, compared to traditional teaching methods. A 41-slide, voice-annotated module incorporating clinical vignettes was developed. First-year medical students (n=135) completed pre- and post-module quizzes assessing knowledge retention, alongside a Likert questionnaire measuring student perceptions. Statistical analyses, including paired t-tests and Wilcoxon signed rank tests, evaluated learning outcomes. Post-module quiz scores significantly improved (6.48 to 8.04, $p < 0.05$), confirming knowledge gains. Nearly 75% of students found the module beneficial, though 25% expressed lingering uncertainty in applying concepts. Students also generally preferred online modules as an adjunct, rather than a replacement, for in-person learning. Despite these uncertainties, overall, the module demonstrated effectiveness in improving GI autonomics comprehension. Future research should explore blended learning models incorporating interactive, social-learning components to optimize medical education.

2025 SARP SPRING SYMPOSIUM

Name: Twyman, Jackson
Classification: Y3
Project Title: Mental and behavioral health crises in the PICU: A multi-institutional case series and integrative literature review (Dysregulated People in a Dysregulated Environment)
Mentor: Dr. Avi Kopstick, MD
Group 12
4:45pm

Abstract:
Background: As rates of psychiatric disorders increase and safety nets unravel, pediatric intensive care units (PICU) face many more admissions complicated by mental and behavioral health crises (MBHC). Managing these patients in high acuity medical environments is challenging for providers who often have limited psychiatric training. This multi-institutional case series and integrative literature review aims to construct initial frameworks around PICU MBHC and help develop potential solutions for improved care.
Methods: English language articles pertaining to “pediatric psychiatric boarding” were identified in MEDLINE. Quantitative and qualitative articles, reviews, and commentaries were considered. Articles were divided into six communities of practice (CoP): emergency medicine, pediatric hospitalist medicine, inpatient psychiatry, critical care medicine, community and public health, and participant viewpoints. The most evocative articles from each were selected. Data were analyzed and synthesized into emergent themes.
Results: Of 397 sampled articles, 96 were included for in-depth review. Four overarching themes emerged: i) PICU teams require a common vocabulary to effectively communicate about MBHC with specialists and each other; ii) PICU MBHC lead to the collision of dysregulated people, within dysregulating environments; iii) major gaps in evidence-based recommendations for MBHC exist; and iv) potential solutions may be combined into diverse PICU MBHC toolkits.
Conclusions: PICU MBHC present a unique challenge. Solutions for personalized and compassionate care in the PICU exist and demand further exploration.

2025 SARP SPRING SYMPOSIUM

Name: Elchouemi, Mohanad
Classification: Y2
Project Title: Risk factors for red blood cell transfusion in patients undergoing hysterectomy for stage I endometrial cancer
Mentor: Dr. Abdelrahman Yousif
Group 13
1:15pm

Abstract:
Endometrial cancer (EC) is the most common cancer among women1. Blood transfusion is a risk factor for perioperative morbidity among gynecologic oncology patients. There is a need to better understand and predict blood transfusion outcome in patients undergoing surgery for endometrial cancer (stage I).

2025 SARP SPRING SYMPOSIUM

Name: Mckee, Jack
Classification: Y2
Project Title: Dehydrosalanol (2'-3 DHS) Inhibits Pancreatic Cancer Through a DNA Damage Response Signaling Pathway
Mentor: Dr. Ramadevi Subramani Reddy
Group 13
1:45pm

Abstract:
Pancreatic ductal adenocarcinoma is a lethal malignancy with an exceptionally poor prognosis, attributable to late diagnosis and chemoresistance often linked to dysregulated DNA damage response. The lack of effective treatments underscores the need for novel therapies targeting these resistance mechanisms. This study investigated the efficacy of the small molecule Dehydrosalanol (2'-3 DHS) in suppressing pancreatic cancer growth by modulating DNA damage response. To evaluate this, human pancreatic cancer cell lines and a mouse xenograft model were treated with Dehydrosalanol, and effects on tumor cell growth, apoptosis, metastatic potential, reactive oxygen species generation, and DNA damage response signaling were assessed. Dehydrosalanol treatment significantly inhibited pancreatic cancer cell proliferation in culture and reduced tumor growth in a mouse xenograft model. Mechanistic analysis indicated that Dehydrosalanol induced DNA damage stress, evidenced by elevated ATR and CHK1 checkpoint kinase levels, along with an accumulation of reactive oxygen species. These changes were associated with activation of intrinsic apoptotic pathways, shown by upregulation of pro-apoptotic proteins (Bax and cytochrome c) and downregulation of anti-apoptotic BCL-2, resulting in increased cancer cell death. Dehydrosalanol also downregulated cell cycle regulators Cyclin D1 and CDK4, causing G1 phase cell cycle arrest. Furthermore, it reversed the epithelial-mesenchymal transition, as indicated by increased E-cadherin and decreased N-cadherin, consistent with reduced metastatic potential. Collectively, these results demonstrate that Dehydrosalanol exerts multi-faceted anti-tumor effects in pancreatic cancer by inducing DNA damage responses and oxidative stress, thereby promoting apoptosis and inhibiting both tumor growth and metastasis.

2025 SARP SPRING SYMPOSIUM

Name: Sohail, Nehaa
Classification: Y2
Project Title: Surgical Treatment of Squamoid Eccrine Ductal Carcinoma: A Systematic Review
Mentor: Mojahed Mohammad K Shalabi, MD
Group 13
2:15pm

Abstract:
Squamoid eccrine ductal carcinoma (SEDC) is a rare cutaneous eccrine malignancy that demonstrates a superficial portion similar to squamous cell carcinoma (SCC) and a deeper component of eccrine ductal differentiation on histopathology. SEDC can be misdiagnosed due to variable presentation, heterogenous classification, and unfamiliarity with the condition.
In 1997, Wong reported the first three cases of SEDC, describing it as a rare cutaneous malignancy with biphasic histological features and biological behavior.1 SEDC commonly appears in the head, neck, and extremities, and often presents in middle-aged and elderly patients as a hard, non-ulcerated cutaneous nodule or plaque.2 SEDC may also present as an exophytic lesion and can be locally destructive. Sunlight exposure and immunosuppression are risk factors noted in the literature.3 SEDC is typically diagnosed through complete excision with deeper tissue sampling. Confirmation of SEDC diagnosis can be aided by the use of immunohistochemistry, such as carcinoembryonic antigen, epithelial membrane antigen, cytokeratin 5/6, and p63.4
There is limited information published about SEDC with the rarity of the tumor. All cases to date in the literature have been treated with Mohs micrographic surgery (MMS), surgical excision, and/or amputation. SEDC is often misdiagnosed as SCC, particularly with superficial sampling in a biopsy specimen. Correct diagnosis and surgical intervention are essential, as risks of recurrence and metastasis are higher in this tumor compared to those in SCC. This systematic review presents the cases in the literature of SEDC treated with different surgical modalities and analyzes their rates of recurrence and metastasis.

2025 SARP SPRING SYMPOSIUM

Name: Ahmed, Faiza
Classification: Y4
Project Title: Effectiveness of Interactive Dermatology Topical Treatment Modules in Medical Education
Mentor: Dr. Rebecca Campos M.D
Group 13
2:45pm

Abstract:
Dermatology education remains limited in U.S. medical school curricula, with students receiving less than 10 hours of instruction on average. Given dermatology's inherently visual nature and the need for practical knowledge on common treatments, innovative teaching methods are essential. This project evaluated the Effectiveness of Interactive Dermatology Topical Treatment Modules in Medical Education at the Paul L. Foster School of Medicine.
First-year medical students completed an interactive, web-based module on topical dermatology treatments, featuring clinical images across a range of skin tones, case-based questions, and opportunities for self-assessment. Pre- and post-module quizzes were used to assess knowledge improvement, and an anonymous survey gathered feedback on engagement, usefulness, and interest in dermatology.
The aggregate quiz score improved from 63% pre-module to 86% post-module. Students rated the module as useful and appropriately interactive, though suggestions included adding more cases and streamlining content.
Despite a small sample size (n=8), findings suggest that interactive, case-based E-learning can enhance dermatology education by improving knowledge and engagement. Future directions include expanding the module to more learners, including residents, and refining its structure based on feedback. Longitudinal studies may also help evaluate retention and long-term impact on clinical practice.

Name: Akahara, Ozioma
Classification: Y4
Project Title: The Association of Diet and Acne and the Self-Reported Impact of Acne on Self-Perception Among Adult Medical Students
Mentor: Dr. Rebecca Campos M.D
Group 13
3:15pm

Abstract:
This study examines the impact of acne on self-perception among first- and second-year medical students, a population often exposed to high levels of stress. Previous research has demonstrated the influence of external factors, such as physical appearance, on self-worth, self-esteem, and self-confidence. Given the pressures faced by medical students, this study investigates the effects of acne severity on mood, confidence, and social and professional life. A cross-sectional survey was conducted among 25 medical students to assess acne severity and its impact on various aspects of self-perception. The results showed significant associations between acne severity and gender, self-esteem, social life, avoidance of social interactions, confidence in social situations, and perceived impact on education (p-values: 0.04, 0.014, 0.024, <0.001, 0.033, and 0.032, respectively). The relationship between acne and professional confidence was marginally significant ($p = 0.064$). In conclusion, acne appears to negatively affect self-perception, particularly in relation to self-esteem and professional confidence. Due to the limited sample size, further studies with larger populations are warranted. We recommend a multidisciplinary approach to acne management.

2025 SARP SPRING SYMPOSIUM

Name: Akinlusi, Idris
Classification: Y4
Project Title: MICROGLIAL POLARIZATION IN RESPONSE TO BORRELIA BURGDORFERI INFECTION
Mentor: Dr. Jorge Cervantes, M.D., Ph.D.
Group 13
3:45pm

Abstract:
Lyme disease can lead to neuroborreliosis when Borrelia burgdorferi spreads to the central nervous system, where microglia play a key role in the immune response. This study examines microglial polarization following infection using the HMC3 human microglia cell line using flow cytometry. Flow cytometry at 4 and 24 hours showed a decrease in the M1 marker iNOS and the M2 marker CX3CR1, with no changes in other polarization markers. These findings suggest that early microglial responses to B. burgdorferi do not fully align with classic M1/M2 polarization, highlighting the need for further research into inflammatory mediators as potential therapeutic targets in neuroborreliosis.

2025 SARP SPRING SYMPOSIUM

Name: Alvarado, Alejandra
Classification: Y4
Project Title: Bacille Calmette Guerin modulates human macrophage response to SARS CoV 2-S glycoprotein
Mentor: Dr. Jorge Cervantes, MD
Group 13
4:15pm

Abstract:

The SARS-CoV-2 virus, responsible for the COVID-19 pandemic, is a highly contagious pathogen that emerged in 2019. Originally, the Bacille Calmette-Guerin (BCG) vaccine was primarily used in developing nations to prevent non-pulmonary tuberculosis. However, recent epidemiological data suggest BCG might offer some protective effect against COVID-19. The study aimed to investigate whether BCG pre-exposure in human monocyte-derived macrophages could influence their immune response to the SARS-CoV-2 spike protein.

Using Dual THP-1 cells with NF-κB and IRF reporter plasmids, these cells were differentiated into macrophages over three days with PMA, followed by maturation with recombinant tumor necrosis factor-α. After 24 hours of BCG exposure, cells were stimulated with the SARS-CoV-2 S-glycoprotein for an additional 24 hours. NF-κB and IRF activation levels were then assessed through colorimetric and luminescence assays for SEAP and luciferase, respectively.

The pre-exposure of human macrophages to BCG led to enhanced activation of IRF and NF-κB in response to the SARS-CoV-2 S-glycoprotein. Eluding to the idea, that BCG's effects extend beyond its typical scope, providing broader immune support against other respiratory diseases. The progression of severe COVID-19 is often associated with inflammation, marked by elevated pro-inflammatory cytokine production and delayed Type I interferon responses. The results suggest that BCG might elevate Type I IFN levels, a protective factor against severe COVID-19, potentially shaping the development of future therapies for viral infections.

2025 SARP SPRING SYMPOSIUM

Name: Price, Estella
Classification: Y4
Project Title: Implicit Bias in Medical School Admissions: An Observational Study
Mentor: Kristina Sinnott
Group 13
4:45pm

Abstract:
Problem: Implicit racial preference has been linked to discrimination across various levels of education, criminal justice, and healthcare. This has the potential to impact training, employment, and retention of African Americans in the medical field, contributing to ongoing underrepresentation, isolation, and alienation, along with other minority groups. Methods: To address this gap, we deployed a single-blinded observational study using the Implicit Association Test and a self reported demographics survey to determine if there was widespread implicit bias in our admissions committee for the 2021-2022 cycle. The results of the IAT were analyzed using the Cohen d-score associated with a preference between two groups, in this case Black or White Americans. Results: There were a total of (41) members of the admissions committee made up of students (15), faculty (20), and community physicians (6). The d-scores were then analyzed by the reported demographics: basic job, title, gender, race, # of IAT trainings and explicit racial preference. Overall, average Cohen d-score d=0.375 (P=2.11e-7) indicating significant Moderate implicit European Preference over African Americans. Discussion: Implicit racial bias has the potential to impact medical education and training, influencing education, clinical grades, residency match cycles, patient outcomes and attrition rates.1,2,3 Furthermore, there is limited knowledge about the presence of implicit racial bias within medical school admissions committees or other levels of medical education and training.4 Identifying and addressing implicit biases at this level can be a significant step toward creating a more equitable and inclusive medical education system, ultimately improving diversity within our profession.

2025 SARP SPRING SYMPOSIUM

Name: Aloman, Catalina
Classification: Y4
Project Title: The Use of Synthetic Bone Grafts in Orthopedic Surgery: A Systematic Review
Mentor: Dr. Rajiv Rajani
Group 14
1:15pm

Abstract:
Introduction: The current standard of care for treatment of non-union fractures includes autologous grafts (AG) from the iliac crest which have the ideal trifecta properties of osteoconduction, osteoinduction, and osteogenesis; however, have increased complications.
Methods: A MESH term Boolean search of (Beta-Tricalcium Phosphate OR Synthetic Bone Graft) AND (Fracture OR Cavitary OR Non-Union) NOT (Spinal Fusion) was conducted in PubMed yielding a large selection of articles focused on synthetic bone graft applications in orthopedics. Articles were filtered in PubMed and read through individually for inclusion based on pre-set exclusion and inclusion criteria. These articles were then analyzed by 2 reviewers for qualitative and quantitative data pertaining to SBG and/or AG use in human trials.
Results: While unable to conduct statistical analysis of the reported data, subjective analysis suggests no significant difference in radiological or clinical outcomes between SBG's and AG's. Both have similar rates of union and effectively treat the fracture in all studies analyzed. Only 4 studies directly compared SBG's to AG's and reported SBG superiority in blood loss, articular subsidence, and elimination of post-operative pain from an AG donor site.
Conclusion: The field of synthetic bone grafts has shown great promise and innovation in the last two decades. With a short-term emphasis on non-inferiority of SBG's versus AG's, patients can benefit from a decreased need for additional procedures to obtain autogenous material. Moving forward, outcomes require standardized reporting across studies to better analyze the ideal combination of materials that will subsequently create a new standard of care for the treatment of fractures and non-unions.

2025 SARP SPRING SYMPOSIUM

Name: Gatan, Michaela
Classification: Y4
Project Title: Transcranial magnetic stimulation and its effects on treatment-resistant depression and comorbid anxiety symptoms
Mentor: Dr. Guadalupe Vidal, Ph.D., Southwest Brain Bank, Senior Research Scientist
Group 14
1:45pm

Abstract:
Major depressive disorder (MDD) is a significant psychiatric disorder that manifests as significant negative changes in mood and affects daily aspects of living. MDD affects approximately 14.5 million in the United States, or 8.3% of the United States population.1 While numbers vary among studies, a study combining four different population studies in the U.S. found that 30.9% of those with medication-treated MDD have treatment-resistant depressionthis represents 2.8% of the U.S. population.2 Although there are some variations in definition, treatment-resistant depression (TRD) is typically regarded as major depressive disorder (MDD) which does not respond adequately after two trials of anti-depressants.3 TRD is associated with increased rates of sleep disorders, comorbid psychiatric disorders such as anxiety and substance use disorder, intentional self-harm, and a higher rate of all-cause mortality.4 Among these comorbidities, of high importance is anxiety disorder, which accounts as a comorbid disorder for approximately 50% of those with MDD and as high as 81% for those with TRD.5 There are a variety of options available for treatment-resistant depression such as medication, psychotherapy, electroconvulsive therapy, and repetitive transcranial magnetic stimulation (rTMS).6-10Among these, rTMS is a non-invasive and well-tolerated treatment, rendering it a promising alternative for patients who have not responded to other therapies.11-12 Theoretically, rTMS works by applying various electrical frequencies (i.e., at 1, 5 or 10Hz) with differing patterns (i.e., theta burst – otherwise known as theta burst stimulation or TBS- and quadrapulse) to certain brain regions to alter synaptic plasticity. At 1Hz, rTMS works to produce inhibitory patterns (termed long-term depression) while at higher frequencies- i.e., 5 and 10Hz- rTMS works to produce excitatory patterns (termed long-term potentiation).13 In adults with MDD, protocol for rTMS opt for 10Hz frequencies to be delivered at the left dorsolateral prefrontal cortex (DLPFC) which is known to be hypoactive in patients with negative emotional judgment.14 TMS in GAD, however, has been studied under varying frequencies delivered at mainly the right DLPFC with some studies delivering rTMS at the left DLPFC.15 TMS has been widely studied and recently approved for TRD. However, its effects on patients with comorbid disorders such as anxiety disorders are still under-studied.

2025 SARP SPRING SYMPOSIUM

Name: Hawwar, Majd
Classification: Y4
Project Title: REPORT: "CMPN/CMP SIGNALING NETWORKS IN THE MAINTENANCE OF THE BLOOD VESSEL BARRIER"
Mentor: Dr. Jun Zhang, PhD. Previously at TTUHSC El Paso
Group 14
2:15pm

Abstract:
Disruptions in blood-brain barrier (BBB) integrity contribute to neurovascular conditions such as hemorrhagic stroke, yet the molecular mechanisms underlying these disruptions remain poorly understood. Emerging research highlights the crucial role of sex steroids, particularly progesterone (PRG), in maintaining BBB stability through endothelial cell (EC) repair and neovascularization. In this review, we examine steroid signaling pathways that regulate BBB integrity, with a special focus on the interaction between PRG and the cerebral cavernous malformations signaling complex (CSC) within the CmPn/CmP signaling network. We explore how perturbations in CmPn/CmP signaling, particularly within cerebral ECs, compromise endothelial junctions and lead to BBB dysfunction. Additionally, we discuss the broader role of other steroids in BBB maintenance and their potential therapeutic implications for treating hemorrhagic stroke. Understanding these mechanisms will provide critical insights into novel therapeutic strategies for neurovascular injury and BBB-related pathologies.

Name: Heh, Ethan
Classification: Y4
Project Title: Assessing the impact of lipid modifying enzyme expression in acute myeloid leukemia (AML) and other forms of cancer
Mentor: Dr. Anna Eiring, Ph.D., The University of Texas at El Paso
Group 14
2:45pm

Abstract:
Disruptions in blood-brain barrier (BBB) integrity contribute to neurovascular conditions such as hemorrhagic stroke, yet the molecular mechanisms underlying these disruptions remain poorly understood. Emerging research highlights the crucial role of sex steroids, particularly progesterone (PRG), in maintaining BBB stability through endothelial cell (EC) repair and neovascularization. In this review, we examine steroid signaling pathways that regulate BBB integrity, with a special focus on the interaction between PRG and the cerebral cavernous malformations signaling complex (CSC) within the CmPn/CmP signaling network. We explore how perturbations in CmPn/CmP signaling, particularly within cerebral ECs, compromise endothelial junctions and lead to BBB dysfunction. Additionally, we discuss the broader role of other steroids in BBB maintenance and their potential therapeutic implications for treating hemorrhagic stroke. Understanding these mechanisms will provide critical insights into novel therapeutic strategies for neurovascular injury and BBB-related pathologies.

2025 SARP SPRING SYMPOSIUM

Name: Khan, Ameen
Classification: Y4
Project Title: Impact of COVID on Medical Field of Choice in Medical Students Near the USMexico Border
Mentor: Dr. Rebecca Campos, MD
Group 14
3:15pm

Abstract:
Purpose:
Factors that gravitate medical students toward their desired field of study are important to explore, especially in areas that face physician shortages such as the US-Mexico border. This study investigated such factors for medical students near the US-Mexico border and the effects that COVID-19 had on their selection.
Methods:
The study population consisted of current medical students (class of 2025-2029) attending Paul Foster School of Medicine. An electronic Qualtrics survey was used to collect anonymous data including demographics, impact of COVID, and future career interests.
Results:
Most participants claimed the COVID-19 pandemic impacted them personally and professionally. However, of these students, most felt the pandemic had not affected their desire or attitude towards pursuing a career in medicine or their medical school experience. Students with more debt and those more concerned about workload/work flexibility were more likely to choose pediatrics. Students who thought the pandemic affected their experience while in medical school were less likely to choose internal medicine. Students who thought the pandemic changed the factors they prioritize when choosing a field of medicine and those less concerned about a flexible lifestyle were more likely to choose surgery. Students with more years of professional work experience were less likely to choose emergency medicine. Students more concerned about personal or professional support were more likely to choose psychiatry.
Conclusion:
The COVID-19 pandemic did not impact medical students' attitude or field of choice near the US-Mexico border. Further research should be conducted to include a broader population to understand the effects of the pandemic, whether factors are weighed differently in certain regions of the nation, and how these priorities might change throughout training.

2025 SARP SPRING SYMPOSIUM

Name: Anjum, Mahnoor
Classification: Y2
Project Title: Evaluating the Impact and Effectiveness of the Tuesday Afternoon Club: A Study of Medical Student Participation and Outcomes
Mentor: Dr. Jessica Chacon, Ph.D.
Group 14
3:45pm

Abstract:
There have been many new insights and innovations aimed at improving resources for medical student wellbeing. Some of these avenues have historically included factors related to faculty and staff. Another recent one described in the existing literature is the practice of peer teaching.
The purpose of this study is to explore how a combination of peer teaching and faculty presence can intersect to benefit students, specifically in the field of medical education.
Tuesday Afternoon Club (TAC) is a weekly, open forum where students interact with both peer tutors and faculty at the Paul L. Foster School of Medicine. Students who attended these sessions were anonymously surveyed about their experiences.
72% students felt more confident approaching peer tutors after attending TAC sessions (figure 1) and 57% students also felt TAC improved their connections with professors (figure 2). 65% students felt that attending TAC helped them better understand a topic (figure 3). While 21% students mentioned that they preferred the existing open-forum structure, 29% preferred having a set agenda, 21% strongly preferred having a set agenda, and 21% had no preference (figure 4).
The data suggests that having an open, collaborative setting in which students can seek academic support is a useful avenue for medical students to reach out and develop meaningful connections with peer tutors and various faculty members. It is very promising that the majority of students felt that attending TAC was beneficial for them to better understand a topic. In regards to potential future improvements to TAC, student opinions vary and are quite divided. Overall, this pilot study provides an interesting insight into the effectiveness of the intersection between peer teaching and faculty presence in the sphere of medical student education and wellness.

2025 SARP SPRING SYMPOSIUM

Name: Phan, Angel
Classification: Y4
Project Title: Chronic Lymphocytic Inflammation with Pontine Perivascular Enhancement Responsive to Steroids (CLIPPERS) Clinical Manifestations in Children vs Adults
Mentor: Dr Gilbert Handal, M.D.
Group 14
4:15pm

Abstract:
Chronic lymphocytic inflammation with pontine perivascular enhancement responsive to steroids (CLIPPERS) is a syndrome that mostly affects the central nervous system and has predominantly been presented and described in adults. The aim of this study is to compare the manifestations, radiological findings, associated diseases, treatment, and outcomes in pediatric to adults cases. A worldwide review of case reports found 17 pediatric cases that were then compared with the 23 adult cases described in a previous study. The results demonstrated that though the majority of symptoms are similar between the two populations, pediatric cases are less likely to present with facial sensory changes (P=<0.01) and cognitive impairment (P=0.03). Radiological enhancement also similarly presented in the medulla for adults and children, but pediatric cases included the cerebral hemispheres, whereas adult cases included the midbrain and subcortical white matter involvement. Treatment response and outcomes were also similar, but adult cases had a larger variety of associated pathologies. In order to optimize treatment and follow up, future approaches in children should mirror that of adults while accounting for frequent recurrences, and the likely presence of a primary disease such as EBV B cell lymphoma or hemophagocytic lymphohistiocytosis.

Name: Rodriguez, Yuridia
Classification: Y4
Project Title: Immunomodulatory Effect of Oral Microbiota on Alveolar Macrophage Response to the SARSCoV-2 S Protein
Mentor: Dr. Jorge Cervantes, Nova Southeastern University
Group 14
4:45pm

Abstract:
It was previously thought that the lung was a completely sterile environment. However, studies have shown that the lungs are inhabited by different species of microorganisms specifically at the alveoli (Bassis et al., 2015). The alveoli are the structures in the lungs where gas exchange takes place. In addition, the reason why the lung was thought to be a sterile environment was because of the presence of alveolar macrophages whose sole job is to clear the lungs of any microorganisms. However, recent studies have shown that these alveolar macrophages have formed a symbiotic relationship with the microorganisms that have now been found to normally inhabit the lungs thereby allowing them to coexist in the same environment (Bao et al., 2020). These microorganisms that form a symbiotic relationship with their host are called microbiota. Furthermore, it was also found that the microbiota inhabiting the oral cavity were almost identical to the microbiota that inhabit the lungs (Bassis et al., 2015). This is due to bacteria being able to travel from the oral cavity down to the lungs via the respiratory tract through micro-aspirations.
The recent COVID-19 pandemic was caused by a respiratory virus named Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). Given that SARS-CoV-2 affects the lungs, it then became important to find out whether there is an association between SARS-CoV-2 during its course of infection and the lung microbiota since they occupy the same environment. Recent studies have pointed out that there is an association between the two (Bao et al., 2020). Other studies have even specifically pointed out that decreased amounts of specific genus of bacteria like Collinsella spp. have been associated with higher COVID-19 mortality rates (Hirayama et al., 2021). Therefore, now more than ever it has become increasingly important to closely study the association between the lung and oral microbiota and SARS-CoV-2.
With all this being said, this study will focus specifically on the association between the oral microbiota and the infection process brought forth by SARS-CoV-2. We will specifically focus on exposing alveolar macrophages to members of the oral microbiota, in order to mimic the lung environment, and then exposing these alveolar macrophages to the SARS-CoV-2 S protein, in order to mimic a SARS-CoV-2 infection. The SARS-CoV-2 S protein is found on the surface of the virus and is a major antigenic stimulus in the severe inflammatory manifestations observed in COVID-19.
The main goal is to evaluate how the presence of members of the oral microbiota affects the inflammatory process triggered by SARS-CoV-2's S protein. This would be valuable information to know because if we find that the oral microbiota actually decrease inflammation when the alveolar macrophages are exposed to them, then this would mean that we found a way to decrease the inflammation process of SARS-CoV-2. The effects mediated by SARS-CoV-2 that go on to cause COVID-19 occur because of the inflammatory response elicited by the virus. When the virus comes in contact with the alveolar macrophages, the macrophages elicit an inflammatory response known as a cytokine storm. This allows them to recruit more inflammatory mediators in order to fight off the infection. However, this comes at the cost of causing damage to the lungs. This damage to the lungs is what causes the respiratory symptoms

that are characteristic of COVID-19. In the future, a combination of bacteria that have been proven to decrease the inflammatory response to SARS-CoV-2 could be used prophylactically for not only SARS-CoV-2 but for other organisms capable of causing respiratory illnesses.