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ABSTRACT SUPPLEMENT

# Abstracts*

## ORAL PRESENTATIONS

### 001

### Exploración de la relación que tiene el uso de videojuegos con la ansiedad generalizada en estudiantes universitarios.

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Trasfondo y Objetivos: En la actualidad, se ha observado un crecimiento en los niveles de ansiedad entre los estudiantes universitarios, y muchos recurren a diversas formas de tecnología para hacer frente a estas emociones negativas. Uno de los enfoques que ha ganado atención es el uso de videojuegos como estrategia de afrontamiento. A pesar de la existencia del modelo compensatorio, que sugiere que los videojuegos pueden ser eficaces para gestionar sentimientos negativos, la literatura carece de evidencia sólida sobre la utilización de esta tecnología para el manejo de la ansiedad, especialmente en poblaciones hispanas. El propósito de este análisis secundario es examinar si existe una correlación significativa entre el uso de videojuegos y la presencia de ansiedad generalizada en estudiantes universitarios. Método: El estudio empleó un muestreo por conveniencia para seleccionar una muestra de 104 estudiantes universitarios. La participación de los estudiantes consistió en completar un formulario en línea que recopiló datos sociodemográficos, niveles de ansiedad según la Escala del Trastorno de Ansiedad Generalizada (GAD-7) y la frecuencia de uso de videojuegos. Resultados: Los resultados de la correlación de Spearman revelaron una asociación negativa entre el uso de videojuegos y la ansiedad generalizada (p = 0.029, rho = -0,22, IC del 95,00% = [-0,39, -02]). El análisis por género reveló una correlación negativa entre la ansiedad y el uso de videojuegos en participantes masculinos (rho= -.28, p = .045, 95.00% CI = [-.51, -.01]), pero no en participantes femeninas (rho= .17, p = .023, 95.00% CI = [-.11, .43]). Conclusión: Los resultados indican que a medida que aumenta el uso de videojuegos, disminuyen los síntomas de ansiedad generalizada. Sin embargo, esta asociación parece ser más destacada en participantes masculinos, sugiriendo posibles diferencias de género en la relación entre el uso de videojuegos y la ansiedad en estudiantes universitarios. Reconocimientos: Ninguno.

### 002

### Engagement in Activities to Manage Undesirable Stress/Emotions and Symptoms of Anxiety, Depression, and Fear of Infection During the COVID-19 Pandemic

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Background/Objective: Many adults experienced elevated symptoms of anxiety (SA), depression (SD) or fear of COVID-19 infection (FOCI) during the pandemic. Facing considerable life disruption, most people engaged in activities to manage undesirable stress and emotions (AMUSE) to cope with their burden. We examined potential differences in SA, SD, and FOCI among adults with different levels of engagement in AMUSE during the COVID-19 outbreak. Methods: Participants aged 21–79 years (N=1733) enrolled in an online survey (IRB-approved). They had to be Puerto Rico residents for ≥3 months before enrollment, have internet access, and understand Spanish. Adults completed the Patient-Health Quesionnaire-4 and the FOCI-Questionnaire, which measures obsessive/agoraphobic (OAF) and personal contact fears (PCF). We defined groups based on their engagement in AMUSE in a typical week during the pandemic: zero (G1), 1–2 (G2), 3–4 (G3), or ≥5 (G4) activities. We used Chi-square tests to examine rates of clinical levels of symptoms among groups.

Using ANCOVAs, adjusted for sociodemographic variables, we examined group differences in symptom severity. Results: Adults in G4 showed lower severity of SA than adults in other groups. We observed a similar pattern in anxiety rates, although differences between G1 and G4 were not statistically significant. Adults in the first three groups obtained higher SD scores than members of G4, while only G1 presented more severe depression than G3. Depression rates were similar in G1 and G2 but higher than in G3 and G4. The latter had lower rates and severity of FOCI-OAF than the remaining groups. All groups were similar in their mean severity of PCF, although rates of elevated PCF were higher in G1 compared with G3 and G4. Conclusion: Promoting engagement in multiple AMUSE might help in keeping lower levels of SA, SD and fear of infection among adults living in Puerto Rico during pandemics. Acknowledgements: This study was financed with the personal funds of the researchers.

## 003

### Hispanic Caregivers' Challenges and Barriers When Facing Type 1 Diabetes in their Adolescent Offspring

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Background/Objective: Caring for adolescents with type 1 diabetes (T1D) is associated with significant challenges and barriers. However, these challenges/difficulties have not been explored in depth among Hispanics caregivers. We examined the specific content of caregivers' challenges and barriers when facing T1D in their offspring and the relationship between reports of multiple barriers and health-related outcomes. Methods: Participants were 65 Hispanic caregivers (81.54% women) aged 32–58 ($M$=43.34) who completed eligibility assessments for an adolescent depression treatment study. Caregivers answered an open-ended question regarding their main difficulties with T1D in their children (aged 12-17 years). We identified the main themes of parental challenges and coded responses using categories based on their content. We used Chi-square tests, Student t-tests, and Pearson correlation to assess the relationship between reports of multiple barriers and health-related outcomes ($p \leq .05$). Approved by IRB: 1112-005. Date: 1/28/2020. Results: Caregivers' responses produced 89 codable units. Agreement between two coders was excellent ($\kappa$=.97). Categories of challenges/difficulties and their occurrence were: "Social or Structural Barriers" (22.47%), "Cognitive/Affective Aspects in the Family" (30.37%), "Short-Term Complications/Emergency Situations" (15.73%), "Difficulties Related to Follow-up and Relative Responsibility" (8.99%), "Difficulties in Treatment Adherence" (14.61%), "Developmental Stage/Hormonal Aspects" (4.49%), and "No Difficulties" (3.37%). The proportion of caregivers with responses coded within these categories was 27.69%, 36.92%, 18.46%, 12.31%, 20.00%, 6.15%, and 4.62%, respectively. Caregivers whose responses contained ≥2 different codes showed more frequent T1D-related worries and had children who checked their glucose levels less frequently and presented higher rates of depressive disorders. Multi-coded responses were also associated with a lower frequency of behaviors to prevent hypoglycemia. Conclusion: Our findings suggest that the most frequent parental challenges/barriers to managing T1D in youth relate to psychological aspects of family members and socio-structural barriers to diabetes management. Reports of multiple categories of challenges are indicative of higher rates for depression and less adherence to T1D self-care. Acknowledgements: This study was supported by the National Institute of Diabetes and Digestive and Kidney Diseases (R03DK092547). Work on this study was also possible thanks to Institutional Funds for Research granted to the last two authors by the Deanship of Graduate Studies and Research of the University of Puerto Rico, Río Piedras Campus.

004

## Engagement in Pleasant Activities Relates to Reduced Loneliness, Posttraumatic Stress, and Death/Self-Harm Thoughts During the COVID-19 Pandemic

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Background/Objective: Many adults experienced feelings of loneliness (FOL), posttraumatic stress disorder (PTSD) symptoms, or death/self-harm thoughts (DSHT) during the COVID-19 pandemic. Facing considerable life disruption, most people engaged in activities to manage undesirable stress and emotions (AMUSE). We examined potential differences in FOL, PTSD symptoms, and DSHT among adults with different AMUSE engagement levels during the outbreak. Methods: Participants aged 21–79 (*N*=1733) enrolled in an online survey (IRB-approved). They had to be Puerto Rico residents for ≥3 months before enrollment, have internet access, and understand Spanish. Adults completed the 6-item DeJong Gierveld Loneliness Scale, the Primary Care PTSD-Screen for DSM-5, and questions about DSHT during the outbreak. We defined groups based on their AMUSE engagement in a typical week during the pandemic: zero (G1), 1–2 (G2), 3–4 (G3), or ≥5 (G4) activities. With Chi-square tests, we compared rates of these problems among groups. With ANCOVAs, adjusted for sociodemographic variables, we examined group differences in problem severity. Approved by the IRB: 1920-194. Date: 6/9/2020. Results: Groups 1 through 3 showed more severe PTSD scores than G4. We observed similar results for rates of clinical PTSD but only G1 and G4 differed statistically. G1 and G2 had higher rates and severity of FOL than G3, which rates and severity were also higher than in G4. A larger proportion of G1 and G2 adults experienced DSHT anytime during the pandemic compared to participants from G3 and G4. Within two weeks before enrollment, respondents in G1 experienced higher rates of DSHT than the rest of the groups, and G2 had higher rates than G4. However, when considering the severity of DSHT within that period, only G1 differed statistically from G3 and G4. Conclusion: Promoting engagement in multiple AMUSE might help in keeping lower levels of FOL, PTSD symptoms, and DSHT among adults living in Puerto Rico during pandemics. Acknowledgements: This study was financed with the personal funds of the researchers.

005

## Experiencias de familiares de pacientes hospitalizados con diagnóstico de COVID-19 CONECTADOS con videollamadas

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Trasfondo y Objetivos: El virus del COVID provocó la cancelación de la presencia de familiares de pacientes en los hospitales. Como alternativa de comunicación y acompañamiento entre el paciente y su familia, la Escuela de Enfermería del Recinto de Ciencias Médicas, Universidad de Puerto Rico creó el Programa CONECTADOS financiado con fondos federales manejados por el Departamento de Salud de Puerto Rico. Se equiparon diecisiete hospitales con recursos para la implementación de videollamadas. El propósito del estudio fue explorar las experiencias de los familiares de pacientes hospitalizados en unidades de cuidado intensivo que participaron de CONECTADOS. Método: Se realizó un estudio cualitativo fenomenológico en el cual se entrevistaron individualmente a familiares vía telefónica utilizando una guía con preguntas semiestructuradas. Se utilizó el método de Colaizzi para el análisis. Aprobado por el IRB: 2290030455. Fecha: 7/1/2022. Resultados: Participaron cuatro familiares de un paciente sobreviviente y de tres no sobrevivientes. Surgieron seis temas emergentes con sus temas agrupados: (1) una nueva realidad- la separación (pérdida de contacto físico y emociones asociadas como soledad, impotencia, angustia y miedo), (2) percepción negativa (experiencia difícil

y sinónimo de muerte), (3) videollamadas- medio de preservar el proceso de comunicación (medio eficiente y eficaz de comunicación), (4) vínculo familiar (estímulo que producía esperanza), (5) ambivalencia emocional (sentimientos mixtos) y (6) integración familiar mediante el profesional de enfermería enlace (validar el estado clínico, enfermería como extensión de la familia y gratitud hacia CONECTADOS). Conclusión: Los participantes expresaron la complejidad de sus experiencias vividas ante la separación por el COVID. Las videollamadas fueron una alternativa para el proceso de comunicación proveyendo esperanza y emociones mixtas. El rol del profesional de enfermería fue reconocido por los familiares ya que permitieron la conexión con sus seres queridos en ese momento de crisis, la validación del estado clínico y actuaron como una extensión de la familia.

## 006

### Universal Intimate Partner Violence (IPV) screening & counseling among women living with HIV: preliminary results.

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Introduction: HIV infection may trigger or augment physical violence, particularly against women, with many events related to the diagnosis. Women living with HIV (WLHIV) reported experiencing more violence (physical, emotional, or sexual) during their lifetime than the HIV- controls in a prior study. We need to educate all WLHIV on the prevention of IPV as well as safety measures to address violent relationships. The phenomenon of increased IPV during and after the initial COVID-19 lockdowns is a general experience worldwide. Lockdowns and decreased availability of services affected the options for women victims of IPV. Methods: To address Intimate Partner Violence (IPV) Screening & Counseling in our clinic we implemented four strategies: 1) universal IPV screening, 2) clinical staff training,3) patient empowerment training, and 4) timely case management within a public health framework. The WAST Screen for IPV (8 questions) is used for screening. Preliminary experiences are presented. IRB Approved: 2290032654. Date: 11/12/2023. Results: Among more than 455 women cared at the clinic, the majority (61.4%) are older than 45 years, with stable and/or permanent housing (98.7%). The main transmission risk was heterosexual contact in 84.8% and perinatal transmission (10.3%). Most achieved viral load suppression (82.9%) and 89.9% had >200 CD4 cells/ml. Universal IPV screening started in January 2024 with 27 patients in the first month. Of those, 8 had abnormal scores which activated interventions by the clinical staff (clinician, psychologist). Up to 51 women have participated in empowerment workshops with excellent reception and participation. Conclusions: The transformation of a clinic addressing clinic staff training, universal IPV screening and counseling, patient empowerment and timely case management is ongoing. Comprehensive HIV care includes addressing issues that might affect patient safety, adherence, access to care and self-management. Preliminary data shows that experiences of violence are prevalent among 29.6% and need to be addressed. HRSA Grant NOA 6 H12HA24858-11-01. Funding: HRSA Grant NOA 6 H12HA24858-11-01

## 007

### Assessing the Impact of Vaccination on the Reemergence of Canine Rabies

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Background and Objectives: Rabies, a zoonotic disease that causes the loss of approximately 60,000 lives worldwide each year, remains endemic in portions of Latin America, Africa, and Asia. The vital role of infectious canines in spreading the disease to humans emphasizes the necessity of acknowledging and decreasing the effect it has. The objective of this research is to develop a computational code to analyze the multiple outcomes of rabies resurfacing to develop an efficient method for long-term management or eradication. Methods: We focus on Arequipa, Peru, a region characterized by a large

stray dog population (N) and endemic dog rabies. To simulate the dynamics of canine rabies during disruptions induced by natural disasters or pandemics, a determinist model with four compartments (S: susceptible, V: vaccinated, E: exposed, I: infectious) was implemented. The resulting coupled differential equations were solved and plotted using MATHEMATICA, a computer algebra system. Furthermore, a stability and sensitivity analysis were carried out. Results: Assuming one year without vaccination, we assess the impact of one-month vaccination campaigns during the next five years. We found that in the second year a greater percentage (1.4 %) of infectious dogs. In the following three years, the percentage of infectious dogs diminishes to 0.8%, 0.4 %, and 0.2%, respectively. Exposed dogs were approximately ten times as much as infectious dogs. Without any vaccination campaign, we found an increase to 3% in the infectious dogs' population. Conclusions: The possible resurgence is dependent on an increase in canine birth rates, the interval of vaccination campaigns, and the transmission coefficient. Consistent vaccination campaigns can significantly reduce the percentage of infectious and exposed dogs. The most efficient range of time for vaccine administration is two weeks annually. Acknowledgements: This research was supported by PR-LSAMP ROUSS program.

## 008

## Plasma proteins associated with COVID-19 severity in Puerto Rico

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Background & Objectives: Viral strains, age, and host factors including genetics and proteins are associated with variable immune responses against SARS-CoV-2 and disease severity. *We hypothesized that unique proteins/pathways are associated with COVID-19 disease severity in Puerto Rican Hispanics*. Methods: Following approval and consents (IRB Protocol #0720120), a total of 121 men and women aged 21-80 years-old were recruited in Puerto Rico. Plasma samples were collected from unvaccinated COVID-19 infected subjects during acute disease (n=39) and compared to COVID-19 negative individuals (n=56) during acute disease using proteomics and cytokine expression. Infected individuals were stratified based on symptomatology as follows: mild (n=18), moderate (n=13), and severe (n=8). Quantitative proteomics was performed in plasma samples using Tandem Mass Tag (TMT). Labeled peptides were subjected to Mass Spectrometry and analyzed by Proteome Discoverer, *Limma* software, and Ingenuity Pathways Analysis (IPA). Most relevant proteins associated with COVID-19 severity were interrogated by ELISA. Cytokines in plasma were quantified using a human cytokine array. Results: Proteomics analyses revealed 56 differentially regulated proteins and the top 3 pathways that were predicted to be inhibited in severe patients including LXR/RXR signaling, Production of NO and ROS in macrophages, and Synaptogenesis signaling. Decreased cadherin-13 validated by ELISA, which participates in synaptogenesis, is a novel protein is a novel protein not previously reported in other studies of COVID-19 severity and validated by ELISA. Cytokine analyses showed that TNFα levels decreased with disease severity. Conclusions: This study uncovers potential host predictors of COVID-19 severity and new avenues for treatment in Puerto Rican Hispanics. Acknowledgements: This research was supported in part by UPR COVID19 Emergency Funds, NIGMS PR-INBRE-Institutional Developmental Award (IDEA) P20GM103475, and Research Infrastructure Core components NIMHHD U54-MD007600.

009

## The anti-SARS-CoV-2 IgG1 and IgG3 antibody isotypes against Omicron elicited in a Latin population switch toward IgG4 after multiple doses with the Pfizer-BioNTech vaccine.

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Backgrounds and Objectives. The IgG antibody production is a hallmark of the adaptive immune response and plays essential roles in neutralizing SARS-CoV-2. However, IgG exists in the form of four subclasses (G1, G2, G3 and G4) each with different properties. Previous studies demonstrated that IgG1 and IgG3 are the dominant isotypes elicited during the acute phase of COVID-19. However, the longitudinal evolution of the four IgG subclasses in convalescent subjects and after vaccination wih mRN vaccines has been poorly studied. The present study aimed to characterize the profile of the four anti-SARS-CoV-2 IgG subclasses in naïve or convalescent COVID-19 subjects that received two or multiple doses with the Pfizer-BioNTech vaccine. Methods. In house-IgG ELISAs developed in our laboratory and authorized by FDA for research purpose and a comercial surrogate neutralization assay were used to test serial samples from 115 subjects infected and/or vaccinated with Pfizer-BioNTech vaccine. IRB Samples analyzed in this study were collected by the approved Advarra IRB protocol # Pro0004333 and UPR-MSC IRB # 1250121. Results. We demonstrated that IgG1, which is recognized as an anti-viral antibody, is the most prevalent IgG isotype elicited in subjects that received two doses of Pfizer-BioNTech or Moderna-1273 vaccines. However, a class switch towards the "anti-inflammatory" isotype IgG4 is induced a few weeks after the third dose either in all subjects. The levels of IgG4 remain at high levels for a long period and seem to not be affected either by a subsequent booster dose (e.g., bivalent vaccine) or by breakthrough infections. Immunocompromised subjects, such as those with IBDs receiving treatment with immunomodulators, also showed high levels of IgG4 after the third dose, although these antibody levels have a limited effect on their immune system's neutralizing capacity. Conclusions. Because serum IgG4 is associated to immunological tolerance and many severe medical conditions these results reinforce the need of long-term studies before still administering multiple vaccinations to general population. Acknowledgments: This research was supported by grants of NCI/NIAID No. 1U01CA260541-01 and NIGMS No. U54GM133807.

010

## Unlocking the Potential of Simalikalactone D as an Anticancer Agent in Ethnically Diverse Breast Cancer Populations

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Background & Objectives: Breast cancer remains the most frequently diagnosed cancer in the United States. Among various ethnic groups, Caucasian women face a slightly higher risk of diagnosis than any other demographic. However, black women tend to receive breast cancer diagnoses at an earlier age than their white counterparts and experience higher mortality rates. This project investigates the potential of Simalikalactone D (SKD) as an anticancer agent, exploring its mechanisms of cell death induction and impact on diverse breast cancer cell lines. We included two triple-negative breast cancer cell lines, MDA-MB-231 and MDA-MB-468, which represent diverse ethnic backgrounds, to address cancer disparities across heterogeneous populations. Methods: Using SKBR3, MDA-MB-231, and MDA-MB-468 cell lines, viability assays determined IC50 values of 60.0 nM, 65.0 nM, and 116 nM, respectively. SKD induced cell death via caspase 3-independent pathways. Ongoing experiments aim to elucidate impacted molecular

pathways. Wound healing and colony formation assays were conducted to assess migration and clonogenic potential. Proteomic and phosphoarray analyses are planned for a deeper understanding of SKD's anticancer properties. Results: SKD demonstrated substantial cytotoxicity against all three breast cancer cell lines. SKD's unique mechanism of action, a caspase 3-independent pathway, inhibited migration and clonogenic potential. Ongoing experiments aim to confirm and elucidate the molecular pathways being impacted, underscoring SKD's promise for innovative anticancer treatments. Conclusions: Breast cancer disproportionately affects non-Hispanic white and Black women. This study explores SKD, a natural compound derived from a Puerto Rican plant, as a potential anticancer treatment. Regardless of ethnicity, SKD effectively killed breast cancer cells, offering a differentiated approach from traditional treatments. SKD's unique mechanisms make it a promising candidate for new anticancer therapies, potentially reducing tumor growth and metastasis. Anticipating contributions to more effective treatments and reduced disparities in cancer care. Acknowledgements: This research is supported by PR-INBRE Chapter-V.

## 011

### On-Treatment Platelet Reactivity Variability in a Cohort of Puerto Rican Hispanics Receiving Dual Antiplatelet Therapy with Clopidogrel and Aspirin for Brain Aneurysms Treated using Flow Diverting Stents.

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Introduction: Dual antiplatelet therapy (DAPT) is used to avoid thrombotic complications when placing a flow diverting (FD) stent. We retrospectively evaluated the records of patients with brain aneurysms (BA) treated with FD on DAPT, who had documented P2Y12 Reaction Units (PRU) values. Objective: Determine the responsiveness to DAPT in a Puertorican-Hispanic population undergoing FD placement. METHODS: We retrospectively analyzed the patient records between January 2018 and December 2021. We found 61 patients with BA treated with FD, who were placed preoperatively on DAPT and had documented PRU values using the VerifyNow® assay. Patients who showed PRU values of 71-199 were classified as responders (CR). Those who showed PRU values ≥ 200 were characterized as Non-Responders (CNR). Finally, those who showed PRU values ≤ 70 were characterized as Hyper-Responders (CHR). Results: The cohort was composed of 7 males and 54 females. The mean age was 64 (±10). In the Clopidogrel Responders group: 5 male, 28 female, 3 diabetic and 15 with hypertension. Among the Clopidogrel Hyper Responders group: 1 male, 17 female, no diabetic and 11 with hypertension. In the Clopidogrel Non-Responders group: 1 male, 9 female, 1 diabetic and 6 with hypertension. Within the cohort 54% were Clopidogrel responders, 30% were Clopidogrel Hyper-Responders and 16% were Clopidogrel Non-Responders. The mean platelet reactivity across all patients was approximately 109±69 PRUs, the mean platelet reactivity across CRs, CNRs and CHRs was 100±49, 221±17 and 34±26 PRUs respectively. 5 minor non-thromboembolic complications were reported. Conclusions: We found the combination of Clopidogrel + Aspirin remains a safe and effective DAPT regimen for the pre and post procedural period. Further research and analysis of larger cohorts must be undertaken to determine the true prevalence of Clopidogrel resistance among Puertorican-Hispanics. Our data suggests that 16% of Puertorican-Hispanics are Clopidogrel non-responders and 30% are Clopidogrel Hyper-Responders.

## 012

### Fatty liver infiltration among a sample of pediatric patients in Puerto Rico

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Background and Objectives: Non-alcoholic fatty liver disease (NAFLD) is emerging as a significant health concern among pediatric populations worldwide. This study aims to explore the prevalence of liver fatty infiltration in a sample of Puerto Rican pediatric patients aged 7 to 19, considering weight status according to Body Mass Index (BMI) and gender differences to elucidate obesity's impact on pediatric liver health. Methods: A total of 43 participants, 22 healthy-weight and 21 unhealthy-weight, of which 24 were females and 19 were males, underwent an ultrasound evaluation of the liver using a GE portable Logiqe ultrasound machine to assess liver texture by comparing its parenchyma to the right kidney cortex and spleen to ascertain the presence and extent of fat infiltration, which was classified according to severity: Grade 0 (normal), Grade 1 (mild), and Grade 2 (moderate). Results: The unhealthy-weight group exhibited a higher distribution (61.9%) of mild fatty infiltration than their healthy-weight counterparts (22.7%). Moderate fatty infiltration was only observed in the unhealthy-weight group (9.5%). Normal liver texture was notable in 77.3% of the healthy-weight participants, contrasting with 28.6% unhealthy-weight. Sex differences distribution exhibited females with greater mild fatty infiltration across both weight categories. Males demonstrated an increased distribution in normal liver texture in both weight categories compared to females. Moderate fatty infiltration was only noted in unhealthy-weight males and females. Conclusions: This study highlights liver fatty infiltration prevalence in a sample of pediatric patients in Puerto Rico, stressing the urgency of addressing this issue, especially in childhood obesity. Disparities in unhealthy weight individuals emphasize the need for tailored interventions to mitigate NAFLD's impact. Further research is needed to understand contributing factors and develop effective strategies for pediatric liver health in Puerto Rico. Acknowledgments: Supported by the US Department of Education: Title V Grant Award # P031S200104.

**013**

## A Rare Risk Factor for Pediatric Deep Vein Thrombosis

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Deep vein thromboses (DVT) are uncommon in pediatric patients, and most occur in those with at least one underlying risk factor. We report a case of a 20-year-old female taking combined oral contraceptive pills (OCPs) for polycystic ovary syndrome (PCOS) who presented with acute low back pain. Physical exam was significant for left lower extremity (LLE) edema, tenderness, and erythema. Laboratory testing identified elevated D-dimer at 5.04 mg/L fibrinogen equivalent units (FEU). Bilateral lower extremity venous duplex was remarkable for extensive LLE DVT. The patient had a strong family history of DVT. OCPs were discontinued and therapeutic anticoagulation was initiated. The patient promptly underwent venography which identified May Thurner Syndrome (MTS). Percutaneous angioplasty, mechanical thrombectomy with stent placement, and Inferior Vena Cava filter were performed. MTS is a congenital anomaly characterized by extrinsic venous compression by the arterial system against bony structures in the Iliocaval territory, most commonly of the left Common Iliac vein by the right Common Iliac artery. Compression of the vein leads to vessel wall injury and DVT formation can occur. The patient significantly improved after a second endovascular intervention with stent placement and was discharged to continue therapeutic anticoagulation. This case highlights the importance of having a high index of suspicion for MTS in patients presenting with acute LLE swelling and pain. Early recognition and multidisciplinary interventions are crucial to

lessen the risk of mortality and morbidity from DVT in a patient with MTS. Acknowledgment: We would like to express our gratitude to Irma Ramos, MD from Hospital Cardiovascular de Puerto Rico.

## 014

### Salmonellosis: more than a gastrointestinal disease

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Background: Salmonella, a prominent cause of diarrhea worldwide associated with food-borne disease, is usually self-limiting. However, infants may present with invasive, life-threatening infections such as bacteremia, meningitis, pneumonia, osteomyelitis, and peritonitis. Case Description: We present a case of a 2-month-old female infant missing age-required vaccines who arrived at ED due to salivation, eye-rolling, paleness, sleepiness, and decreased tone since a day before admission. The mother reported dark bowel movements for two consecutive days with intermittent abdominal distention and irritability after feedings. Initial evaluation at another institution revealed a cachectic, fragile, unresponsive, bradycardic, and hypotensive patient who required pediatric resuscitation, intubation, and inotropics. Laboratories were significant for metabolic acidosis but otherwise unremarkable. Imaging showed extensive pneumoperitoneum, prompting an emergent surgery at our institution. Entry into the abdominal cavity revealed abundant bile peritonitis secondary to perforation of the 1st post-pyloric-duodenal portion. Empirical antibiotic therapy was initiated with Zosyn and Flagyl for gastrointestinal coverage, tailored to Rocephin, once blood culture yielded positive for Salmonella group D, and then escalated to Cefepime due to persistent fever and inotropes requirement. Despite not being able to perform a lumbar puncture before starting antibiotics due to abnormal coagulation parameters, therapy was prolonged to 28 days for CNS coverage as she developed focal seizures. A nutritional assessment revealed a change to Nutramigen from Similac pro-sensitive during the first month of life due to poor weight gain and constipation. The latest had a recall by the FDA due to contamination with Chronobacter and Salmonella. Conclusion: This case emphasizes the transmission of Salmonella through infant formula and associated complications, such as bacteremia, peritonitis, intestinal perforation, and meningitis. Highlights atypical presentations like growth faltering that should raise concern for gastrointestinal-related infection and demonstrates how indispensable is a comprehensive history to identify risk factors that prompt adequate diagnosis and treatment for infection with potentially life-threatening complications.

## 015

### Golf cart-related neurosurgical injuries.

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Background and Objectives: Head and spine injuries sustained following golf cart accidents have been rarely analyzed. This study aimed to describe a series of patients sustaining golf cart injuries requiring neurosurgical management for head or spine injuries. Methods: The University of Puerto Rico Neurosurgery database was used to retrospectively identify patients who sustained a golf cart-related injury requiring a neurosurgical evaluation during a 15-year period. The following variables were investigated: mechanism of injury (ejection, rollover, pedestrian), injuries received, Glasgow coma scale score at arrival, days of hospitalization, days at intensive care unit, surgery performed, and outcome upon discharge. This study was reviewed and approved by the institutional review board of the participating institution (protocol #2308131225). Results: The analysis identified 25 patients with golf cart-related injuries requiring neurosurgical management with a median age of 16 (range 4-69). The majority of patients were female (68%). The primary mechanism of injury was ejection from

the cart in 84% of the patients. The most frequent head injury was a skull fracture in 80% of patients. Intracranial hemorrhage was present in 76% of patients, with brain contusions (64%) being the most common. Seventy-two percent of the patients were admitted for surgery or neurological monitoring. The median hospital length of stay among hospitalized patients was 5.5 days. Ten patients were admitted to the intensive care unit with a median stay of 8.5 days. Four patients required surgery for their injuries. At discharge, 80% of patients had a good outcome. Conclusions: Children and adolescents have an increased incidence of golf cart-related neurosurgical injuries and should be closely supervised. Individuals must develop more awareness of the injuries that can be sustained while riding golf carts.

**016**

## International Classification of Retinopathy of Prematurity 3 (ICROP) and a Case for a Paradigmatic Shift

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Purpose: In the extremely complex NICU environment, it is unusual to identify an intervention that could change a prevailing treatment paradigm, such as keeping low transdermal oxygen saturations, to avoid development and progression of retinopathy of prematurity as well as this case does. This disease is most common in preterm infants less than 1,500 gm at birth (BW) and/or a gestational age (GA) of 28 weeks or less. In this instance, a neonatology intervention that included, counterintuitively, keeping the transdermal oxygen saturation above 94% avoided retinal detachment and other complications. Szewczy, TS (1951) reported that early changes of "retrolental fibroplasia" could be reversed by treatment with high concentrations of oxygen of 60 to 70 % and, that the changes would reappear by removing the infants from the oxygen incubator. Cited; G. Pico Retrolental Fibroplasia (ROP) some cases in Puerto Rico (July 1956) Bot. Assoc, Med. de P. R. pp. 288-95 [A. Vargas MS III UPR-SOL]. Case Summary: Male singleton newborn, 24 weeks GA and 670 grams birth weight. Initial retina images: blurred vitreous, optic nerve head, and retina vessels barely seen. Ultrasound: retina attached, opaque vitreous, and unspecified bilateral pre-papillary structures. Blood cultures reported Candida parapsilosis. After intravenous antifungals and negative blood cultures; vitreous cleared revealing moderate Type 1 ROP. Laser applied, but retinopathy relentlessly progressed to Aggressive Type 1 ROP. Transdermal oxygen being 89 to 91%. Prompt neonatal intervention raised and kept oxygen saturation to 94%: progression of retinal disease curtailed. Further Laser applications were not required. Conclusion One of the most significant strategies for the prevention of ROP, a multifactorial disease, includes targeting oxygen saturation. Quality improvement projects and prospective control studies need to be implemented to address the impact of this paradigm shift. IRB Approved: 2290035478R001. Date: 04/13/2023.

**017**

## Impacto de la Telemedicina durante COVID

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Trasfondo y Objetivos: La pandemia del COVID 19 impacto significativamente el acceso de la población a los servicios de salud. La política pública de aislamiento con el fin de evitar contagios resultó en un cambio significativo en los puntos de servicios del sistema de salud. Objetivos: (1) Describir la prestación de servicios de salud a la población en el archipiélago de Puerto Rico en un periodo de 36 meses durante la pandemia del COVID-19. (2) Reconocer el impacto del uso de la tecnología en la prestación de servicios ambulatorios remotos a los participantes del Plan Vital. Metodología: Análisis retrospectivo de seis millones de reclamaciones de servicios médicos ambulatorios, sometidas por los proveedores ante las aseguradoras con código de servicios virtuales o remotos. Resultados: El uso de la telemedicina en la prestación de servicios de salud aumento de forma significativa, de 2019 a 2022. Los varones recibieron más servicios

virtuales y remotos durante los primeros 18 años de edad que las mujeres. El 63.4% de los servicios virtuales que se realizaron durante la pandemia fueron ofrecidos a mujeres. El uso de la telemedicina fue significativamente mayor en 8 pueblos cuando se compara con el total de 78 en la Isla. Las condiciones de salud y diagnósticos más frecuentes se distribuyeron de forma desigual en diversos periodos de tiempo; apareciendo entre los primeros 10 diagnósticos, problemas de salud mental, exposición a enfermedades virales, diabetes e hipertensión. La repetición de recetas, exámenes físicos de rutina e intervenciones administrativas no determinadas fueron identificadas entre las primeras 20 causas para buscar servicios médicos. Conclusiones: El uso de la telemedicina y las políticas implementadas como parte de la política pública durante la emergencia del COVID-19 exige la reformulación del sistema de salud ante emergencias de salud pública.

**018**

## Una intervención interdisciplinaria para el desarrollo de habilidades sociales en estudiantes con doble excepcionalidad

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Trasfondo y Objetivos: Las personas con doble excepcionalidad (2e) poseen una combinación de altas capacidades y áreas de dificultades. Esta comorbilidad provoca doble discriminación en los servicios y apoyos al no atenderse ambas áreas simultáneamente. El desarrollo de las habilidades sociales es de especial necesidad para estas personas. Se llevó a cabo un estudio piloto para explorar la efectividad de una intervención interdisciplinaria (psicología, educación y comunicación, con asesoramiento a padres) en el desarrollo de habilidades sociales de seis estudiantes con 2e. Se llevaron a cabo pre y post pruebas para medir ganancia. Se implantaron actividades durante 12 semanas. La variable dependiente es el desarrollo de habilidades sociales y la independiente es la intervención interdisciplinaria. Método: Múltiples casos únicos con diseño mixto AB para comparar las habilidades sociales evaluadas mediante pre/posprueba comparándose consigo mismo, y calificaciones de logro de los objetivos durante las actividades. Se emplearon cuatro instrumentos evaluativos al inicio y al final, y 15 actividades durante el proceso de intervención. Resultados: Los resultados de las diferencias entre las medidas previas y posteriores, así como las medidas de logro de objetivos durante las actividades indican mejoraría en las habilidades sociales con la intervención interdisciplinaria. Todos los participantes evidenciaron progreso a través de la intervención. Los resultados apoyan la utilidad de una intervención interdisciplinaria con estudiantes con 2e para fortalecer el desarrollo de sus habilidades sociales. Conclusión: Se recomienda la intervención interdisciplinaria para estudiantes con 2e. Las áreas de habilidades sociales fueron identificadas y abordadas adecuadamente. El método de investigación de múltiples casos únicos preexperimental, junto con el uso de varios instrumentos para medir el nivel de habilidades sociales, proporcionó un enfoque adecuado. La experiencia del equipo fue que la planificación interdisciplinaria requiere capacitación e inmersión, apertura entre los miembros del equipo y tiempo para integrar esfuerzos. Agradecimientos: Agradecemos al Instituto FILIUS y a la Facultad de Educación del Recinto de Río Piedras de la Universidad de Puerto Rico por su apoyo en esta investigación. Agradecemos a las doctoras Zambrana, Macksoud y Valdivia y, a las profesoras Pérez y Torres por su participación en la investigación. Fuentes de financiación, divulgaciones de conflictos de intereses: Propuesta subvencionada por FILIUS. IRB 110329-AM. No existe conflicto de intereses.

**019**

## Perfil Interdisciplinario de la Doble Excepcionalidad (2e) en Puerto Rico: Redes de apoyo formales e informales

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Trasfondo y Objetivos: En Puerto Rico es importante estudiar el tema de la doble excepcionalidad (2e), ya que no existe una política pública para esta población

y, por ende, se carece de sistemas adecuados de identificación, evaluación y servicios para atender a esta población estudiantil, lo cual desencadena en doble discriminación. Doble excepcionalidad se refiere a los estudiantes de educación especial o con áreas de debilidades que al mismo tiempo se identifican como dotados o con altas capacidades. Por lo que esta investigación tuvo como propósito identificar las redes de apoyo formales e informales de los participantes, así sobre como son las interrelaciones con el ambiente y el contexto socio cultural o ecológico en el que se desenvuelven para aportar a la visibilidad de esta población y aportar a una propuesta en el futuro de política pública. Método: Esta investigación con un diseño cualitativo, incluyó un equipo interdisciplinario compuesto por profesionales de las disciplinas de educación, piscología escolar, consejería profesional, consejería en rehabilitación y trabajo social. No obstante, para fines de esta presentación se hará énfasis en el procedimiento utilizado por la investigadora en la disciplina de trabajo social, en el que utilizó el genograma y ecomapa para recolectar sus datos. Aprobado por IRB- CIPSHI 2122-040. Conclusiones: Las redes de apoyo con las que cuentan las familias participantes mayormente son las informales y aquellas que ellos mismos pueden proveerle a sus hijos, las cuales no son suficientes, lo que genera un mayor impacto en la familia. Los servicios provistos por el Estado son limitados, a pesar de que la educación se considera un derecho constitucional en Puerto Rico. Es por lo que, a partir de estos resultados, además de continuar ampliando este campo de investigación, es necesario proponer medidas legislativas, así como política pública que brinde servicios a la población con 2e. Agradecimientos: Esta investigación es apoyada con fondos institucionales FIPI.

## 020

## Access to Assistive Technology: Evaluation of the Quality of My Assistive Technology Guide Web App from the Perspective of Older Adults with Functional Disabilities

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Background & Objectives: The use of assistive technology (AT) devices enhance older adults' functionin daily activities. However, Hispanics are among the least likely to use AT, and the lack of awareness of AT has been identified as a major barrier to its adoption. Therefore, our aims were to assess the quality of a web app which provides information on AT, My Assistive Technology Guide (MATG), from the perspective of older adults with physical functional disabilities, and to explore their experience using MATG. Methods: We employed a convergent parallel mixed-method design involving 12 community-living older Hispanic from Puerto Rico. Researchers provided training in the use of the MATG, a Spanish evidence-based web app with detailed information on 97 AT devices and videos demonstrating older people using them. Participants were encouraged to use it for 30 days. Subsequently, we collected simultaneous quantitative data using the User Mobile Application Rating Scale (uMARS) and qualitative data through individual interviews. Quantitative data were analyzed with descriptive statistics, and qualitative data were analyzed through thematic content analysis. Results: The quality of the MATG was rated high in both the objective (mean 3.99 [SD 0.7] out of 5) and subjective (4.13 [SD 1.1] out of 5) domains. Qualitative data fell into seven categories: findable, accessible, usable, desirable, credible, useful, and valuable. Participants provided recommendations to improve the accessibility of the videos of the MATG. Conclusions: The study's findings suggest a positive user experience with the MATG, supported by both quantitative ratings and qualitative insights across various domains, making it a user-friendly and effective tool for accessing information on AT. Future studies should assess the effectiveness of the MATG in enhancing older Latinos function in daily activities through the adoption and use of AT devices. Acknowledgements: This research was supported by HiREC-NIMHD S21MD001830 and the Alliance-NIGMS U54GM133807.

## 021

### A Qualitative Study about the Employment and the People with Legal Blindness Condition in Puerto Rico

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Background and Objectives: Employment is a determinant of health (WHO, 2023). Already 244,572 persons had visual conditions in Puerto Rico (ACS, 2022). Literature showed that people with visual conditions face obstacles that prevent them from integrating into the workforce, which affects their health. Consequently, this study aimed to answer how the Workforce Innovation and Opportunity Act (WIOA) and the Law 51 of the Puerto Rico Department of Education (1996) facilitated or limited labor market integration and quality of life for this population. The Ecosocial Theory (Dr. Krieger) was used as a theorical framework. Methodology: The study design was a qualitative study case. Data collection was through in-depth interviews with 14 key informants from PR agencies and organizations, and 16 people with legal blindness recruited by snowball, a letter of invitation and by availability through community-based organization and documents. All participant rights and welfare were safeguarded. The study period began June 2021 through November 2023. The inclusion criteria were adults identified as legally blind, aged 21 to 64 years, that speak spanish and residents of Puerto Rico, employed or not employed and capacity to consent. Inclusion for the key informants were: 21 years or older, that speak spanish, having capacity to consent, resident of Puerto Rico, holding a managerial position related to employment of people with visual conditions. The research team designed an interview guide and a short demographic validated by experts. The data analysis used a thematic content method and triangulation of data. Approved by IRB-Protocol B0630121. Results: The main themes included experience with reasonable accommodation, curricula adaptation, support to employment, transition to adulthood and independent life and work apprenticeships experiences. Conclusions: The results supported the need to consider social determinants in addition to Law WIOA and Law 51 considerations for successful integration into the workforce and maintain people's health.

## 022

### Qualitative outcome evaluation for Intimate Partner Violence Program Designed for a Health Clinic Workforce

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Abuse and violence is everyone's problem therefore whole community must be involve in its prevention. Health practitioners have a role in dealing with these issues and need to play their part in prevention, identification and response. However multiple barriers seem to impact the degree of involvement in violence prevention. The objective of this project is to report the findings of focal groups done after the implementation of an intimate partner violence (IVP) program. Structured focus groups were organized after a face validation of the questions was made. Groups varied from 3 to 6 people and a facilitator, and a scribe join the participants to assure quality of the findings. Results show that work burden was significantly pointed also some of the participants express they need more training to appropriately manage cases. Participants also reported to be more aware of violence and patterns conducting to violent incidents. Other findings like compensation, perception etc. are also discussed in this presentation. In conclusion a single intervention on IVP is helpful to acknowledge violent patterns and to identify with the victims to aid.

## 023

### Apresto Comunitario y Conocimiento del Equipo de Trabajo e Integrantes en la Formación de Coaliciones Comunitarias en Puerto Rico

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Trasfondo y objetivos: Las coaliciones comunitarias promueven la participación en la solución a diversas problemáticas sociales, a la vez, que son un vehículo para trabajar de manera colectiva e impulsar cambios sociales. Esta presentación tiene como objetivo explorar el apresto comunitario y el conocimiento que deben tener el equipo de trabajo y los integrantes en la formación de coaliciones comunitarias. Metodología: Esta es una investigación cualitativa, exploratoria y descriptiva. La muestra se conformó de 20 participantes. En esta presentación se hará referencia a los cuatro participantes pertenecientes, específicamente, a la categoría de personas claves. A este grupo se le realizaron entrevistas virtuales a profundidad, las cuales fueron audio grabadas, y un cuestionario de datos sociodemográficos autoadministrado. Se realizó un análisis de categorías con la información recolectada. Aprobado por el IRB: 008-2018-19. Fecha: 2/3/2021. Resultados: Dentro de las categorías identificadas, enfocamos esta presentación en los resultados obtenidos en relación con el apresto comunitario y el grado de conocimiento que deben tener el equipo de trabajo y los integrantes de las coaliciones. Identificamos el apresto comunitario como un factor clave en la capacidad de la comunidad para reconocer o movilizarse para atender y/o trabajar con la problemática en cuestión. Por otra parte, las personas clave identificaron que el conocimiento del equipo de trabajo y los integrantes debe ser diverso. Esto incluye procesos comunitarios y liderazgo. Conclusiones: Entendemos que, para impactar las necesidades comunitarias, es vital que exista el apresto para trabajar e identificar soluciones. Asimismo, es importante la diversidad en conocimientos y experiencias que tengan el equipo de trabajo y los integrantes de las coaliciones. Esto facilitará el trabajar de manera colectiva y estratégica. Agradecimientos: Agradecemos a las personas que participaron en la investigación, la cual fue un esfuerzo voluntario.

## 024

### Screening of novel Rac/Cdc42 protein inhibitors as anti-metastatic compounds

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Background and Objectives: Despite advances in cancer research, no effective targeted therapy is available to prevent and treat metastasis. Homologous Rho GTPases Rac and Cdc42 have a crucial role in the signaling pathways that regulate cell survival, proliferation, and migration, so the dysregulation of these proteins leads to cancer progression and metastasis of different tumors. Targeting these regulatory proteins results in anticancer and antimetastatic activity, as observed with our dual Rac/Cdc42 inhibitor, MBQ-167, in triple-negative breast cancer. We aim to identify MBQ-167 derivatives with similar or greater efficacy and specificity in inhibiting these GTPases to provide additional therapeutic alternatives for metastatic cancer. Currently, over 30 different compounds are being evaluated for inhibition of Rac and Cdc42, and cytotoxicity in metastatic cancer cell lines. Methods: Inhibition of Rac and Cdc42 is determined by using Rac/Cdc42 activity assay. In this assay, agarose beads containing the protein binding domain of p21-activated kinase (PAK), a direct downstream effector of Rac/Cdc42, are used to pull down the GTP-bound (active) form of these proteins. Effects on cell viability and cytotoxicity of the compounds are determined by performing an MTT assay. This assay uses formazan formation as an indicator of viable cells after the solubilization of the purple-colored crystal products. Results: Potent Rac-1 inhibitory activity at nanomolar concentrations of some of these derivatives was observed. One of the compounds, CPV-337, showed GI50 of ~55nM and ~70% Rac activation inhibition

at 50nM, therefore being 2X more effective than our leading compound MBQ-167 (IC50 ~100nM for Rac/Cdc42 inhibition; GI50 of 130nM). Conclusions: Our search for derivatives with improved efficacy and specificity has led to identifying several potential compounds, with CPV-337 standing out. Further evaluation of these compounds must be done to identify the most potent inhibitors for translational development as anti-metastatic cancer therapeutics. Acknowledgements: This research was supported by G-RISE program, Puerto Rico Science, Technology, and Research Trust (PRSTRT), NIH.

## 025

### Genetic causes of heterotaxy in patients: Modeling HOXB8 and CFAP54 in Xenopus tropicalis

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Background & Objectives: Cardiac looping is directed by genes that establish the left-right (LR) axis during early embryonic development. Failure to properly pattern the LR axis can lead to heterotaxy, a disorder with high morbidity and mortality. A de *novo* mutation in *HOXB8* was found in a pediatric patient with dextrocardia, left atrial isomerism, common atrioventricular valve with tetralogy of Fallot and an interrupted inferior vena cava. Another pediatric patient with dextrocardia, double outlet right ventricle and left atrial isomerism, was seen with compound heterozygosity for two variants in *CFAP54* expression. Previous animal models with any of these mutations have skeletal defects or primary ciliary dyskinesia, but no left-right phenotypes. This study aimed to assess the role of *HOXB8* and *CFAP54* in establishing the LR axis by observing heart looping directionality in *Xenopus tropicalis* embryos. Methods: Single-celled *X. tropicalis* embryos had knockout of *HOXB8* or *CFAP54* genes using CRISPR/Cas9. Embryos were sorted according to heart looping directionality and CRISPR cutting efficiency was analyzed via Sanger sequencing and Interference of CRISPR Edits (ICE) analysis. IACUC Approved: 2021-11035. Date: 1/14/2021. Results: The study demonstrated a biologically relevant percentage of abnormal heart looping at stage 42 embryos of *X. tropicalis* with *CFAP54* knockout only. In contrast, *HOXB8* does not seem to have a role in cardiac looping; abnormal heart looping percentage was biologically insignificant. We also validated that *X. tropicalis* is an effective model for functional characterization of *HOXB8* and *CFAP54* seen in human patients. Conclusions: Our results suggested that *CFAP54* has a role in the LR axis determination, affecting heart development patterns. Further studies should aim to examine whether *CFAP54* knockouts affect the expression of the heart looping effector gene *Pitx2* via in situ hybridization. Acknowledgements: Maura Lane and The Khokha Lab; Yale School of Medicine Summer Research Program, DICE Office; patients that inspired these studies

## 026

### The Role of Tip60-HAT in PDF Neuropeptide Expression and Alcohol Tolerance Acquisition

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Alcoholism is a condition characterized by behavioral and physiological changes, which can significantly impact an individual's health and interpersonal relationships. After prolonged alcohol consumption, the organism induces neuroadaptations that lead to tolerance, dependence, and alterations in sleep patterns and circadian rhythms. *Drosophila melanogaster* has emerged as an effective model for studying alcohol neuroadaptations due to its behavioral responses to alcohol that closely resemble those observed in humans. Here, we explore the role of the histone acetyltransferase (Tip60) in regulating alcohol responses through its modulation of the ventrolateral neuronal system (LNv) of *Drosophila*. These neurons are known to regulate the sleep/wake cycle in *Drosophila*. We hypothesized that Tip60 would

have a significant role in the capacity of *Drosophila melanogaster* to acquire ethanol tolerance. Using the UAS-Gal4 system to knockdown Tip60 expression in LNv neurons (pdf-Gal4/UAS-Tip60-RNAi), we record the activity of flies during alcohol exposure and measure alcohol sensitivity and tolerance against age-matched adult female flies. In parallel, we assessed the expression of the neuropeptide PDF to study the involvement of Tip60 in regulating PDF expression and LNv branching pattern. We found that Tip60 knockdown flies display increased alcohol sensitivity and reduced alcohol tolerance. Moreover, we found that Tip60 knockdown in LNv neurons leads to a significant reduction in the LNv branching pattern and that alcohol exposure exacerbates this reduction in pdf-Gal4/UAS-Tip60-RNAi flies, decreasing overall LNv neuronal branching. These results suggest that Tip60 regulates alcohol tolerance acquisition and brain branching patterns of LNv neurons. Understanding the molecular and cellular mechanisms underlying ethanol neuroadaptations can potentially lead to identifying new therapeutic targets for alcohol-induced disorders.

## 027

### Impact of neoadjuvant radiation on lower esophageal and gastro-esophageal junction adenocarcinoma

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Background: Esophageal adenocarcinoma (EAC) poses a therapeutic challenge due to late-stage presentation requiring multimodal management. Current guidelines recommend the use of neoadjuvant chemoradiation on patients with locally advanced stage EAC based on higher rates of R0 resection. Recent literature has challenged the morbidity and survival benefits with the use of neoadjuvant radiation. Materials and Methods: We present a retrospective cohort study based on the use of neoadjuvant chemoradiation for EAC. We compared baseline patient characteristics, staging, pathology reports and outcomes between patients who received neoadjuvant chemoradiation to those who did not. IRB Approved: 2022-06-74. Date: July 22,2022. Results: Patient demographics in both cohorts did not display major differences in terms of age or stage presentation. Analysis of the data did not display significant differences in tumor response, early postoperative mortality (p=0.58), one year survival (p=0.7), or post-surgical complications such as dysphagia, surgical site infection (p=0.57). Tumor staging showed a significant decrease in T3 tumors when compared to non-neoadjuvant radiotherapy groups. There was an increase in the incidence of T4 tumors. Conclusions: Our results did not show any statistically significant differences in postoperative complications, tumor response nor postoperative mortality with the use of neoadjuvant chemoradiation versus no neoadjuvant chemoradiation. The study supports further research into defining who may benefit from neoadjuvant chemoradiation in cases of surgically resectable EAC.

## 028

### Antiplasmodial activity of anti-tubulin compounds and expression analysis of Plasmodium falciparum, P. vivax, and P. berghei tubulin genes

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Background and objectives: Malaria is a parasitic disease affecting millions of people globally. Its causative agents are members of the *Plasmodium* genus of apicomplexans, causing morbidity and mortality worldwide. The emergence of multidrug-resistant parasites highlights the urgent need to identify new targets and novel compounds. Plasmodial tubulins have been predicted as potential drug targets. A series of 183 novel compounds based on drugs that bind to the colchicine-binding site of tubulins were previously synthesized. This study

focused on determining the expression of tubulins in the parasite's life cycle to predict the compounds' activity and assess antiplasmodial activity at multiple parasitic stages. Methods: Gene expression analysis of the human *P. falciparum* and *P. vivax* and rodent malaria *P. berghei* species was done using online databases (PlasmoDB and Malaria Cell Atlas) to determine in which stages of their life cycle the tubulins are expressed. The antiplasmodial activity of the compounds was tested on the asexual life cycle stages and the sexual ookinete mosquito stages of *P. berghei* parasites via in vitro drug luminescence assays. Results: Tubulins were expressed across the life stages of the species selected, though the expression of tubulins was found in the asexual and gametocyte stages of the parasites. Nine of 183 synthesized compounds demonstrated activity against the asexual stages of the parasite at concentration ranges from 2 µM to 7.9 µM. Moreover, two of these compounds showed activity against the ookinete stages in vitro. Conclusion: Tubulin genes were expressed throughout the parasites' life cycle. The novel anti-tubulin compounds show antiplasmodial activity in blood and ookinetes stages and warrant further research. Acknowledgments: This research was funded by RCMI grant U54MD007600 and 5R25GM061151-22.

## 029

### Ethanol-Induced Epigenetic Modifications: A Gateway to Altered Sleep Behavior in Drosophila melanogaster

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Background and Objective: According to the National Institutes of Health (NIH), a significant percentage of adults (7-19%) experience insufficient sleep, and approximately 60 million Americans suffer from chronic sleep disorders. Additionally, alcohol abuse has been shown to cause sleep disturbances by affecting gene expression and sleep homeostasis. Using Drosophila melanogaster flies to assess the neuroadaptations induced after ethanol exposure, has been possible to study alcohol-responsive genes. Particularly, transcriptomics approaches have shown epigenetic mechanisms as essential to ethanol sensitivity and tolerance acquisition. Methods: Here we focus on the role of epigenetic modulators genes, Tip60 and nej over Drosophila's sleep behavior. The ventrolateral neurons (LNv) are considered the "main core" of the fly circadian rhythms and sleep homeostasis, thus we wonder whether epigenetic mechanisms involved in ethanol neuroadaptation affect sleep behavior in Drosophila. We disrupted two epigenetic modulators, (Tip60 and nej genes, histone acetyltransferase and deacetylases, respectively) using UAS-GAL4 system to express RNAi to knockdown these genes into the LNv neurons and monitoring the effects of this manipulation over sleep behavior in adult female flies. Results: Our data show that flies expressing RNAiTip60 into LNv neurons have decreased fraction of time sleeping, suggesting Tip60 knockdown into LNv plays a role modulating sleep behavior in flies. Moreover, expressing RNAinej increases the fraction of time sleeping in flies. Conclusion: We propose epigenetic modulators play a role, not only regulating ethanol responses in flies, as well modulating sleep homeostasis with ethanol-responsive genes as modulators of LNv gene expression necessary to develop normal sleep behavior. Acknowledgements: I want to thank the members of Dr. Alfredo's Ghezzi lab, PR-LSAMP, Center of Neuroplasticity of the University of Puerto Rico (COBRE), IDeA Network of Biomedical Research Excellence (PRINBRE) and the University of Puerto Rico for helping me through ought this project.

## 030

### Characterization of Myeloid-Derived Suppressor Cells in Response to Restraint Stress in Preclinical Models of Ovarian Cancer

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Background & Objectives: Ovarian cancer (OC) is the fifth- and seventh-leading cause of cancer death among females in the United States and Puerto Rico, respectively. Chronic stress has been shown to increase tumor-associated inflammation, immunosuppression and promote disease progression. Myeloid-Derived Suppressor Cells (MDSC) are immature and immunosuppressive cells that play a key role in the tumor microenvironment (TME). Tumor-associated MDSCs aid immune evasion and are associated with poor prognosis in cancer patients. However, the role of chronic stress on MDSC infiltration and function in OC is poorly understood. This study aims to determine the role of chronic stress on MDSC biology in the OC TME. We hypothesize that chronic stress enhances MDSC infiltration into OC TME and drives OC progression. Methods: To address this, we inoculated 3 to 4-month-old C57BL/6 female mice with ID8 or IG10 OC cells and subjected them to restraint stress (2 hours daily) for 6-8 weeks. Unstressed mice were used as controls. Upon sacrifice, tumors were collected for immunofluorescence (IF) and flow cytometry (FC) analyses to characterize MDSC by the expression of cell surface markers (CD11b+ and Gr-1+ (Ly-6G/Ly-6C). In addition, we performed bone marrow isolation from C57BL/6 mice to obtain myeloid cell precursors and differentiate them *ex-vivo* into MDSCs using GM-CSF and IL-6. Once the cells were differentiated into MDSC, we exposed them to stress hormones for 72 hours and analyzed MDSCs populations *via* FC. Approved by IACUC: 2004000282. Date: 5/19/2021. Results: Our results suggest that chronic restraint stress led to increased infiltration of MDSC in the TME in ID8 ($p$=0.0001) and IG10 ($p$=0.0013) mouse models. FC results show increased infiltration of MDSC ($p$=0.04) in IG10 tumors and enrichment of polymorphonuclear-MDSCs in stress hormone-treated groups. Conclusions: These results suggest that chronic stress can regulate MDSC infiltration and function, enhance the immunosuppressive nature of the OC TME, and lead to disease progression. Acknowledgements: This work was funded by the National Cancer Institute (R21CA253555, U54CA163071) and the National Institute on Minority Health and Health Disparities (U54MD007579). AAA and YAR were supported by the National Institute of General Medical Sciences (R25GM082406 and T32GM144896).

## 031

## Engaging Stakeholders Through Generating Research Opportunities Working Together For Puerto Rico Network

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Introduction: Team-based stakeholder engagement enables the translation of research data into evidence-based practices across academia and institutions. The Hispanic Practice-Based Research Network, known as Generating Research Opportunities Working Together for Puerto Rico (GROW PR Network), was established in 2021 to foster collaboration among healthcare providers, researchers, and community stakeholders. This project aims to demonstrate how the GROW PR Network engages stakeholders to develop, implement, and disseminate collaborative research initiatives. Methods: A semi-structured 45-minute group activity held on December 19, 2023, using Team-based learning strategies, and context analysis. Twenty-four multi-sectorial participants from PR engaged in collaborative exchange of research ideas based on their experiences, and the community and patients' needs. Four (4) groups were arranged, and three prompts were used to develop a draft with a main concern, collaborative research to address the concern, and a main topic: community, patient, or healthcare services. IRB/ IACUC approval number: IRB Number: 2290034094A001. Results: Three (3) groups identified the need to increase access to healthcare services for populations with chronic health conditions, mental health, and services for HIV and LGBTQI+ communities. One (1) group identified the opportunity to research medical literacy between clinicians and patients in rural areas of Puerto Rico. All groups generated collaborative strategies involving multisectoral organizations and key players. Other findings were to increase accessibility to medical services, improve communications, in inter and intra organizational participation. Conclusion: The strategies implemented are useful in fostering

participation, forming partnerships, identifying gaps, and encouraging involvement in research. Next steps include mentoring, advisory and pairing multisectoral groups to generate research opportunities working together for Puerto Rico. FUNDING: This research was supported by award number U54GM133807.

## 032

### Increasing Patient Attendance At Clínicas Padre Venard Through A Community Outreach Program

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Introduction: Clínicas Padre Venard, a student-run free clinic in Old San Juan affiliated with Saint Francis Church and Hogar Padre Venard, serves middle-aged, unhoused, and low-income individuals. The clinic faced challenges with low attendance, averaging 3-4 patients per session in 2021-2022. Restlessness and frustration among patients were common due to extended waiting times and a lack of a proper lobby. To address these issues and enhance community building, the board initiated an outreach project from September 2022 - December 2023. Methods: During the 2022-2023 academic year, the community outreach department implemented a meal and social environment initiative to boost patient attendance and improve the clinic experience. The initiative focused on (1) creating a welcoming waiting room, (2) fostering socialization, and (3) providing healthy meals. Volunteers engaged with patients personally, encouraged 1:1 interaction, and allowed them to choose their preferred entertainment. Free clothing, warm meals, water, snacks, and takeaway meals were offered, with active feedback collection for continuous improvement. Results: Clinic attendance doubled from 52 visits in 2021-2022 to 111 in 2022-2023. Follow-up adherence also increased. The ongoing 2023-2024 initiative has cared for 63 patients, surpassing the previous years (26 and 42 patients during the same period in 2021-2022 and 2022-2023). Conclusion: The meal and social environment initiative exemplifies the efficacy of population-specific care in overcoming barriers to medical access. By addressing the community's challenges through access to food, entertainment, and clothing with respect and empathy, the waiting room experience was improved. This approach positively impacted clinic attendance and strengthened doctor-patient relationships.

## 033

### Age variation in preventive vaccine uptake among women with HIV in the presence of high COVID-19 immunization rate in Puerto Rico

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Introduction: COVID-19 vaccination rates were high in Puerto Rico reaching rates of 80% for some age groups. Prior to the COVID-19 pandemic adults and parents of young children expressed different concerns with immunizations depending on the type of vaccine. Women with HIV are vulnerable to infections that can be prevented with vaccines including HPV-related. Communities are more prone to accept vaccinations when concerns about epidemics are ongoing. Methods: COVID-19, influenza, pneumococcal disease, hepatitis B, and HPV vaccination data from 829 women living with HIV receiving care at the Maternal-Infant Studies Center (CEMI) in PR between 2012 and 2022 was obtained from charts and Vaccine registries. CEMI is a multidisciplinary longitudinal Ob/Gyn clinic dedicated to scientific research and clinical services to women living with or at risk for HIV. Eligible women had to have a Puerto Rico Electronic Immunization System (PREIS) and/or a CareWare (CW) account. Findings: COVID-19 vaccination rates were high for women of all ages (83%). The majority (82.62%) of 489 women with HIV > 45 years were vaccinated against COVID-19 in contrast to 69% for those younger than 45. Influenza vaccine rates were higher for those older than 45 (85.3% vs 14.6%) for 2021. Hepatitis vaccine rates were higher for those younger than 45 (56.18% vs 31.8%) while pneumococcal rates were similar (55.42% vs 46.76%). HPV vaccine coverage was very limited due to lack of access and insurance

coverage. Conclusions: Older patients have better vaccination rates than younger probably due to their perception of risk. The vaccination messages need to be tailored to increase vaccination rates for specific vaccines (hepatitis, Influenza) among those that are more vulnerable such as women with HIV. Efforts to increase access to HPV vaccinations need to continue and clinic quality of care projects should consider strategies to increase coverage of such preventive vaccines.

## 034

### Ocurrencia de "Diabetes Burnout" en adultos con Diabetes Mellitus Tipo 1 y su relación con el control en niveles de glucosa

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Trasfondo y objetivos: El automanejo de la DT1 es un reto que los pacientes trabajan diariamente y como consecuencia pueden presentar el "Diabetes Burnout" (DBO) o un agotamiento físico, mental y emocional, que conduce a la indiferencia en el control de la condición. El propósito del estudio fue describir la ocurrencia de DBO y explorar la asociación entre DBO y el control de los niveles de glucosa. Método: Diseño descriptivo-correlacional; se reclutó una muestra de 90 adultos, con DT1, en un grupo de apoyo de Facebook. Los datos se recopilaron electrónicamente con el usó de la "Diabetes Burnout Scale" y el autoreporte del valor de la hemoglobina glucosilada (HbA1C). Resultados: El 61.1% de la muestra se encontró en control de la diabetes (HbA1c ≥ 7%). La media total de DBO fue 2.76 (DE= 0.70). La media para el agotamiento fue 3.77 (DE=1.03), seguido de la pérdida de control (M=2.81, DE=0.96) y el desapego (M=1.93, DE= 0.68). Se encontró diferencia estadísticamente significativa entre las medias totales de DBO en el grupo con control de la condición (M=2.54) y el grupo no en control (M=2.90) (p=0.021). En la dimensión de pérdida de control en el grupo con control de la condición la media fue 2.48 y en el grupo no en control fue 3.02 (p=0.008). La media de las puntuaciones de desapego en el grupo con control de la condición fue 1.60 y en el grupo no controlado fue 2.00 (p=0.021). Conclusión: El agotamiento emocional fue la dimensión con mayor valor y se identificó asociación entre las puntuaciones generales de DBO, desapego y pérdida de control con el control de la diabetes. El identificar el DBO y sus dimensiones es importante para brindar un cuidado integral al paciente, con un enfoque psicosocial y emocional, e implementar estrategias para su prevención y reducción. Agradecimientos: Sra. Yoly Haiyan Rivera Cabrera, fundadora y administradora del grupo de apoyo Yo Soy Tipo 1 en la plataforma social Facebook, y a la Sra. Sofía Bauzá, enfermera de la Fundación Pediátrica de Diabetes.

## 035

### Análisis de los elementos prevalentes asociados a la Responsabilidad Social Corporativa en relación con los hospitales como elementos clave de los sistemas y sectores de salud

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Trasfondo y Objetivo General: A nivel global, existe un creciente interés por adoptar un enfoque ecológico amplio que permita reconocer que la salud es "producida" por la interacción compleja entre factores ambientales, biológicos y de comportamiento que operan a lo largo de la vida de un ser humano dentro del contexto de comunidades y poblaciones. Los hospitales como organizaciones inherentes a los sistemas y sectores de salud son considerados un elemento esencial para alcanzar la Cobertura

Universal de Salud y los Objetivos de Desarrollo Sostenible. Es por eso por lo cual, es necesaria la comprensión de vías de acción para el sostenimiento de tales entidades. De esta manera, el objetivo de esta investigación es analizar los elementos prevalentes asociados a la Responsabilidad Social Corporativa (RSC) en relación con el marco general organizacional de los hospitales como elementos clave de los sistemas y sectores de salud. Métodos: El propósito de esta investigación se alcanzó mediante una metodología de investigación cualitativa de alcance descriptivo. Los datos necesarios para lograr el análisis fueron recolectados a través de una revisión de literatura sistemática siguiendo los pasos del método Cochrane. El análisis consistió en la evaluación de la información prevalente relacionada a la RSC en relación con los hospitales como organizaciones clave para la prestación de servicios de salud desde los sistemas y sectores de salud. Tal análisis de datos y la realización de los metaanálisis necesarios se lograron mediante el estudio de los contenidos en 27 publicaciones que prevalecieron para el análisis final y que superaron al escrutinio de validez establecido. Conclusiones: Los productos de este estudio permitieron la generación de temas o categorías pertinentes para abonar a la comprensión de la importancia de integrar elementos de la RSC a las prácticas organizacionales de los sistemas y sectores de salud. Agradecimientos: Ninguno.

## 036

### Proyecto Interprofesional de Liderazgo Estudiantil en Profesiones de la Salud: Lecciones aprendidas en la implantación de una iniciativa innovadora.

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Trasfondo y Objetivos: En la Educación Superior, existen estudiantes líderes que se destacan por representar a sus pares durante su experiencia educativa, en vías de prepararse para formar parte del campo laboral. A tales efectos, se diseñó el Proyecto Interprofesional de Liderazgo Estudiantil (PILE) de la Escuela de Profesiones de la Salud del Recinto de Ciencias Médicas-UPR. Este Proyecto se ofrece co-curricularmente, a estudiantes que ocupan posiciones de liderato durante su formación académica, en las diferentes escuelas del Recinto. Los objetivos son: 1) Fomentar el desarrollo de competencias de liderazgo. 2) Facilitar los roles de los estudiantes en la comunidad universitaria. 3) Promover la interacción y el aprendizaje en educación interprofesional. Método: Los talleres son ofrecidos una vez al mes por recursos especialistas que utilizan aprendizaje activo. Desde una metodología didáctica constructivista, los estudiantes co-construyen conocimiento significativo, mediante un diálogo activo con los docentes como mediadores. Al finalizar el año académico, los participantes presentan conocimientos y actitudes que aprendieron en el Proyecto y cómo pudieron aplicarlo en sus funciones y actividades como líderes. De esta manera, se analizan las experiencias desde la perspectiva fenomenológica. Resultados: A partir de los beneficios alcanzados por los estudiantes en el desarrollo o fortalecimiento de competencias sobre liderazgo, los facilitadores del Proyecto han obtenido valiosas experiencias y estrategias para fortalecer sus destrezas como educadores interprofesionales y promover el desarrollo de líderes. Conclusión: PILE es un programa idóneo para promover el liderazgo y el bienestar estudiantil en un contexto de Educación Superior y contribuir así en los aspectos académico, clínico, social y comunitario de las profesiones de la salud. Agradecimientos: Se agradece a la Dra. Dorelys Rivera- Dávila por su contribución en la conceptualización e implantación inicial del Proyecto, a los recursos conferenciantes y a los estudiantes participantes, por su tiempo y disposición.

## 037

### Multifocal Mixed Periapical Lesion in Routine Radiographic Investigation: A case report

*Alyssa Fray, BS. Mona School of Dentistry, University of the West Indies, Jamaica*

Purpose: To understand the role of clinic-radiological correlations in dental diagnosis. Methods: A 64-year-old female patient visited the Dental Polyclinic at Mona Campus with a complaint of a fractured upper

right central incisor in January 2023. The trauma history revealed a tendon injury in the foot for which she received medical and physiotherapy attention. Following her recovery, she visited the dentist to manage the central incisor. Results: Intra-oral examination revealed an asymptomatic upper right central incisor, which showed fractured structures involving enamel and dentin. Periodontal examination showed signs and symptoms of generalized chronic periodontitis. Routine radiographs were taken to ensure the integrity of pulpal and periapical structures. The entire mouth radiograph also revealed multifocal involvement of varying intensity of mixed radiographic changes in periapical regions of maxillary incisors, mandibular anterior, and mandibular molars. Conclusion: This case discusses the accidental discovery of multifocal mixed radiographic presentation and its relevance in dental management in general dentistry care. Identifying the characteristics of a multifocal involvement lesion raises the suspicion of cement-osseous lesions.

## 038

### Dental Management of a Prostate Cancer Patient Scheduled for Radiation Therapy

*Keziah Laxman, Morrissa Roberts, Thaon Jones. School of Dentistry, Faculty of Medical Sciences, The University of the West Indies, Jamaica*

A 73 year old male patient visited Mona School of Dentistry for a dental clearance prior to the cancer therapy. However, the patient was interested to get a denture as part of this dental visit. The medical history revealed the recent diagnosis of high risk prostate cancer and scheduled for radiotherapy. Oral examination revealed multiple carious tooth, non-carious lesions, missing teeth. Gingival examination revealed supra-gingival calculus, significant gingival recession, shallow pockets with mild to moderate level of inflammation. Full mouth radiographs were taken on dentulous areas. Radiographic examination showed generalized bone loss. Patient was management as per the protocols for dental clearance of a patient who is scheduled for cancer treatment. All the dental problems were addressed except prosthetic needs of patient, which is scheduled during dental visit upon completion of cancer treatment. This presentation highlights the importance of dental management and emphasizes the role of pre- intra- and post cancer treatment.

## 039

### Excisional Biopsy in Focus: Investigating a Clinically Diagnosed Case of Oral Pyogenic Granuloma

*Leela Devi Sivaraj, Judith McKain-Rubin. Kornberg School of Dentistry at Temple University*

The presentation describes a case involving a 72-year-old woman with a painless gingival swelling in the upper anterior tooth area that persisted for over 7 months, causing discomfort while speaking and eating. The swelling was localized, red in color, and had an oval, sessile shape with a smooth surface. Bleeding was observed upon probing, yet there was no noticeable mobility of the maxillary central incisor. Clinical palpation confirmed the findings. The provisional diagnosis indicated a pyogenic granuloma based on medical history, dental examination, and intraoral observations. Additionally, the intraoral periapical radiograph of teeth #8 and #9 showed an intact lamina dura, no bony changes, and incomplete root canal treatment on tooth #9, suggesting a soft tissue lesion.

## 040

### Alternative Procedure to Calculate the Basic Reproduction Number in Epidemiology

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Background & Objectives: In epidemiology, a dimensionless number called the basic reproduction number ($R_o$) is a key parameter. In fact, an outbreak is expected to continue if $R_o$ >1 or died out if $R_o$ <1. Because it is difficult to measure Ro from seroepidemiologic data, compartmental biomathematical models are frequently employed to obtain an analytical expression for $R_o$. A review of

the literature shows that the *Next-Generation Matrix (NGM)* method is the only approach used to obtain $R_o$ The main objective in this research is to develop an independent procedure (other than *NGM*) to obtain the value of $R_o$. Methods: The proposed alternative procedure is based on the study of the endemic equilibrium. It requires to solve the coupled differential equations of a given compartmental model in terms of the infectious population ($I_p$). Within a compartmental model framework, we have provided a five-steps recipe to calculate $R_o$. Results: We take several compartmental models (*SIR*, *SEIR*, *SEIL*, and *SVEIRD*) published in the literature. Thereafter, we show that the values of $R_o$ for each compartmental model using the alternative proposed procedure, are the same as the given by the standard methods (*NGM*). Conclusions: For one or two forces of infection, we show that $I_p$ satisfies a linear or quadratic equation, respectively. Interestingly, all information required to obtain $R_o$ is embedded in the constant term of the linear or quadratic equations. Besides its intrinsic interest, the advantages of the proposed alternative procedure as compared to the *NGM* method are: i) uses only basic algebra, whereas *NGM* requires linear algebra. ii) explain easily why $R_o$ >1, implies the existence of an endemic disease. iii) It provides an independent procedure to verify the value of $R_o$ as calculated by *NGM*. Acknowledgements: This research was partially supported by the University of Puerto Rico, Humacao-campus, and by PR-LSAMP.

## 041

### The Vieques Septic Systems Project

*Jorge L. Nina Espinosa. Department of Natural and Environmental Resources Water Quality Area*

In September 2013, the Vieques Conservation and Historical Trust (VCHT) received grant funding from U.S. EPA to survey the status of old decaying septic systems, which discharge into the nearby creeks and ocean in five densely populated waterfront neighbourhoods on north coast of Vieques, P.R. The research objectives were to educate low-income residents about the potential water pollution and public health threats posed by the deteriorated septic systems on the local water bodies surrounding the affected communities. In addition, we need to increase public awareness of arbovirus diseases like dengue, chikungunya and zika and develop recommendations for future plans to remedy the situation. Were conducted to inform the community of the project, educate about the health risks presented by septic systems that are not working properly, educate about how to properly construct and maintain a septic system, educate about modern technology for septic systems or alternatives to traditional systems. Field observations and measurements were used to identify the conditions of those systems to which we were provided access. Maps were created presenting various proposed solution alternatives, specific to the characteristics of the communities Tortuguero, Lucila Franco, Monte Santo Playa, Morropó and Bravos de Boston. The field study was carried out from April to June 2015 to June 2018. The goals of the project were producing an inventory of septic tanks located on the north shore of Vieques in five communities, educate the community regarding the proper maintenance of their existing septic systems, the proper way to build a new septic system, new technologies available and improvement public health of the communities. We need to recognize the efforts from the communities, NGO, government (municipal, state and federal) and private sector.

## 042

### El acceso abierto en las revistas académicas electrónicas en temas de ciencias de la salud en el Arco Insular del Caribe

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Trasfondo y objetivos: el conocimiento se beneficia del nivel de desarrollo del Acceso Abierto (AA) que alcanzan las revistas académicas en la medida en que éstas reducen o eliminan las barreras económicas, legales y tecnológicas del acceso a la información. Explorar el nivel que ha alcanzado el movimiento de AA, según el grado de disponibilidad, políticas, restricciones y posibilidad de reutilización inmediata beneficia tanto a sus editores como a los autores. El objetivo de este estudio fue caracterizar cuan abiertas

son las revistas de ciencias de la salud del Arco Insular del Caribe. Método: El diseño del estudio fue una investigación mixta con diseño exploratorio. La parte cualitativa consistió en un análisis de contenido de fuentes de información secundaria para identificar las revistas, y un análisis de solapamientos. En la parte cuantitativa se aplicaron puntuaciones de los indicadores de los criterios del Espectro del Acceso Abierto a 78 revistas de Cuba, Jamaica, Puerto Rico, República Dominicana y Trinidad y Tobago con una base de datos. Resultados: Se encontró que más de la mitad de estas revistas no tienen barreras económicas, legales o técnicas que condicionen o limiten el acceso abierto. También, encontró que los criterios que necesitan fortalecerse más en las revistas relacionadas a la salud en el Arco Insular del Caribe están relacionados con las políticas sobre derechos de autor y derechos de publicación de los autores. Conclusiones: Hay áreas que deben fortalecerse si se desea mayor apertura del acceso abierto. Se debe prestar mayor atención a los derechos legales en los cuales el derecho de autor y el derecho a publicar de autor en repositorios o páginas personales no está declarado de manera explícita para beneficio de los autores. También, poco más de una tercera parte de las revistas estudiadas se encuentra en vías de desarrollar prácticas más abiertas.

## 043

### Memoradum of Understanding (MOU): A Voluntary and Nonbinding Mode of Today's Research

*Reydi Morales-Martínez, Víctor Emanuel Reyes-Ortiz, Carlos Cabrera-Bonet, PR CoNCRA*

An MOU is a bilateral or multilateral agreement between parties. It forms a common goal indicating the intention to have a standard course of action. Nevertheless, MOU's need to be surrounded by evaluation methods timely measuring specific outcomes that are objective and relevant to the population's health. This research shows the evolution of MOU's and different adaptations needed to satisfy multilateral partners working together with a CBO in San Juan, P.R. Our research was based on an adaptation of the PAHO document entitled: "Utilización de Desiciones Regulatorias de Otras Jurisdicciones", issued at the IX Conferencia Panamericana para la Armonización de la Reglamentación Farmacéutica. As a result of our observations and the implementation of our findings, managers of CBO's have reduced duplication of efforts, improved efficiency and efficacy, and strengthened regulatory capabilities for our partners and us. Similarly, managers have reduced the administrative burden related to data collection, storage and ownership, helping maintain supply chain integrity for clinical services. In conclusion, MOU's help inter agency communication, encourage the adoption of sound regulatory practices and encourage the development of collaborative activities between participants when properly aligned to the parties' goals.

## 044

### It Is Always Better for Business to Know the Cost – An Exploratory Finance Study for Determining Patient Cost per Year

*Antonio Delgado-Rosado, Gladys Rodriguez-Maldonado, Carlos Cabrera-Bonet, Victor Emanuel Reyes-Ortiz, PR-CoNCRA*

Life expectancy has increased in the past decade and aging is far from being an illness but a normal process among humankind. Therefore, as life expectancy and aging increase also the cost of long-term disease acquired through the spectrum of life such as HIV. The objective of this systematic exploration is to find the challenges that comes at the time of calculating COI (Cost of Illness) in a patient receiving services for HIV at a CBO in Puerto Rico beyond the HIV testing services which are an important component. A simulation took place with a standardized-patient who navigated the process within the CBO making a flow diagram of the process from diagnosis to all other basic services offered by the CBO. Thereafter an evaluation of the accountable services by area were taking into consideration. Our findings revealed that among the barriers in the process of determining a COI the following were of more relevant to the organization: a) decentralization and segregation of data related to billing process was frequently found b) a low specificity in billing system that allow to attribute money to the COI. Although it's always better to

know the cost of a service as a better practice in health administration and financial strategies there are gaps in the correct determination of patient cost per year that are currently being addressed to accurately establish COI by patient by year.

## POSTER PRESENTATIONS

### 045

### La emigración del país: ¿A quiénes Puerto Rico está perdiendo?

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Introducción/Objetivos: El siglo XXI ha marcado una pauta de pérdida de población en Puerto Rico nunca experimentada. Una disminución en los nacimientos nos ha llevado al decrecimiento. A esto se añade una emigración considerable hacia los EE. UU. de nuestros habitantes. Debemos preguntarnos, ¿a quienes perdemos con la emigración? Es importante el conocer las características de quienes emigran. El objetivo del estudio fue analizar la cifra de emigrantes de puertorriqueños hacia los Estados Unidos y sus características sociodemográficas. Metodología: La fuente de datos utilizada fue la Encuesta de la Comunidad de Puerto Rico, año 2022. El análisis realizado fue transversal descriptivo. Se enfoca en la población que reside en los EE. UU. que hace un año vivía en PR. Hallazgos: Para el 2022 se movieron 42,990 personas de P.R. a EE. UU. De estas, el grupo de 20 a 29 años con 12,991 (30%) fue el más grande. La edad media es 30.3. Aproximadamente la misma cantidad de hombres y mujeres (21,532 vs 21,458). La inmensa mayoría había nacido en P.R. o EE. UU. (89%). Un 30% tenía un nivel de educación de bachillerato o más alto. La mayoría eran nunca casados (84%). El ingreso mediano fue de $18,038 y cerca del 30% estaban bajo el nivel de pobreza. Conclusión: La pérdida de recursos humanos en P.R., es un asunto demográfico crítico, preocupa el talento que perdemos cuando se necesita habitantes en edades productivas y reproductivas. Los emigrantes se distinguen por ser adultos jóvenes, con gran proporción de personas con alto nivel de educación, y que participaban en la fuerza laboral. La pérdida de esta población acelera el envejecimiento de la población. Esto requiere atención urgente con políticas dirigidas a que nuestro talento permanezca en el país y atraiga a la población joven.

### 046

### Enrichment Analyses of Genes Harboring Rare de novo Variants in ADHD

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Introduction: ADHD is a prevalent childhood neurodevelopmental condition that exerts considerable challenges on individuals. Identifying genes related to ADHD is crucial for advancing our knowledge of the underlying biological mechanisms involved. Examination of de novo variants has led to the discovery of 100s of risk genes in other developmental disorders. Recent research found an increased burden of rare de novo variants in ADHD compared to unaffected controls. This project focused on examining how these de novo mutations may provide biological insights into ADHD. Methods: An IRB-approved literature review was done to identify rare de novo (gnomAD or ExAC frequency <0.00005) potentially damaging variants in ADHD parent-child trios. Using a list of genes with rare de novo variants, conducted biological and molecular pathway analysis with g:Profiler. Web-based Cell-type-Specific Enrichment Analysis of Genes was used to gain insight into the context-specific expression of these genes in human tissue cell types. Results: 42 rare de novo potentially damaging variants were identified and enriched for pathways involving neural projection and ectoderm differentiation. These damaging de novo variants may be involved in developing the neuropeptide S receptor, purkinje neurons, and inhibitory neurons, thus impacting brain structures such as the

cerebrum and cerebellum in the fetal organ system. Conclusion: Rare de novo potentially damaging variants in ADHD may impact early nervous system development. Future directions include collecting and sequencing additional ADHD parent-child trios to identify risk genes and biologic pathways and mechanistic studies examining the role of risk genes on neurodevelopment. Funding: This work was supported by the DICE Summer Research Program and Novartis.

## 047

### Use of recombinant human bone morphogenetic protein-2 after anterior cervical corpectomy and fusion for the treatment of vertebral osteomyelitis

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Introduction:Vertebral osteomyelitis (VO), the most common vertebral infection, can involve any part of the spine, but most cases occur in the lumbar and thoracic areas. Hence, surgical treatment for VO in the cervical spine is less frequent and remains a challenge. Recombinant human bone morphogenetic protein-2 (rhBMP-2) is an osteogenic growth factor that has shown clinical potential as an osteoinductive agent. However, data that supports rhBMP-2 use for cervical osteomyelitis patients after an anterior cervical corpectomy and fusion (ACCF) is limited and consists of minimal cases included in retrospective studies. Ultimately, there is a rising need to improve fusion rates in ACCFs to decrease reoperations in VO patients. Methods: A retrospective review of electronic medical records of 26 adult patients who underwent ACCF for cervical osteomyelitis using rhBMP-2 at the University of Puerto Rico University District Hospital was performed. Indication, preoperative laboratory results, levels of corpectomy, preoperative ASIA score, complications, fusion evaluation at 12 months, and ASIA score at 12 months was reviewed. IRB Approved: A5420122, Date: 3/25/2022. Results: For the cohort of patients, mean age was 47±13 years and 65% were male. Spinal deformity was present in 54%. The levels of corpectomy were: one-level in 2 cases, two-level in 15 cases, three-level in 8 cases and five-level in 1 case. 4 patients had complications and of these, 2 experienced dysphagia. The fusion rate was 100% and no reoperations were performed. An improvement in ASIA score was seen for 54% patients at 12 months follow up. Conclusions: This study demonstrates a fusion rate of 100% with no reoperations or significant complications reported. rhBMP-2 can be considered a feasible and safe grafting material for ACCF procedures in VO patients.

## 048

### *Fasciola hepatica* recombinant FABP-Fh15, downregulates inflammatory cytokines while promoting survival in a mouse septic shock model

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Background & Objective: Parasitic helminths and their derived molecules, possess an inherent anti-inflammatory capacity and therefore a potential therapeutic effect on inflammatory diseases. *Fasciola hepatica*, a parasitic helminth, can dampen phagocytic activity, influence cell recruitment, and induce the production of alternatively activated macrophages. Our objective is to harness the potential of Fh15 as a promising candidate for developing novel anti-inflammatory drugs against sepsis. We hypothesize that intraperitoneal (i.p.) injections of Fh15 will increase the survival rate in mice exposed to lethal doses of LPS, by suppressing the cytokine storm. Methods: To test this hypothesis, we established a septic shock mouse model. Female BALB/c mice were allotted into six groups of 10 animals each. Experimental groups received an i.p. injection of 12 mg/kg body weight of LPS-*E. coli*, followed by an i.p. injection of 50, 100, or 200 µg of Fh15 one

hour later. Control groups received i.p. injections of LPS, Fh15, or PBS alone. Animals were monitored for mortality for 72 hours. Blood samples were collected at baseline, just before animals succumbs to the septic shock or at 72 hours in those that survive to the challenge. Approved by UPR- MSC IACUC, protocol 787219. Date: 7/1/2020. Results: As expected, all animals in the LPS-control group succumbed between 12 to 24 hours after the LPS injection. In contrast, treatment with Fh15 resulted in a notable increase in the survival rate, ranging from 40% to 100% and these results were dose-dependent. The optimized Fh15 dose that maximized the survival seems to be 100ug. This increase was associated to a significant reduction in the production of pro-inflammatory cytokines, such as IL-12, TNF-α, and IFN-γ, which were measured in the serum using Bioplex. Conclusion: These findings suggest that is an excellent Fh15 biotherapeutic drug to suppress the lethal consequence of septic shock and suppress the cytokine storm in the mouse model. Acknowledgments: This work was supported by NIAID/NIH grant number SC1AI155439-01, NIGMS-RISE Program grant number R25GM061838 and The AAI Careers in Immunology Fellowship Program for my salary support.

## 049

### Prevalence of *Psoas minor* muscle using cadaveric specimens in the Caribbean population

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The *Psoas minor* muscle (PMM), is a thin muscle located in the posterior abdominopelvic region, anterior to the psoas major. It typically originates in the T12 and L1 vertebrae and converges distally with the Psoas major and Iliacus fascia to insert on the iliopectineal eminence. Functionally, it participates in flexion and sideways tilting of the lumbar spine, stabilizing the hip joint. The PMM is a vestigial muscle, meaning it is not present in the entire population. The degree of presence and its morphology have also been linked to ethnicity. However, the available data principally is in Europe and no studies concerning these aspects of the PMM have been conducted in the Caribbean. Objective: to elucidate the prevalence of the PMM within this population and explore its anatomical variations. Methods: We conducted a pilot study on 18 human cadavers to examine the PMM, including gender analysis, by performing cadaveric dissections. We measured the muscle's insertion tendon longitude, insertion tendon width at its midpoint, and the musculotendinous junction, muscle belly longitude, and muscle belly width at its midpoint. We took three measurements for each parameter and calculated the average for t-test analysis. IRB Approved: 2401180818. Date: 1/23/2024. Results: Preliminary data suggests that the PMM is present in 66.67% of cadavers, with unilateral and bilateral presence in 16.67% and 50% respectively. Analyses of anatomical relationships indicate no significant gender-based differences in the above parameters ($p>0.05$). Conclusions: More samples will be evaluated to provide comprehensive data for the broader field of anatomical research and education. The outcomes of this study will potentially provide useful data for the treatment of syndromes that implicate the psoas minor or psoas compartment syndrome. Acknowledgment: There is no conflict of interest in this study.

## 050

### Factors related to the use of emergency medical services and its effect on reperfusion procedures and in-hospital outcomes among heart attack patients

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Background and Objectives: Cardiovascular diseases (CVD) are the leading cause of death in the world, including Puerto Rico. Risk factors are higher when compared with the United States, and disparities exists in the prevalence of coronary diseases and heart attacks. Promoting early recognition of heart attack symptoms, activation of Emergency Medical Services (EMS) though 911 calls, and access to reperfusion therapies are key to decrease subsequent morbidity and mortality. This study aimed to identify factors related with EMS use and its effect on reperfusion invasive procedures and in-hospital outcomes among heart attack patients from a sample of the Puerto Rico Cardiovascular Surveillance Study (PRCSS) years 2007, 2009 and 2011. Methods: This study is a secondary analysis following a cross-sectional design. The sample included 3,627 heart attack patients from 19 participating hospitals. Univariate, bivariate, and multivariate statistical analyses were conducted. This project was approved by the Institutional Review Board (IRB) of the University of Puerto Rico Medical Science Campus (UPR-RCM). IRB protocol number: A3420122. Approval date: 11/10/2022, Results: Forty-one (41.5) percent of heart attack patients used EMS to arrive at a hospital. Factors significantly associated with EMS use included being older, having a history of smoking, being diagnosed with STEMI, and arriving at a hospital from another hospital. Lower EMS use was associated with Medicare or private health insurance, and chest pain and dyspnea as onset symptoms. Those who used EMS received less reperfusion procedures, but were more likely to present complications, have a longer length of stay, and die in the hospital ($p<0.01$ in all tests). Conclusion: Findings may inform strategies to improve stakeholders' integration, develop future public educational interventions, guide resources allocation and strengthen delivery system's capacity, establish standardized protocols to respond to potential and/or diagnosed heart attacks, and evaluate performance and outcomes; all of which can improve EMS and subsequently population health. Acknowledgements: This project is supported by the Endowed Health Services Research Center (EHSRC), University of Puerto Rico School of Medicine (UPRSoM), through Award Number Grants 5S21MD000242 and 5S21MD000138 from the National Center for Minority Health and Health Disparities, National Institutes of Health (NCMHD-NIH).

## 051

## Disparities in cervical cancer among LHS+ women: A primer for medical students

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Background and Objectives: Latina, Latino, Latinx, Latine, Hispanic, or of Spanish Origin+ (LHS+) women have higher risk of cervical cancer incidence and mortality compared to Non-Hispanic White (NHW) women. Disparities are attributed to socioeconomic factors, limited access to healthcare, language and cultural barriers, and negative healthcare experiences. Over 30% of LHS+ women have reported that their health concerns and symptoms were not taken seriously by providers. This project aimed to educate medical students and faculty on cervical cancer disparities among LHS+ women, as well as culturally competent communication strategies to address barriers and promote prevention. Methods: The six-step Kern model was used to develop, implement and assess a 60-minute workshop which included a PowerPoint presentation, video and case discussions. Pre and post-test were developed using Kirkpatrick's evaluation model. This project was approved by the Institutional Review Board (IRB) of Universidad Central del Caribe (UCC) protocol number 2023-10. Results: The workshop was implemented four times, in-person and virtually, to medical students, faculty,

and staff from LCME-accredited medical schools. A comparison of pre and post-tests responses (n=39), through the Related-Samples Wilcoxon Signed Rank Test, showed a statistically significant increase in confidence in achieving each learning objective. They rated the workshop as very good or excellent, and their feedback highlighted the value of incorporating interactive and engaging activities such as video and case discussions. Conclusion: Increasing providers' awareness and knowledge about cervical cancer disparities in LHS+ women will improve the care, quality, experience, and health outcomes of LHS+ community. Future educational workshops should consider culturally nuanced materials for different Spanish-speaking nationalities (e.g. Dominican, Mexican, etc.), medical Spanish training materials for practitioners, and cervical cancer trainings for LHS+ women who also identify as a part of the LGBTQ+ community. Acknowledgements: This project was supported by the National Board of Medical Examiners (NBME), the Academic Medicine Writing Fellowship of Building the Next Generation of Academic Physicians (BNGAP) Inc., and the Latino Medical Student Association (LMSA) Inc.

## 052

### Characterization of the Patient Population in the Padre Venard Student-Run Free Clinic in San Juan, Puerto Rico

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Background: *Clínicas Padre Venard* is a student-led free clinic that has provided healthcare to the underserved, uninsured, and houseless since 1999. We offer health education, preventive screenings, and essential provisions, including hygiene supplies, clothing, and food. Given the limited information available about the underserved and uninsured urban population of Puerto Rico, our objective is to comprehensively characterize our patient population. By understanding our community's specific healthcare needs we can develop tailored strategies and ultimately enhance health outcomes. Methods: We employed a retrospective record review with data since 2018. This involved the examination of deidentified patient records, extracting information on sex, chief complaints, past medical history, social histories, and number of clinic visits. Results: 145 records were scanned, representing a population with a mean age of 55 years. The majority (84%) of participants were male. Since 2018, there have been a total of 342 clinic visits. Whilst a high number of patients came for a routine visit (43%), the predominant chief complaint was related to the musculoskeletal system followed by the dermatological system. The most common chronic diseases included hypertension (17%), diabetes (11%), mental health disorders (10%), and asthma (5%). 10% of patients came to the clinic with lacerations, wounds, and/or burns. The social history of our population, of those who chose to answer (N=85), showed a prevalence of smoking (55%) drinking (49%), and drug usage (29%). Conclusion: This study presents the initial insights into the population of our community clinic and as a foundation for a more personalized and comprehensive approach. We plan to implement a questionnaire to gather more personalized information with a focus on social determinants of health. Additionally, we aim to establish a follow-up department to develop continuity of care and enhance patient outcomes based on the identified necessities.

## 053

### Polysaccharide peptide overexpresses the HIV-1 restrictive factor PKR and upregulates immune-boosting components in Jurkat T-cells.

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Purpose: Despite the advancements on anti-retroviral therapies, HIV-1 continues to be a threat on the adaptive immunity. Among these, CD4+ T-helpers

represents the most significant contributors of our immune system. They ensure long-lasting immunological memory and ability to ward-off infections. Our recent findings demonstrated that Polysaccharide peptide (PSP) extracted from the mushroom *Coriolus versicolor* induces potent anti-HIV-1 effects. Specifically, PSP treatment significant impacts viral entry in the innate immunity through the pre-production of interferon-induced protein (IFN-IP) Protein Kinase-R (PKR) under a Toll-like Receptor 4 (TLR4) response. The current study sought to determine the anti-HIV roles of PSP in the adaptive immunity. The latest pre-liminary data has revealed the up-regulation of: TLR4, Nuclear Factor Kappa B (NF-kB), and PKR with no cytotoxicity in PSP treatment. Based on these new data, we hypothesized that PSP activates the transcription of interferons (IFN) under TLR4 signaling in T-cells. This would lead to force activation into T-helper targeting HIV-1 for destruction. The outcome of this research will give insight towards the PSP inhibitory effects in the adaptive immunity. Methods: PSP anti-HIV role was evaluated using Jurkat T-cells treated with 50µg-1,000µg during a 3-day-period. Viral load gathered from collaborators and Laboratorio Borinquen were performed to assess total HIV-1 with/without PSP using PKR inhibitors for innate immunity. Immunoblots were performed for: PKR, TLR4 and NF-κB in Jurkat T-cells. MTT-viability were implemented to understand PSP cytotoxicity in Jurkat T-cells. Results: Viral load resulted an average of 73% and 11% (PKR blocker) PSP-induced restriction in innate immunity. Immunoblotting revealed the overexpression of PKR, TLR4 and NF-κB in PSP-treated Jurkat T-cells. MTT revealed no PSP-cytotoxicity in Jurkat T-cells. Conclusion: The data gathered in this research demonstrates the first findings of PSP extending its immune boosting capabilities towards the adaptive immunity. Acknowledgements: The project described was supported by the UCC Pilot Project Program grant. The principal investigator (PI) of this research would also like to express heartfelt gratitude to Dr. Franceschini and Laboratorio Borinquen for their continuous support and aid with the viral load facilities. The PI also would like to thank Dr. Boukli as well as Dr. Franceschini for providing access to the UCC HURRA laboratories during this transitional period. Lastly but not least important, the PI thanks Dr. Diana Fernandez, associate dean of research and graduate studies and the chairwoman of the department of Microbiology and Immunology, associate dean of school of medicine, Zilka Ríos, for their constant support and assistance of this project.

**054**

## Sources of Caregivers' Discomfort or Annoyance When Facing Diagnosis and Treatment of Type 1 Diabetes in their Hispanic Adolescent Offspring

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Background/Objective: Most caregivers of children with type 1 diabetes (T1D) suffer intense discomfort at diagnosis and when facing its treatment complexities. However, the content of such discomfort has not been explored in depth among Hispanic caregivers. We examined the specific content of caregivers' discomfort/annoyance about T1D in their offspring and the relationship between the most common annoyance sources and diabetes-related variables. Methods: Participants were 65 Hispanic caregivers (81.54% women) aged 32–58 (*M*=43.34) who completed eligibility assessments for an adolescent depression treatment study (IRB-approved). Caregivers answered an open-ended question about things that had bothered/annoyed them most about T1D in their children (aged 12-17 years) since diagnosis. We identified the main themes of parental annoyance and coded responses using categories defined based on their content. We used Chi-square tests, Welch ANOVA ($p \leq .05$), and Pearson correlation (one-tailed) to assess associations between reports of most common themes and diabetes-related criteria. Results: Caregivers' responses produced 83 codable units. Agreement between two coders was excellent ($\kappa = .97$). Sources of parental discomfort and their

occurrence were: "Social or Structural Barriers" (SSB; 35.23%), "Self-Care Issues" (21.69%), "Impact on the Family" (IOF; 22.89%), "Youth's Cognitive/Emotional Aspects" (8.43%), and "No Discomfort/Recall of Discomfort" (14.46%). The proportion of caregivers' responses coded within these categories was 33.85%, 27.69%, 27.69%, 10.77%, and 18.46%, respectively. Compared to their counterparts, a higher proportion of caregivers annoyed by SSB had children who were non-compliant with insulin care (previous 3 months). Caregivers bothered with diabetes IOF had offspring with significantly lower scores on family support with insulin care. Coding within this category was associated with more severe adolescents' worries about T1D. Conclusion: Our findings suggest that parental interventions should include strategies to address caregivers' most common sources of annoyance about T1D in their offspring, and examine the relationship between these sources, diabetes self-care, and diabetes-related family support. Acknowledgements: This study was supported by the National Institute of Diabetes and Digestive and Kidney Diseases (R03DK092547). Work on this study was also possible thanks to Institutional Funds for Research granted to the second and fourth authors by the Deanship of Graduate Studies and Research of the University of Puerto Rico, Río Piedras Campus.

## 055

### The role of Tip60, a histone acetyltransferase, on alcohol-induced seizure susceptibility in Drosophila

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Background and Objectives: Epilepsy is a neurological disorder characterized by recurrent episodes of seizures due to altered electrical signals between neurons. Moreover, alcohol consumption is known to produce seizure-inducing adaptations as a symptom of withdrawal. While some medications are available to alleviate the symptoms of epilepsy, alcohol consumption can affect the release of anti- epileptic drugs (AEDs) into the bloodstream. To comprehend the mechanisms underlying the effect alcohol consumption has on seizure susceptibility, we implemented a *Drosophila melanogaster* model given that approximately 60% of the fly's genes are homologous to those in humans, with 75% of these responsible for human diseases such as epilepsy. We aim to determine the role of Tip60, a histone acetyltransferase that has been previously linked to alcohol neuroadaptations, in the mechanisms previously mentioned after alcohol exposure. Methods: To achieve this, we used the UAS-Gal4 genetic manipulation system and RNAi against Tip60 to knock down Tip60 expression in the brain (elav- Gal4/UAS-Tip60-RNAi). To delve into the effects of alcohol consumption, the number of days of alcohol exposure varied in the four groups that were used for both the experimental and the control flies. Nonetheless, each group of flies was exposed to 0.5mL of 95% EtOH for 40 minutes at a time. After 24 hours of the final exposure, the flies were subjected to mechanical stimulation to induce convulsions. Results: Our preliminary results obtained from recordings of the flies' seizure-like behavior show that the control groups had an increase in seizure susceptibility following mechanical stimulation when exposed to alcohol. Furthermore, the experimental group whose Tip60 expression is knocked down, presented an even higher susceptibility to seizures when exposed to alcohol. Conclusions: These results demonstrate a direct link between a knockdown in Tip60 expression and an increase in seizure susceptibility, providing the foundations for future interventions in the treatment of alcohol-induced seizure susceptibility. Acknowledgment: This research was supported by NIH Grant 5P20GM103642, NIH 5R25GM061151-19, NSF Grant 1736026, NIH Grant 2R25NS080687, NIH Grant P20GM103475, NSF Grant 1633184 and NSF Grant 2131647.

## 056

### Unusual Reaction to *Candida albicans* Antigen in the Treatment of Common Warts

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Background and Objectives: Warts are a common dermatologic problem caused by the Human Papilloma Virus (HPV). Managing this skin infection can be frustrating for both patients and physicians due to the painful therapeutic modalities and high recurrence rates. In recent years, the use of immunotherapy has gained popularity as a novel treatment, despite not being FDA-approved. Immunotherapy utilizing the Candida albicans antigen aims to harness the Adaptive Immune System's ability to induce a Delayed-Type (Type IV) Hypersensitivity Reaction, a cell-mediated response, against wart tissue for eradication. While existing literature mentions adverse effects on hand digits, we present a case of an adverse reaction on the dorsum left foot in a 54-year-old female patient with multiple small verrucous papules and plaques after her second and third dose of CA antigen. Methods and Results: After the second dose of Candida albicans antigen, the patient experienced adverse side effects diagnosed as Cellulitis, which resolved with antibiotics. However, after the third dose, adverse effects were noted on the dorsum left foot. Fortunately, these effects resolved 3-4 days later without complications, but unfortunately, the warts did not resolve. This case highlights a unique manifestation of adverse reactions to the immunotherapeutic agent in a specific anatomical location. Conclusion: Dermatologists should be vigilant regarding aberrant side effects associated with the use of the Candida albicans antigen in immunotherapy. Adequate orientation is crucial, and obtaining informed consent should consider potential unusual reactions, especially in non-typical areas like the dorsum left foot. It is essential to report such cases to contribute to the understanding of adverse effects. The need for controlled clinical trials is emphasized to standardize doses and systematically document side effects in terms of frequency and severity. This approach will enhance the safety and efficacy of immunotherapy for wart treatment. Acknowledgments: None.

**057**

## Perinatal Mental Health and Coping Mechanisms during the COVID-19 Pandemic in Puerto Rico

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Introduction: The COVID-19 pandemic was associated with elevated levels of anxiety and depression in pregnant women around the globe, including Puerto Rico. However, it has been found that certain coping mechanisms can be a protective factor for their development. A study conducted in Puerto Rico reported that this population experienced higher stress levels related to the burden of the pandemic. Therefore, it is relevant to determine what is the mental health state of this cohort (n=46) after the initial stressor of the pandemic and compare how their symptoms and coping mechanisms have changed during (T1) and after pandemic social distancing (T2). Methods: Data for both periods were gathered from the Center for the Study of Fear and Anxiety COPE-I & COPE-II studies, screening for depression (PHQ-9), anxiety (GAD-7) and the COVID-19 Perinatal Experiences Survey (COPE: IS). During T2, a follow-up survey was performed (COPE: IU. A paired T-test was performed to determine differences between the mean scores of the screening tests. Categorized qualitative data were used to compare the coping mechanisms employed during T1 and T2 (sleep, mindfulness, socializing, exercise, and social media use). The aforementioned methods were approved by the IRB. Results: There was an increase in symptoms of anxiety and depression scores in the sample, from 13% to 22% and 8.6% to 26%, respectively. The mean for GAD-7 scores was T1=5.53 & T2=6.67 ($p<0.05$). For PHQ-9, T1=5.15 & T2=6.35 ($p<0.05$). Regarding coping mechanisms, an increased frequency was observed among most variables, especially getting better sleep. However, there was a slight decrease in socializing. Conclusion: Increased prevalence of anxiety and depression after the pandemic, despite increased self-care practices, might indicate that other stressors are influencing mental health in this cohort. Subsequent studies could help clarify which factors are contributing to this tendency.

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## 058

### Perfil sociodemográfico de la población de 60 años o más en Puerto Rico: 2018-2022

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Trasfondo: En los últimos años se ha acelerado el envejecimiento de la población en Puerto Rico, como quedó confirmado en el último censo de población llevado a cabo en 2020. La proporción de personas de 60 años más (28.9%) supera la de los menores de 15 años (13.6%). No se espera una tendencia adversa en los próximos años. Objetivos: El propósito de este trabajo es describir y comparar las características sociodemográficas y de salud de esta población según las distintas áreas geográficas. Método: Para esta investigación, de carácter descriptivo, se utilizó el archivo quinquenal de la Encuesta de la Comunidad de Puerto Rico (PUMS) del 2018-2022 que provee el Censo de Población y Vivienda para Puerto Rico. La base de datos se trabajó con el paquete estadístico SPSS (Statistical Package for the Social Science). Se consideraron variables sociodemográficas, las relacionadas con el individuo (sexo, estado conyugal…), y las que tienen que ver con la vivienda y la familia (jefatura, propiedad…) de los adultos mayores en Puerto Rico. Estos datos fueron agrupados en seis áreas geográficas determinadas. Resultados: Son más las mujeres envejecidas que los hombres (56.19%). El área metropolitana cuenta con la proporción mayor de estas mujeres. El 30.37% de la población de la región oeste lo componen personas mayores de 60 años. Los viudos se concentran al norte (21.39%). En el oeste se agrupan las personas bajo pobreza (46.34%). De los adultos mayores que viven en el sur, 51.13% presenta al menos una discapacidad. Conclusión: La población de adultos mayores en Puerto Rico es diversa en su totalidad y por región geográfica. El estudio de las características sociodemográficas debe servir de base para los planes estratégicos que busquen atender las necesidades de este grupo poblacional.

## 059

### Severe Crunch-like Tractional Retinal Detachment in a type 1 Diabetes Mellitus Patient After 4 Months of Insulin Pump use: A Case Report

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Purpose: Tight glycemic control with insulin pumps has decreased the onset and progression of diabetic retinopathy (DR) in type 1 Diabetes Mellitus (DM1) patients. However, the Diabetes Control and Complications Trial reported a paradoxical effect of insulin leading to early DR worsening in 13.1% of patients using intensive insulin therapy. Case Presentation: Herein, we present the case of a 34-year-old female patient with a medical history of chronic hypertension and poorly controlled DM1 who developed vitreous hemorrhages and proliferative diabetic retinopathy (PDR) that progressed to severe tractional retinal detachment (TRD) in both eyes 4 months after being transitioned to an insulin pump. Prior to TRD development, her baseline visual acuity was measured to be 20/15 in the right eye, which decreased to 20/60 in subsequent visits. The left eye was unchanged at 20/20. Multiple sessions of panretinal laser photocoagulation were given. Due to TRD progression in the right eye, which could potentially compromise the macula leading to severe vision loss, pars plana vitrectomy (PPV) was performed. Three months after the surgical procedure, visual acuity improved to 20/25 in the right eye and remained 20/20 in the left eye. Conclusion: The novelty of this case is the TRD in this patient which had similar morphology to Crunch syndrome, a severe form of TRD described after intravitreal anti-VEGF therapy, when this patient was never treated with an anti-VEGF agent. Our patient represents a complex case in which multiple factors, such as poorly controlled hypertension and abruptly tight glycemic control after years of chronic hyperglycemia, could be associated with the rapid

worsening of PDR and TRD development. These findings support the idea that tight glycemic control with insulin could trigger an initial worsening of PDR and, in the peculiar case of our patient, resemble morphologically a Crunch syndrome TRD.

## 060

### ArsM Confers Resistance to Arsenic Induced Toxicity in E.coli

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Trasfondo y Objetivos: La hipótesis de esta investigación es que el gen ArsM confiere una resistencia mejorada al arsénico. Este gen codifica una enzima que genera especies metiladas de arsenito (AsIII). Estas especies se oxidan fácilmente a especies de arseniato metilado (AsV), que son menos tóxicas. No está claro si la inserción del gen ArsM en *E. coli* confiere una resistencia mejorada al arsénico en este organismo. Por lo tanto, el objetivo de este estudio fue explorar la eficacia de la resistencia conferida por el gen ArsM a las formas inorgánicas (iAs) de arsénico. Métodos: El estudio empleó un diseño experimental que implicó el cultivo de tres cepas de *E. coli* (K-12, AW3110 y AW3110+ArsM). Durante un periodo de 6 horas, se tomaron muestras cada hora para mediciones espectrofotométricas, y después de 2 horas de crecimiento, las muestras fueron tratadas con arsenato y arsenito, seguido de un cultivo adicional de 4 horas. Adicional se preparó una electroforesis para sustentar estos resultados. Resultados: Los resultados de las curvas de crecimiento y electroforesis mostraron un aumento en el crecimiento en la cepa de *E. coli* que poseía el gen ArsM cuando se trataba con iAs, en comparación con la misma cepa sin el gen. Conclusiones: Al cultivar las tres cepas diferentes expuestas a arsenito (AsIII) o arseniato (AsV), se puede observar que la cepa AW3110, a la cual se le añadió el gen ArsM, muestra una mayor tolerancia al arsénico. El estudio del gen ArsM en *E. coli* nos ayuda a comprender cómo interactúan los microorganismos con el arsénico y proporciona ideas para desarrollar tratamientos para la intoxicación por arsénico. Además, comprender cómo responde el microbioma intestinal al arsénico puede revelar mecanismos de defensa y estrategias para controlar su contaminación. Agradecimientos: Montana State University, MontanaINBRE, Bothner Lab, Universidad De Puerto Rico en Arecibo y The Leadership Alliance.

## 061

### Academic Urology Endowments and Leadership Roles are Disproportionately Held by Male Urologists

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Background and Objectives: Urology has historically been considered a male-dominated specialty. While women have been increasingly entering the field, there is still a long way to go to achieve gender equity within the specialty. In fact, a study published in 2023 reported female urologists composed just 10.9% of the urology workforce. The aim of this study is to evaluate gender differences in academic urology leadership roles by assessing the distribution of endowments and department chairs amongst male and female urologists. Methods: By leveraging the *Accredited Listing of U.S. Urology Residency Programs* published by the AUA from 2021 to 2023, we queried each individual academic urology program via their public website to analyze faculty members with a MD degree. Faculty members were categorized according to their gender, title, and distinguishments. We then analyzed the proportion of leadership positions and professor roles according to gender using descriptive statistics and a Chi-Squared test. Results: A total of 2,429 faculty members from 136 academic urology programs were included in this study. Of these faculty members, only 19.6% were female, compared to the majority of 80.3% identified as male. Out of the 637 full professor positions identified within these academic programs, only 10.52% were occupied by females, compared to 89.1% occupied by males. A total of 135 positions were identified as endowed or professorship distinguishments, with female urologists receiving just 8.15% of these. Finally, only 5.9% of

the department chairs within academic urology are female, further highlighting the disproportionate share of leadership roles and distinguishments occupied by males within academic urology ($p<0.0001$). Conclusion: While female presence in urology has been increasing, female faculty members in academic urology still have proportionally fewer leadership roles and full professor positions compared to their male counterparts. Further analysis is needed to understand what factors are contributing to these differences. Acknowledgments: N/A

## 062

### Hispanic Caregivers' Opinions About Currently Inaccessible Resources They Need for Meeting Type 1 Diabetes Care Goals in their Adolescent Offspring

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Background/Objective: Adolescents with type 1 diabetes (T1D) and their caregivers need many resources to fulfill diabetes treatment demands. Few studies have examined Hispanic parents' input about which resources they currently lack are essential to meet diabetes care goals. We examined caregivers' reports about currently inaccessible resources that could help them meet T1D care goals in their offspring and the relationship between two categories of resources and health-related outcomes. Methods: Participants were 65 Hispanics (81.54% women) aged 32–58 ($M$=43.34) who completed eligibility assessments for an adolescent depression treatment study (IRB-approved). They answered an open-ended question about currently inaccessible resources considered essential to meet diabetes care needs in adolescents (aged 12-17 years). We identified the main themes and coded responses using categories based on their content. We assessed associations between two common themes and health-related criteria with chi-square tests and ANOVAs ($p\leq.05$). Results: Caregivers' responses produced 83 codable units. Inter-rater agreement was excellent ($\kappa$=1.00). Categories of resources and their occurrence were: "Resources for Improving Adherence and Physical Health" (RIAPH; 37.35 %), "Resources for Improving Psychosocial Aspects of Health" (RIPAS; 24.10%), "Enhancing Structural Aspects of Health Services" (ESAHS; 20.48%), "Increased Adolescents' Commitment/Sense of Control" (2.41%), and "Did Not Identify Unmet Needs" (15.66%). The proportion of caregivers with responses coded within these categories was 43.08%, 29.23 %, 24.62%, 3.08%, and 20.00%, respectively. Compared to their counterparts, caregivers who needed RIPAS showed higher parental burden and had children with lower family support, more quality-of-life problems, and more barriers to adherence to diabetes treatment. Parents in need of ESAHS had offspring with lower diabetes self-efficacy, higher helplessness/hopelessness scores, and higher rates of non-compliance with the recommended frequency of glucose testing. Conclusion: Interventions for Hispanic caregivers must include strategies to help them meet T1D care goals in their offspring, including RIPAS, ESAHS, and not only RIAPH. Acknowledgements: This study was supported by the National Institute of Diabetes and Digestive and Kidney Diseases (R03DK092547). Work on this study was also possible thanks to Institutional Funds for Research granted to the second and fourth authors by the Deanship of Graduate Studies and Research of the University of Puerto Rico, Río Piedras Campus.

## 063

### Association Between Body Weight and Liver Size in a Puerto Rican Pediatric Population Sample

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Introduction: A quarter of the pediatric population in Puerto Rico is either overweight or obese, yet little is known about the impact of pediatric obesity on liver size. If left untreated, childhood hepatomegaly can result in serious complications like hepatic encephalopathy, liver failure, widespread infection, and even cancer in adulthood. Current diagnostic tools, including the gold standard for detecting hepatic diseases—biopsy, have limitations such as invasiveness, pain, cost, and risks to patients. This study aims to establish a connection between unhealthy body weight and liver size in a Puerto Rican pediatric population sample using accessible and noninvasive diagnostic—Ultrasonography. Methods: Forty-three (n=43) pediatric patients (7-19 years) were classified according to BMI, calculated using CDC tools. They underwent craniocaudal panoramic view of the right liver lobe (RLL) using a GE portable Logiqe US machine. Craniocaudal RLL length indicated liver size and was classified by severity. Statistical analyses included Shapiro-Wilk test, T-tests, ANOVA, and Post Hoc Tukey HSD, with significance at $p < 0.05$. Measurements followed Riestra et al.'s pediatric sonography protocols. Results: Of 43 pediatric patients, 22 categorized as healthy, and 21 as unhealthy (11 obese and 10 overweight) based on BMI. The unhealthy and healthy group exhibited a mean RLL of 14.12cm and 12.43cm ($p=0.003$), respectively. Within the unhealthy group, overweight patients had a mean RLL of 13.80cm compared to 14.40cm in the obese group. Furthermore, 77% of healthy patients had a normal liver size compared to 43% of unhealthy patients; therefore, 57% of unhealthy patients demonstrated hepatomegaly. Moreover, 50% of overweight and 64% of obese patients showed evidence of hepatomegaly. Conclusions: Results suggest early liver changes related to obesity during child development, evidenced by differences in RLL measurements and hepatomegaly data. Further investigations are needed to understand the potential impact on the development of future hepatic diseases. Acknowledgments – Supported by the US Department of Education: Title V Grant Award # P031S200104.

## 064

## Innovations in Clínicas Padre Venard's Approach to Community Health in Old San Juan

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Background & Objectives: "*Clínicas Padre Venard*" is a student-run clinic in Old San Juan, dedicated to offering free primary health services to the underserved, uninsured, and homeless population since 1999. Bi-weekly, on Wednesdays between 5:00 p.m. to 8:00 p.m., medical students of the "*Universidad Central del Caribe*" convene at "*Parroquia San Francisco de Asis*" where participants are offered medical attention and are provided with basic hygiene necessities, food, and a social environment. Methods: Starting in August 2023, guidelines have been implemented to enhance the educational experience for students and the quality of the services provided by the clinic. Volunteer orientations were incorporated to train new students, enhancing their capabilities to effectively contribute to the clinic's operations. Undergraduate students were recruited to promote the clinics, utilizing both social media platforms and flyers, to raise awareness and ensure patient participation. These students are also able to shadow and develop a mentor-mentee relationship with our medical students. Additionally, collaboration with doctors from different specialties was fostered to enhance the clinic's medical capabilities and provide a broader spectrum of healthcare services. Research initiatives were also added to assess the unique healthcare challenges faced by the homeless community, allowing for targeted and informed interventions. Results: Our methods collectively contributed to the clinic's growth, efficacy, and ability to provide comprehensive healthcare services to the homeless population of Old San Juan. From August to December 2023, we had 8 free clinics, more than 50 patients, over 50 free meals, 85 student volunteers (65 medical and 20 undergraduate), and 8 physicians.

Conclusion: We aim to continue to tailor our services to our patient population, involving the collaboration between social services and incorporating more specialized clinics into our agenda, such as dental, gynaecologic, and orthopaedic, to ensure continuity of healthcare access in our community.

## 065

### Intermittent Cocaine Self-Administration and Passive Infusions Increase Subthreshold Activity in Midbrain Dopaminergic Neurons

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Substance use disorder (SUD) is a chronic brain disease characterized by transitioning from recreational to compulsive drug use. Intermittent Access (IntA) cocaine self-administration is a protocol suggested to simulate human drug consumption due to its patterns of intermittency. IntA has been documented to produce incentive salience, psychomotor sensitization, and a neurochemical sensitization of the mesolimbic dopamine (DA) system by increasing DA release and neuron sensitivity to cocaine. DA neurons of the ventral tegmental area (VTA) display a mixed cation current conductance known as the hyperpolarization-activated cyclic nucleotide current ($I_h$). Neural processes like resting membrane potential and firing frequency modulation are influenced by the $I_h$. Previous results from our laboratory demonstrated that $I_h$ amplitude and membrane capacitance ($C_m$) of VTA DA neurons are significantly reduced after cocaine sensitization. These reductions resulted in increased temporal summation. However, it is unknown how drug self-administration alters the intrinsic properties of DA cells. In this study, we explored if $I_h$, synaptic integration, and $C_m$ alterations are present after cocaine IntA. We hypothesize that a brief period of cocaine IntA enhances VTA DA cells' synaptic integration. Using in-vitro electrophysiology in rat brain slices, we analyzed the effects of cocaine IntA and passive cocaine infusions on synaptic integration. Our results demonstrate that cocaine IntA produces a significant $I_h$ amplitude reduction of a higher magnitude than passive cocaine infusions. Animals in the cocaine IntA and yoke protocol have a significant increase in temporal summation at depolarized and negative potentials. These results suggest that the associative learning of the drug modulates the $I_h$ of VTA DA neurons and that associative learning processes could enhance synaptic integration. Therefore, the neuromodulations undergone in drug association and consumption during the acute stages could precipitate addictive behavior that might be crucial in modulating the responsiveness of VTA DA neurons to depolarizing stimulus. Support: NIH-NIGMS (2SC1GM084854), NCCR (5R25GM061838-15, 2G12-RR003051), NIMHD (8G12-MD007600), RISE (5R25GM061151-18), NSF-PIRE (OISE-1545803) NIGMS-RISE-R25-GM061838, NIGMS-SURE-R16-GM145475 and NEURO-ID (R25NS080687) RISE- 5R25-GM061151-21. Infrastructure support was partly provided by the National Institute on Minority Health and Health Disparities RCMI Grant: 2U54MD007600.

## 066

### Neurothekeoma: Case report of 17-year-old female and review of literature

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Purpose: Rare diseases like neurothekeoma are not always taken into consideration for differential diagnosis, even when the indications arise. The lack of patients presenting this disease is one of the main reasons why it is challenging for the physician to take it into consideration during the diagnosis. The case is presented to increase awareness of this disease, so it can be added to the differential diagnosis when the signs are presented. Case

description: A 17-year-old female presented with a history of several asymptomatic nodules in the left arm. The patient had no significant past medical history. An excisional biopsy was performed. Based on the morphological and immunohistochemistry findings, Pathology determined these were most compatible with myxoid neurothekeoma, focally extending to margin. Grossly, the left forearm mass was a 0.6 x 0.4 x 0.3 cm tan rubbery tissue fragment on the subcutaneous tissue. The patient underwent two further resections. Two months following the first pathology report, the patient returned for the removal of a nodule on the antecubital fossa. The patient is set for further evaluation. Conclusion: Neurothekeoma is a rare benign nerve sheath tumor, rarely seen on infants and children. Nerve sheath myxoma is identified by a greater degree of myxomatous changes, less cellularity with well circumscribed spindle cells in myxoid matrix and multinucleated giant cells. This case report should increase awareness about the rare disease of neurothekeoma, where it should be included in the differential diagnosis of dermal lesions in infancy, children, and young adults. Acknowledgements: None.

## 067

### Unlocking Neurogenesis: Exploring the Interplay of Exercise and Hippocampal Metabolism for Enhanced Spatial Memory in Mice

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Background & Objectives: The hippocampus, a central hub for learning and memory, is notably influenced by exercise, displaying neurogenic capacity by generating new neurons throughout one's lifespan. However, the understanding of factors governing neural stem cells (NSCs) in neurogenesis, particularly the role of metabolism, is still in its early stages. This study aims to delve into the intricate relationship between exercise and hippocampal metabolism, seeking to uncover how this interplay of metabolites enriches the neurobiological foundation, providing valuable insights into exercise-induced cognitive improvement. Methods: 20-week-old male C57BL/6J mice (Jackson Lab) were randomized into sedentary (SED, n=7) and running (RUN, n=7) groups in a study approved by IACUC #A660121. The metabolic extracts obtained from the hippocampus after 8 weeks of running exercise were analyzed via GC/MS, followed by Univariate, Chemometric, and Enrichment analyses. The differences in the spatial memory were evaluated by the Barnes maze. Results: We identified a significant elevation in key metabolites vital to the energy metabolic network within the hippocampus of the RUN group. These encompass oxidative phosphorylation, the tricarboxylic acid cycle, fatty acid metabolism, nitrogen metabolism, and CoA biosynthesis. These processes are indispensable for the generation of new neurons and their integration into existing neuronal circuits in the brain. The observed enhancements in CoA biosynthesis and folate/methionine cycles emphasize heightened epigenetic regulation, a critical factor for neurogenesis. This regulation supplies acetyl groups for histone acetylation and methyl groups for histone methylation, pivotal in gene expression and neuronal differentiation. Notably, the RUN group exhibited a significant improvement in spatial memory compared to the SED group. Conclusions: Our study unveils the impact of running exercise on hippocampal metabolic pathways crucial for neurogenesis and spatial memory enhancement. It highlights the interplay between exercise, metabolism, and brain health, offering insights for therapeutic interventions in memory, learning, and neurodegenerative disorders. Acknowledgment: This research was supported by the NIH/NIGMS-PRINBRE Grant 5P20GM103475.

## 068

### Association of gut bacterial toxins with colorectal neoplasia in Lynch Syndrome patients in Puerto Rico

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Lynch syndrome (LS), caused by germline mutations in DNA mismatch repair pathway genes, increases the risk of colorectal cancer (CRC) and other cancers. Not all LS patients develop CRC and age at diagnosis varies significantly, even among individuals with identical mutations. Environmental factors may impact the composition of the gut microbiota, which could play a role in the development of CRC. Certain strains of gut bacteria harbor pro-inflammatory/genotoxic genes that promote sustained inflammation in the host (*pks*, *tcpc*, *gelE*, *cnf-1*, *usp*, and *murB*). The association between inflammation and carcinogenesis is well established, however, bacteria-induced inflammation and genotoxicity's role in CRC is unclear. This study aims to investigate if changes in the prevalence of these bacterial genes are associated with CRC in LS patients. Stool samples were collected from 32 LS patients and 94 age/gender-matched control subjects without a history of CRC. The presence of these bacterial genes was assessed using RT-PCR with SYBR green. Among LS patients, 68.8% had ≥2 of the six genes in their stool samples, whereas controls had 27.7%. Furthermore, LS patients had 4.06 times the odds of having ≥2 gut bacterial toxin genes in their stool (95% CI: 1.48-11.12) when compared to controls. The most common gene in LS patients was *murB* (62.5%), and *gelE* and *murB* genes were much higher than in controls. Additionally, LS patients had 4.52 times the odds of having the *gel-E* gene (95% CI: 1.69-12.14) compared to controls. Moreover, LS patients without a history of CRC had higher odds of having ≥2 gut bacterial toxin genes in their stool (OR= 2.94, 95%: CI 0.52-16.50) than controls. This study shows that LS patients have a higher prevalence of the genotoxic/pro-inflammatory bacterial genes. However, more research is needed to confirm these relationships and explain how gut bacterial genes affect CRC in LS patients.

**069**

## Prevalencia de Miedo a Caídas en Adultos Mayores Residentes de San Juan, Puerto Rico

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Trasfondo y objetivos: El 65% de los adultos de 65 años o más presentan miedo a caídas. Como consecuencia, muchos cesan el realizar sus actividades del diario vivir, se convierten en personas dependientes, aún teniendo la capacidad de ser funcionales, y aumenta el desarrollo de comorbilidades. Objetivos: (1) Explorar la prevalencia del miedo a caídas en adultos mayores de 65 años y (2) Comparar la prevalencia del miedo a caídas en adultos mayores que realizan actividad física (AF) con los que no realizan. Método: Diseño no experimental, descriptivo y transversal. Se utilizó la escala *Falls Efficacy Scale International* (FES-I), con un Alfa de Cronbach's de 0.92. La muestra de 50 adultos, vive en el Residencial Manuel A. Pérez, edad promedio 72.7 años (DE=7.1), 82% féminas, 52% solteros y 54% sufrieron caídas en los últimos 5 años. Aprobado por el IRB: A7200422. Fecha: 9/6/2022. Resultados: Se identificó una alta prevalencia de miedo a caídas en el 64% de la muestra y moderada en el 22%. El 35% (n=17) de los participantes reportó realizar AF, mientras que el 65% (n=32) no realizaba AF. El 69% de los adultos que reportaron alta preocupación a caídas no realizaban AF, comparado con el 31% que sí realizaba AF (p=0.3). Una alimentación balanceada se asoció con un nivel moderado a bajo de miedo a caídas (p=0.03). El 85% de los sujetos con historial de caídas reportaron un alto nivel de miedo a caídas en comparación con aquellos que no reportaron caídas (p=0.001). Conclusión: El miedo a caídas es un fenómeno real en los adultos mayores puertorriqueños que puede impactar la calidad de vida. Estos resultados permiten guiar investigaciones futuras a explorar la efectividad de intervenciones

como la actividad física y una alimentación balanceada en la prevención y reducción del miedo a caídas en los adultos mayores, y la promoción de un envejecimiento saludable. Agradecimientos: Reconocemos el preciado tiempo separado por los participantes y al equipo de trabajadores públicos del Residencial Manuel A. Pérez que proveyeron el escenario para realizar el estudio.

## 070

### Adaptación Cultural y Fiabilidad de la Escala de Prácticas de Sedación de Enfermería

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Trasfondo y Objetivos: Hasta un 43% de los pacientes en la unidad de cuidado intensivo (UCI) son intubados y sedados, procedimientos que pueden predisponer a resultados negativos. El objetivo de este estudio fue determinar la claridad, calidad de la redacción, comprensión y relevancia a la cultura puertorriqueña de la Escala de Prácticas de Sedación de Enfermería, así como, su validez aparente y fiabilidad interna. Esta escala identifica factores que influyen las prácticas de sedación ejecutadas por los profesionales de la enfermería. Método: Siguiendo el proceso recomendado por Wild y colaboradores (2005), se realizó la traducción del inglés al español de la escala y luego se invitó a participar del estudio a profesionales de enfermería a través de las redes sociales de la Sociedad Puertorriqueña de Cuidado Crítico y del Colegio de Profesionales de la Enfermería de Puerto Rico. Aprobado por el IRB: A5580221. Fecha: 6/25/2021. Resultados: Participaron 42 profesionales con experiencia en UCI en Puerto Rico. El análisis reflejó coeficientes de fiabilidad entre 0.55 y 0.80 en las sub-escalas de actitudes, norma subjetiva, prescripciones y objetivos de sedación y prácticas de sedación. Sin embargo, la sub-escala de control conductual percibido arrojó un valor más bajo de 0.4. De estos profesionales, 28 evaluaron la claridad, calidad de la redacción, comprensión y relevancia a la cultura puertorriqueña de la escala. El 83.1% de ellos reportó buena claridad, 84.1% consideró buena calidad de la redacción y el 83.8% que la comprensión y relevancia a la cultura puertorriqueña fue buena. Conclusión: Esta escala, disponible en español, representa una herramienta para conocer las actitudes, creencias y prácticas de sedación ejecutadas por los profesionales de la enfermería en Puerto Rico. Además, es una oportunidad para determinar la necesidad de intervenciones educativas, de entrenamiento y desarrollo de personal que redunden en cambios en las prácticas de sedación.

## 071

### A Safety and Feasibility Study of the Oral Live Biotherapeutic MRx0518 with Hypofractionated Preoperative Radiation for Resectable Pancreatic Cancer

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Background: Pancreatic ductal adenocarcinoma (PDAC) is the third leading cause of cancer-related deaths in the United States, necessitating innovative therapeutic approaches. Surgical resection, mainly microscopic R0 resection, is the sole curative option, prompting the exploration of neoadjuvant therapy to enhance long-term survival prospects for resectable PDAC patients. Simultaneously, the role of the intestinal microbiota in systemic immune responses has garnered attention, with MRx0518, a strain of commensal Enterococcus gallinarum, exhibiting promising results in preclinical models by stimulating immune responses and displaying anti-tumor activity. This study postulates that enhancing the microbiota with MRx0518 could induce an immunogenic profile that is beneficial in reducing systemic failure and enhancing local control in resectable pancreatic cancer. Methods: Safety and tolerability of MRx0518 in combination with preoperative hypofractionated radiation were assessed in eligible patients diagnosed with resectable PDAC. Patients were administered MRx0518 twice daily, starting one week before initiating chemoradiation with 30Gy in 10 fractions. Patients are to receive MRx0518 up to 24 hours

prior to surgery for tumor resection if eligible. The study's primary endpoint was safety, evaluated by the occurrence of ≥ Grade 3 toxicities defined by CTCAE v5.0 within 30 days post-treatment completion. Results: Of 15 screened patients, 13 eligible individuals were analyzed. Treatment-related adverse events of any grade occurred in 4 patients (30.8%), encompassing fatigue, nausea, diarrhea, and abdominal pain. No patient experienced more than Grade 3 toxicities. At a median follow-up of 14.6 months, median overall survival remained unreached. A total of 7/13 patients underwent surgical resection, achieving a median recurrence-free survival of 19.2 months, all with negative margins. No major pathologic response was observed post-resection. Conclusions: The administration of MRx0518 with hypofractionated neoadjuvant chemoradiation in resectable PDAC demonstrated good tolerability. Further analysis of immune cell infiltrates within resected tumors will elucidate additional associations with changes in the local microbiome.

## 072

### Effectiveness of an Educational Intervention for Low Back Pain and Behavioral Changes in Physical Activity in Oral Health Students and Professors

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Background & Objectives: Dental health professionals (DHPs) are one of many health professionals at risk of developing musculoskeletal disorders (MSDs) due to unusual static postures and repetitive movements while working. The MSDs prevalence among dental professionals is as high as 78%, low back pain (LBP) being one of the most common physical problems which may lead to limitations in movement. Physical activity (PA) has been proposed as a positive solution to reduce the development of work-related MSDs. Studies have shown that most dental professionals and students have low PA levels. This study's aim was to investigate the effects of an educational workshop on the behaviors regarding exercise, PA levels, and the perception and frequency of pain, and to evaluate the effectiveness of the workshop. Method: The sample consisted of 49 subjects from the School of Dental Medicine (DM). A total of seven workshops were conducted, participants were invited to complete one workshop consisting of a presentation, an exercise program, an educational competition and 4 surveys. A follow-up survey was sent via email 7-days and 3-months after the workshop date attended. This research was approved by the UPR-RCM IRB board, protocol num. B1470322. Results: The participants consisted of 69.4% DM students, 16.3% DM residents, and 14.4% professors. LBP was reported by 12.2% to 26.5% and the average level of pain was 3.31 to 4.8. A high percentage of the subjects reported high PA levels before the workshop, at 7-days the majority were moderately active, and by 3-months the responses were spread out. It was observed that PA was associated with stage of change at 3-months ($p$ = 0.01, $p$ < 0.05). According to the satisfaction questionnaire, all the subjects indicated to be satisfied with the workshop. Conclusion: An educational intervention with health-related topics is welcomed by DHPs, yet it's not effective to change their behavior regarding PA, lowering LBP and increasing PA levels. Acknowledgements: We extend our gratitude to the Physical Therapy Program ex-alumnae's, class of 2024 and professors, and the School of Dental Medicine and the Expanded Functions Dental Assisting Program from the School of Health Professions administrative who collaborated in our study.

## 073

### Characterization of insulin-like growth factor system components in echinoderms during intestinal regeneration.

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Introduction: Insulin and insulin-related peptides such as Insulin-like Growth Factors (IGFs) are crucial in different biological processes including growth, cell differentiation and metabolism. Other important genes associated with the IGF system are the IGF-binding protein (IGFBP), the Acid Labile Subunit (IGFBP-ALS) and the IGF receptor (IGFR).

The first two form a trimeric complex with the IGF and are involved in the regulation, transportation and stability of the peptide. Despite their significance, the understanding of the IGF system and its involvement in regeneration remains limited. Methods: In the present study, we have characterized the components of the IGF system in the echinoderm *Holothuria glaberrima* (sea cucumber), a marine organism known for its ability to regenerate lost body parts. We have then determined their expression profile during the process of intestinal regeneration. Bioinformatic analyses identified orthologs of IGF, IGFBP, IGFBP-ALS and IGFR in the *H.glaberrima* transcriptome, revealing that these genes are present in the holothurian digestive tract. Results: HgIGF, HgIGFBP and HgIGFR show 46%, 53% and 63% similarity, respectively, when compared to the orthologs found in the sea urchin *Strongylocentrotus purpuratus*. We have also determined their expression profiles during intestinal regeneration. Surprisingly, each gene exhibited a distinct expression pattern. While IGF was upregulated during the first three weeks of regeneration, IGFBP-ALS was downregulated and IGFBP showed initial downregulation followed by over-expression in more advanced stages. Interestingly, the expression of the IGFR remained unchanged during the initial stages of the regeneration process. Conclusion: This study provides valuable insight into the presence and dynamics of the IGF system's molecular mechanisms in echinoderms and paves the way for future studies on its role in the regenerative process. Acknowledgements: We gratefully acknowledge support from the Neurograd program from the University of Puerto Rico- Río Piedras Campus (1R25NS127776-01), and from the National Institutes of Health (NIH), NIH-R15 1R15GM124595.

**074**

## Gantzer Muscle Variation of the Flexor Pollicis Longus: An Anatomical Study in Hispanic-Caribbean Specimens

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Background and Objectives: The Gantzer muscle (GM) is an anatomical variation of the flexor pollicis longus (FPL) muscle. This variation has been described in different populations as an accessory head of the FPL muscle in the proximal forearm. Until now, this muscle has been correlated with Kiloh-Nevin Syndrome (KNS), also known as the Anterior Interosseous Nerve Syndrome (AINS). The KNS is a rare entrapment of the median nerve, with distinct recurrent muscle edema of the forearm. Methods: During a routinary dissection, we had an incidental finding of the GM in the Human Gross Anatomy Laboratory of the School of Medicine of the UPR. IRB Approved: 2401178345. Results: Among the 31 specimens in the laboratory, all part of the Hispanic-Caribbean population, the GM was found in 38.7% specimens in 87.5% forearms. Of these 12 specimens, 66.6% were males and 33.3% were females. Leading us to find a higher incidence among males as described in the literature. It originated from the flexor digitorum superficialis (FDS) muscle in 50% of the cases and from the FDS tendon and the medial epicondyle in others. Its insertion was to the FPL tendon in 90.9% and into the flexor digitorum profundus tendon. The muscle received irrigation from the anterior interosseous artery in 75% of the cases, while the others received direct irrigation from the deep radial artery or the ulnar artery. It received innervation from the anterior interosseous branch of the median nerve in 95.2% and the others from the ulnar nerve. Conclusion: Although the irrigation and innervation of this muscle continue to be debated, we are describing the neurovascular distribution in the Hispanic-Caribbean population. Our preliminary data suggest that GM should be significantly considered in the pain management of athletes with demanding forearm movements. The relationship between this muscle and the KNS should be further investigated.

**075**

## Conocimientos y Prácticas de Autocuidado del Pie Diabético en el Adulto con Diabetes Mellitus Tipo 2

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Trasfondo y objetivos: La DM2 es una de las crisis de salud pública más graves de nuestros tiempos. Las enfermedades del pie diabético (EPD) son de las complicaciones más graves y costosas de la DM2. Sin embargo, son las más prevenibles a través de prácticas de autocuidado (PA). Los objetivos de esta investigación fueron: (1) Medir el nivel de conocimientos sobre el cuidado de los pies, (2) Describir las PA del pie diabético y (3) Explorar la asociación entre el conocimiento y las PA del pie diabético. Método: Cuantitativo, no experimental con un diseño descriptivo-correlacional y transversal. Se utilizaron los instrumentos: Cuestionario sobre el Conocimiento del Cuidado del Pie y el Cuestionario Nottingham Sobre el Cuidado Funcional de los Pies. La muestra fue de 60 adultos con DM2 y participantes de una clínica de endocrinología. El 78% de la muestra eran féminas, con un promedio de 56.9 años de edad (DE=12.2), 11.8 años con el diagnóstico (DE=9.5) y un 32.5% con neuropatía. Aprobado por el IRB: 2305114476. Fecha: 6/22/2023. Resultados: El promedio del nivel de conocimiento sobre cuidado del pie fue 12.0 (DE = 1.7) de un máximo de 15 puntos. El 83.3% (n=50) de los participantes poseen un buen conocimiento y el 15.0% (n=9) un conocimiento satisfactorio. El 28.3% (n=17) indica buenas prácticas, el 60% (n=36) prácticas satisfactorias y el 11.7% pobres prácticas (n=7). El uso de polvo de talco, loción y tipo de vendaje son áreas de necesidad de conocimiento en más del 50% de la muestra. La correlación entre el conocimiento y las prácticas fue moderada y significativa (rho=0.341, p=0.008). Conclusión: A mayor conocimiento mejores son las PA. Por lo tanto, los profesionales de la salud deben continuar actualizando y reforzando los conocimientos sobre el autocuidado del pie diabético en los pacientes; para promover un comportamiento de autocuidado y prevenir complicaciones. Agradecimientos: A la Dra. Margarita Ramírez, a la Dr. Loida González y al personal de las Clínicas de Endocrinología del UDH, por facilitarnos el escenario para llevar a cabo esta investigación.

## 076

### Assessing Fetal-Type Circle of Willis in Puerto Rican Cadavers

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Abstract and Objectives: The Circle of Willis is crucial for collateral cerebral circulation. This detailed study investigates the prevalence and variations of the Fetal-Type configuration of the Posterior Circle of Willis (FTPCW) in Puerto Rican cadavers, marking a significant contribution to understanding cerebrovascular pathologies. Methodology: A meticulous examination of 41 brains was conducted at San Juan Bautista School of Medicine, excluding one due to damage. Sixteen cases of the fetal-type PCA were identified, including thirteen partial subtypes, one complete, and two indeterminate. Notably, two brains exhibited a bilateral partial FTPCW configuration. Results and Conclusions: The analysis revealed a high prevalence of the fetal configuration in the posterior Circle of Willis, suggesting a potential increase in cerebrovascular risk for the Puerto Rican population. These findings underscore the urgent need for further research to deeply understand these anatomical variations and their clinical impact.

## 077

### Levels of Vitamin D in Chronic Spinal Cord Injury Veterans residing in Puerto Rico

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Background & Objectives: Spinal Cord Injury (SCI) patients present several factors that contribute to increased osteoporosis risk, such as immobilization with impaired bone turnover, and limited sun exposure, all of which are associated with low levels of vitamin D. This study is designed to determine the prevalence of inadequate or severely deficient levels

of vitamin D in Veterans residing in Puerto Rico with chronic SCI. It aims to determine if there is evidence of a relationship between patient demographics, past fracture history, sunlight exposure, and vitamin D levels. Methods: A cross-sectional study is being conducted on 21 to 89-year-old Veterans with SCI who reside in Puerto Rico and have been seen at the VA Caribbean Healthcare System (VACHS) SCI Service from December 1, 2015, and forward. A questionnaire including demographic data, medical history, level of SCI, previous bone fractures, mobility status, sun exposure, and present medications is obtained. Laboratory samples are acquired including levels of 25-OH vitamin D, serum calcium, intact PTH, phosphate, albumin, creatinine, alkaline phosphate, magnesium, and vitamin B-12 levels. Results: Seventy-four adults participated in the study (64% paraplegic and 36% tetraplegic). These groups were demographically stratified by type of SCI where the average age of the sample collected in patients was 71 years old. Patients with tetraplegia obtained approximately an average of 38.0 ng/dL of Vitamin D in blood, while patients with paraplegia had an average of 36.4 ng/dL of 25-OH-Vitamin D. Conclusions: Further studies and interventions are needed to effectively manage and monitor vitamin D levels in SCI patients. This study will expand knowledge on the risk of osteoporosis within this population and on the necessary corrective interventions. Acknowledgments: This material is based upon work supported in part by Pathology and Laboratory Medicine Services at VAMC with resources and the use of facilities at the VACHS.

## 078

## Uncommon Find: An Unusual 10 cm Bezold's Abscess Involving Dural and Mastoid Erosion

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Introduction: Bezold's abscess (BA) is a rare complication of otitis media and acute mastoiditis that manifests as a lateral neck abscess due to collection of pus within the sternocleidomastoid muscle. Since the introduction of antibiotics, incidence of such abscess has significantly decreased. However, if initial infection is left untreated, the secretions and bacteria can spread and lead to skull erosion. This case report presents a case of BA with dural and mastoid erosion. Method: A 42-year-old white male presents with complaint of severe left ear pain, headaches, and left neck swelling. On physical examination, the patient had a temperature of 101.2 °F and purulent otorrhea from his left ear with associated tenderness and fluctuant swelling arising from the left mastoid process. Laboratory evaluation of the patient revealed leukocytosis with left shifting and hyperglycemia. Subsequently, a neck CT with contrast revealed a 10 cm loculation extending superiorly from the eroded skull base to posteroinferiorly into the supraclavicular region of the neck. Moreover, there was evidence of dural enhancement attributed to the erosion of the mastoid process caused by the abscess. Due to its size, the abscess compressed the left jugular vein, the transverse, and the sigmoid sinuses. Abscess was surgically drained, and wound culture was positive for *Streptococcus pneumoniae*. Results: Bezold's abscess typically arises as a complication of acute mastoiditis, originating from the coalescence of infected mastoid air cells. The classical clinical triad of ear discharge, neck pain, and a neck mass can be a diagnostic hallmark, but it is not always present. Imaging, such as high-resolution CT scans, plays a pivotal role in confirming the diagnosis and assessing the extent of the abscess. Management involved a multi-disciplinary approach, including otolaryngology and infectious disease specialists. In our case, positive wound culture results for *Streptococcus pneumonia* prompted wound irrigation with Clindamycin, while refraining from tympanostomy tube placement due to a substantial tympanic membrane perforation, necessitating the administration of intravenous broad-spectrum antibiotics alongside antibiotic ear drops for patient management. Conclusion: This case highlights the significance of recognizing Bezold's abscess as a potential complication of acute mastoiditis, even in the absence of the classic triad of symptoms. Early diagnosis, coupled with a

multidisciplinary approach, is essential for optimal patient outcomes. Clinicians should maintain a high index of suspicion for Bezold's abscess, and prompt imaging studies can aid in timely intervention. Sharing and analyzing cases like these contribute to a better understanding of rare conditions and enhance clinical decision-making.

## 079

### Efficiency of a Capstone Course Research Experience in Fomenting Undergraduate Research Skills: A Quantitative Analysis.

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Background and Objective: Research activities are essential in the academic ecosystem; however, many undergraduates do not engage in these experiences, as they may view them as disjointed from academic work. In addition, some alumni have strong theoretical mastery but lack the ability to apply their knowledge through practice. Therefore, providing these opportunities in a guided and structured fashion allows students to appreciate the value of research in their education. The objective of this study was to quantitatively assess the effectiveness of the capstone experience in fomenting research skills in Natural Sciences Interdisciplinary Studies (CNEI, in Spanish) program undergraduate students. Method: Anonymized student data from those enrolled in the first capstone course (CNEI 4011) during the Fall 2023 semester was analyzed to evaluate students' comprehension of scientific method-related concepts and research skills at the beginning and end of the semester. Student scores from two evaluation measures, scientific method application pre/post tests and capstone project draft and final proposals, were evaluated using paired t-tests. Results: Significant differences between the pre and post tests ($p < 0.05$; $p = 0.012$) and between the capstone proposal draft and final version ($p < 0.05$; $p = 6.24$ e-08) were found. Conclusion: Our results suggest that participation in the CNEI capstone experience enhances students' understanding of the scientific method and their ability to apply their knowledge in a practical setting. These results are also consistent with CNEI alumni survey comments where they express how the capstone course experience allowed them to develop transferable skills that they have been able to apply in graduate school or professional settings. Acknowledgement: This project was partially funded through NSF proposal #2122417.

## 080

### La depresión en la población mayor de 78 años en Puerto Rico, Proyecto PREHCO (2022-2023)

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Trasfondo: La depresión contribuye de manera importante a los costos de atención médica y se prevé que será una de las principales causas de morbilidad en los países de ingresos medios y altos para el año 2030. En la vejez se asocia con discapacidad, mayor mortalidad y peores resultados por enfermedades físicas. Se estima que cerca de un 15% de la población de adultos mayores no institucionalizados padece de depresión y dentro de los deprimidos se observan diferencias por sexo, edad y otras características. Objetivo: El objetivo de este trabajo es describir la depresión en adultos mayores residentes en Puerto Rico de acuerdo con sus características sociodemográficas. Método: El proyecto *El envejecimiento en Puerto Rico: Seguimiento longitudinal del Proyecto PREHCO (Tercera Fase)* está basado en una muestra estratificada por conglomerados. Los resultados están ponderados para ser representativos de la población de personas de 78 años o más en Puerto Rico para el año 2022. Se hizo uso de la escala de depresión geriátrica Yesavage de 15 preguntas, considerando como deprimidas aquellas personas que obtuvieron una puntuación mayor a 5. Resultados: La depresión impacta al 18.5% de la población puertorriqueña de 78 años o más. Esta condición afecta más a las mujeres (67.3%). Se observa que es más prevalente en el grupo más joven (78 a 84 años), alcanzando un 63.1%. Se destaca que cerca de la mitad, un 44%, de las personas que viven solas se ven afectadas por esta enfermedad. Conclusión: Dado que el envejecimiento poblacional de Puerto

Rico seguirá en aumento; se espera que la depresión figure como causa importante de morbilidad. Es imprescindible continuar haciendo estudios que contribuyan a la acumulación de conocimiento sobre ésta para atender las necesidades emergentes de esta población deprimida. Agradecimientos: El proyecto "El envejecimiento en Puerto Rico: Seguimiento longitudinal del Proyecto PREHCO" está auspiciado por el Instituto Nacional de la Vejez (NIA) [PTE Federal Award 1RO1AG064769-01]. This work has been partially supported by RCMI Grant U54-MD007600 from the National Institute of Minority Health and Health Disparities (NIMHD), National Institutes of Health (NIH).

## 081

### Comparing assessments of heritability using 2D and 3D morphometric data from the macaque vertebral column

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Background and Objectives: Understanding the relationship between genotype and phenotype is essential for unraveling evolutionary mechanisms. While genetic processes shape evolution, only phenotypes are preserved in the fossil record, so observing direct genetic changes is challenging. The characteristics of the vertebral column, consisting of a series of homologous elements highly conserved across taxa, combined with its well-characterized genetics and embryology, make this structure ideal for investigating genotype-phenotype relationships. The present study compares 2D and 3D morphological data to assess heritability (the proportion of variation attributed to the genotype) in the macaque vertebral column to identify the best method for capturing underlying genetic relationships. Methodology: We used a sample of 214 pedigreed Rhesus macaques (Cayo Santiago, Caribbean Primate Research Center). Individual vertebrae were scanned using the Artec Space Spider, and 3D landmark data were collected on representative vertebrae (C3, T3, and L2) using Checkpoint software. 2D data were then extracted from the 3D data.We conducted preliminary analyses on MorphoJ and used R to estimate heritability via a generalized linear mixed model incorporating pedigree information. Results: Our findings show that heritability estimates derived from linear and 3D coordinate data display no significant differences across vertebral segments in Rhesus macaques. T-test analyses confirmed this consistency, with all p >0.05, suggesting that the choice of dimensionality in data collection is a matter of convenience and will not affect the results. It also suggests that data from studies using different methodologies can be used interchangeably when considering heritability. Conclusion: These results inform data collection strategies in morphological research, affirming the reliability and effectiveness of 2D measurements in capturing shape for heritability studies, and can help guide future research. Acknowledgements: We thank Dr. Melween Martínez, Terry Kensler, and others at the Caribbean Primate Research Center for providing pedigree data and access to collections in their care. The Caribbean Primate Research Center is funded by NIH ORIP #2-P40-OD012217. This project is funded by a Catalyzer Grant from Puerto Rico Science, Technology, and Research Trust to CIV.

## 082

### Machine Learning as a Tool to Identify Warfarin Sensitivity in a Puerto Rican Cohort.

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Background and Objectives: Despite approval of novel direct oral anticoagulants, warfarin remains the most widely prescribed oral anticoagulant in the United States1 even though it has a narrow therapeutic index.2 An important cause of this narrow index is the

genetic polymorphisms in the warfarin metabolizing enzymes.3 Implementation efforts for genetic data into the clinical setting has been performed in populations where Latino/Hispanic groups are underrepresented.4 Machine learning (ML) gained traction as a method to predict drug response using a patient's genetic data.5 We hypothesized that we could train a ML algorithm (MLA) to determine if a patient is sensitive to warfarin using clinical information from a small cohort of Puerto Rican patients on warfarin. Methods: Clinical data from 156 patients was analyzed using eight MLA to determine which better predicts warfarin sensitivity. To balance data, random over sampling was performed. Linear discriminant analysis (LDA), gradient boosting classifier (GDB), decision tree classifier (DTC), support vector machine (SVC), logistic regression (LR), random forest classifier (CLF), k-nearest neighbor (KNN), and gaussian naive bayes (GNB) were tested to predict warfarin sensitivity. The receiver operating characteristic curve (ROC) analysis was performed to determine sensitivity. Results: GNB, CLF, SVC, LR, LDA, and GDB models had poor performance having low accuracy and low sensitivity values, while DTC and KNN had better performance. Conclusion: GNB, CLF, SVC, LR, LDA, GDB could not serve as ML models to predict warfarin sensitivity due to being inaccurate and inefficient. DTC was promising, having an accuracy of 73% and being 77% efficient, while better than most models, it would still need improvement to be useful. KNN was the best model having an accuracy of 81% and efficiency of 82%. More samples would be needed to better train the models. Acknowledgements: This work was supported by NIH, NIMHD, RCMI Grant # U54MD007600/5318, and NIGMS-RISE R25 GM061838.

## 083

## A Rare Occurrence: Bilateral Tibial Tubercle Avulsion Fractures in a Pediatric Hispanic Athlete – Case Analysis and Literature Exploration

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Purpose: Fractures in the proximal tibial tuberosity are rare injuries. Even more uncommon are bilateral simultaneous fractures. Due to the few cases reported in the literature, we aimed to present a case that may contribute to the diagnosis and treatment of bilateral simultaneous tibial tubercle fractures. The presented case is rare regarding the mechanism of injury, which has been scantly reported in the literature. Due to the rarity of atraumatic bilateral tibial tubercle fractures, we believe this documentation may be of clinical relevance. Case presentation: A 13-year-old Hispanic male presented to the emergency department after experiencing sudden knee buckling while running after standing up from the catcher's position (squatted) during a baseball game, causing him to collapse to the ground. Plain radiographs revealed displaced tibial tubercle avulsion fractures in both knees. He underwent bilateral open reduction and internal fixation. Fracture healing was completed without complications. Conclusion: We reported the first documented case of atraumatic bilateral simultaneous tibial tubercle avulsion fractures in a pediatric Hispanic baseball player. Although this is a rare type of fracture, our case serves as a reminder of the importance of having a high degree of clinical suspicion, which facilitates prompt diagnosis and surgical management of these injuries. Early identification and classification of these fractures allow for the determination of the appropriate treatment alternative and a faster return to pre-injury levels. Consequently, this leads to better outcomes and increased patient satisfaction. Due to the rarity of this pathology, and the importance of early diagnosis and management, we believe the dissemination of this case can be of clinical relevance and can contribute to the limited existing literature on the topic. Acknowledgments: The authors are grateful to the Department of Orthopaedic Surgery at the UPR-SoM for their support. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported.

## 084

### The Role of Calcium Signaling in Pericytes: Exploring an Underlying Cellular Mechanism in Pulmonary Arterial Hypertension

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Background and Objectives: Pulmonary Arterial Hypertension (PAH) is a distinct subtype of pulmonary hypertension characterized by aberrant microvessel proliferation and muscularization, leading to concentric or eccentric laminar sclerosis and vaso-occlusive lesions. This pathology results in progressive vascular fibrosis and elevated pulmonary vascular resistance (PVR), severely impacting lung function. PAH is characterized by impaired tissue repair due to disrupted communication between pericytes (PCs) and endothelial cells (EC). Pericytes in the pulmonary vasculature's basement membrane play a crucial role in vascular network formation through calcium-induced mechanisms. This research focuses on elucidating the role of calcium signaling in pericytes, specifically in the context of PAH. PAH donor pericytes are expected to exhibit elevated baseline intracellular calcium [Ca2+]i, primarily regulated by L-Type VGCCs. The heightened [Ca2+]i suggests potential upregulation of calcium-mediated processes, contributing to PAH pathophysiology. Methods: We analyzed three cell cultures—Human Brain Vascular Pericytes, Normal Pulmonary Pericytes, and PAH Donor Pericytes— and identified the calcium channels maintaining baseline concentration. Changes were induced using calcium channel modulators, and a Calcium Fluorescence Microscopy model was employed for real-time monitoring. Results: Control Donor Lung and PAH pericytes show reduced reactivity to depolarization, emphasizing the differences in homeostatic calcium in lung pericytes and potential impairments in calcium signaling in PAH. PAH pericytes demonstrate the highest baseline [Ca2+]i preceding any external stimulation or intervention compared to other cell types, indicating a unique calcium homeostatic profile compared to Human Brain pericytes and Control Lung pericytes. Conclusions: The findings indicate the presence of upregulated and impaired calcium-mediated cellular processes that facilitate specific pathophysiological mechanisms in Pulmonary Arterial Hypertension (PAH). A nuanced comprehension of these calcium dynamics within PAH pericytes has the potential to reveal viable therapeutic targets that can slow down the progression of pulmonary arterial hypertension. Acknowledgments: The present project received financial support from the National Institutes of Health (NIH) and was executed through a collaborative effort with Johns Hopkins Bayview Medical Center and Stanford Medicine.

## 085

### Association between history of polycystic ovary syndrome and cardiovascular health among young females in Puerto Rico.

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Background & Objectives: Polycystic ovary syndrome (PCOS) has been proposed as a reproductive risk factor for cardiometabolic outcomes. However, no studies in Puerto Rico have assessed the association between PCOS and Life's Essential 8, the recently updated metric proposed by the American Heart Association (AHA) for evaluating cardiovascular health. This study assessed the association between PCOS and CVH among young women in Puerto Rico, a population at high risk of cardiometabolic diseases. Methods: Cross-sectional data from the PR-OUTLOOK study was analyzed. Women aged 18-29 years (n=1,307) completed surveys, physical exams, and laboratory tests between September 2020 and November 2023. PCOS was self-reported in response to the question, "Have you ever been diagnosed with

PCOS? CVH consists of eight metrics: diet quality, physical activity, sleep health, nicotine exposure, BMI, non-HDL cholesterol, blood glucose, and blood pressure. Following AHA recommendations, the scoring system for each metric ranges from 0 to 100, and the total CVH score is calculated by adding the scores of all components and dividing by eight to provide an average. Higher scores indicate a better CVH. Linear regression modeled the association between PCOS and CVH, adjusting for age, education, marital status, and subjective social status. IRB Approved: 2310152006. Date: 12/20/2023. Results: CVH scores for women with and without self-reported PCOS were non-ideal (70.9 vs. 73.2). Linear regression showed statistically significant differences by PCOS status in overall CVH. Women with self-reported PCOS had two points lower scores for CVH than women without PCOS (ß=-2.3, IC 95%=-4.1, -0.5, p=0.015). After adjusting for covariates, this difference remained statistically significant (ß=-2.4, p=0.011). Conclusions: Women with PCOS have a worse CVH than women without CVH. Future studies in clinically diagnosed PCOS are warranted, given the urgency of enhancing and preserving CVH among young women. Acknowledgement: This work was supported by the National Heart, Lung, and Blood Institute (grant R01HL149119) and partially supported by the Hispanic Alliance for Clinical and Translational Research (NIGMS U54GM133807).

**086**

## Dysbiosis in female rats after Spinal Cord Injury and the effects of a broad spectrum antibiotic in the microbiome.

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Background & Objectives: Spinal cord injury (SCI) is a devastating pathological state causing motor, sensory and autonomic dysfunction. To date, SCI remains without viable treatment. After the injury, molecular events centered at the lesion epicenter create a repulsive and non-permissive environment. This newly hostile condition promotes inflammation, inhibits axonal regeneration, and locomotor progression. This burdensome scenario warrants a multifactorial approach in the development of viable treatment. The administration of Tamoxifen (TAM), a selective estrogen modulator (SERM), has shown to reduce cellular death and improve locomotor recovery after SCI. Nevertheless, the mechanisms behind which TAM can exert these neuroprotective events are unknown. We hypothesize that through the gut-brain axis, and the production of anti-inflammatory metabolites, the gut microbiome has an impact on the neuroprotective mechanisms behind TAM. Methods: Female rats received a moderate contusion at the thoracic (T10) spinal cord level using the NYU impactor device. To determine the association of the gut microbiome in the neuroprotective effects of TAM, rats were implanted with TAM pellets immediately after SCI. Fecal matter pellets were collected before the trauma, and 7, 14, 21 and 28 days after injury for DNA extractions and sequencing of 16S rRNA genes. Microbiota was analyzed using standard bioinformatic pipelines. However, the effect of antibiotic in rodents after surgery was first investigated. IACUC Approved: 2450121. Date: 6/22/2023. Results: The microbiota of naive animals changed with time, and animals treated with antibiotics after the surgery or SCI presented dysbiosis with significant changes ($p<0.05$) in the microbiota according to Two-Way ANOVA analysis. Conclusion: The dysbiosis after SCI, and heightened with antibiotics could affect the recovery time in rats. The management of this newly microbiome disbalance could be an alternate route towards a viable treatment for SCI. Acknowledgements: This research was supported by grants from the SC1GM144032, COBRE (P20-GM103642), and the PR Science & Technology Trust (2022-00125).

## 087

### Potential brain-specific activation of the transcription factor Nrf2/CncC by the probiotic *Lactiplantibacillus plantarum* in Drosophila larvae

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Background and objectives: The gut microbiota, comprising microorganisms like intestinal bacteria, significantly impacts host health. Recent findings reveal its influence on distant organs, including the brain, through the Gut Microbiota-Brain axis. 'Good bacteria' or probiotics, possessing anti-inflammatory and antioxidant properties, have been shown to enhance overall health. This project explores how *Lactiplantibacillus plantarum* (*L. plantarum*), a probiotic, may activate the conserved transcription factor Nrf2 (in mammals) / CncC (in flies), offering potential brain-specific benefits. It has been shown in flies and mice that *L. plantarum* can activate Nrf2/ CncC in the gut and liver, respectively. This Nrf2/CncC activation by *L. plantarum* provided cytoprotection to the animals by activating the antioxidant response. Methods: To achieve our goal, we are using the fruit fly *Drosophila melanogaster* as a model system, specifically transgenic larvae carrying an Nrf2/CncC genetic reporter. Our approach involves several key steps: (I) Culturing *L. plantarum* from a glycerol stock and cultivating them in MRS Broth, (II) Collecting transgenic larvae during the 2-3rd instar stage and exposing them to *L. plantarum* for 24 hours, (III) Dissecting and preserving the gut, brain, and fat body tissues in 4% formaldehyde overnight, and (IV) Performing immunohistochemistry and analyzing the tissues using fluorescence microscopy. Results: Our preliminary data shows that larvae fed *L. plantarum* as a probiotic for 24 hours is sufficient to activate Nrf2/CncC in the brain optic lobe. Future functional genomics experiments will be done to understand the physiological consequences of *L. plantarum*-mediated Nrf2/CncC activation in the brain and whether this has a role in brain development. Conclusions: Data coming from this project will provide additional evidence on how the gut microbiome can influence the brain and provide a benefit to the animal. Acknowledgements: LS thanks UPRRP Honors Program, Dr. Esther Peterson lab (UPRRP) and the NIEF confocal facilities (UPR Molecular Science Building). IARF funding provided by NIH-NIGMS COBRE (5P20GM103642-10) and the Catalyzer Research Grant (#2023-00056) Puerto Rico Science, Technology & Research Trust (PRST). Thanks to W. Ludington from Carnegie Science for providing LpWF strain.

## 088

### Anatomical Study of the Vertebral Artery Transposition and its Clinical Relevance

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This study aimed to precisely measure the average length of V segments of the vertebral artery, with a focus on facilitating meticulous preoperative planning for lesions along the foramen magnum anterolateral to the brainstem and the odontoid process of C2. Methods: Twelve formalin-fixed specimens injected using the six-vessel technique were immersed in 70% ethanol for optimal tissue fixation. After a 48-hour waiting period for latex setting, specimens were dissected under microscopic magnification, exposing the vertebral artery. Measurements were taken after opening the foramen of C1 and C2. CT images were analyzed using the EPIC hyperspace production software. A detailed illustration of the measurement process and step-by-step dissection and craniotomy procedures were provided. Results: The mean percentage of vertebral artery mobilization after opening C1 and C2 foramen was 24.8% and 32.3%, respectively. CT scans from 200 patients provided mean lengths for vertebral artery segments. Conclusion: Understanding the patient's unique vertebral artery configuration in comparison to average measurements enhances surgical planning for far lateral approaches. This individualized strategy,

mobilizing the vertebral artery instead of navigating around it, improves safety margins and patient outcomes in skull base pathologies. These findings offer valuable insights for optimizing alterations to the far lateral approach, particularly in challenging cases requiring complete exposure.

## 089

### Taller anual de Recinto Pa' la Calle: Transformación de conocimiento sobre sinhogarismo y uso de drogas

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Trasfondo y Objetivos: Recinto Pa' la Calle (RPC) es un colectivo estudiantil de la Universidad de Puerto Rico, Recinto de Ciencias Médicas que provee alimento y servicios de primera necesidad a personas sin hogar (PSH) y personas que usan drogas (PQUD). RPC celebra un taller anual para educar a estudiantes sobre su modelo de reducción de daños, la ética del voluntariado y el sinhogarismo. En octubre de 2023 administramos a los participantes una pre y posprueba sobre el contenido del taller para medir cambios en conocimiento y percepción. Métodos: Formulamos una encuesta digital de seis preguntas sobre el uso de drogas, medidas de reducción de daños y nociones del sinhogarismo utilizando una escala Likert de cuatro puntos (1-En desacuerdo y 4-De acuerdo). Analizamos las respuestas solo de individuos que completaron la pre y la posprueba con un Wilcoxon signed-rank test. También recogimos insumos escritos sobre la experiencia del taller. Resultados: El taller recibió 80 participantes de los cuales incluimos 61 (76%) en el análisis. La mayoría de esta muestra fue fémina (62%). Los estudiantes eran mayormente graduados (62%) cursando Medicina (46%). Luego del taller, aumentaron significativamente los aciertos para cinco de las seis preguntas. Recibimos insumo positivo sobre el manejo de los temas y la naturaleza práctica e interactiva del taller. Los participantes sugirieron que se realice el taller con más frecuencia y que cambie el local y su duración. Conclusión: RPC promueve la empatía y la conciencia hacia las PSH y PQUD. El taller educó y transformó perspectivas sobre la reducción de daños y el sinhogarismo. Afirmamos la importancia del taller anual en adelantar la visión de RPC: desarrollar una red de apoyo dentro del sistema de salud para personas experimentando pobreza, sinhogarismo y adicción. Agradecimiento: Agradecemos las donaciones, voluntariado y líderes que sostienen la labor de RPC.

## 090

### Anatomical Variations of the Trajectory of the Recurrent Branch of the Median Nerve

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Background & Objectives: The recurrent branch of the median nerve controls motor function of the thenar muscles in the hand, enabling precision grip and dexterity, and provides crucial sensory feedback for tactile discrimination. This study utilized Poisel's classification system, which defines three variations of the recurrent branch: extraligamentous, subligamentous, and transligamentous. The extraligamentous type, the most common, the branch arises distal to the flexor retinaculum and curves back to supply the thenar muscles. The subligamentous type arises within the carpal tunnel deep to the flexor retinaculum; it then curves around its distal border to supply the thenar muscles. The transligamentous type arises within the carpal tunnel and pierces the flexor retinaculum to supply the musculature. This study aimed to document the most common anatomical variations of the recurrent branch of the median nerve in a sample of the Puerto Rican population. Methods: An observational study was conducted at the San Juan Bautista School of Medicine Anatomy Lab. Dissection of the palmar aspect of each hand was performed following Clemente's Anatomy Dissector procedure. Results: Of the thirty-four hands studied, five hands were discarded due to median nerve damage or absence of the recurrent branch, yielding a total of twenty-nine branches. Eight branches (27.6%) were classified as extraligamentous, nine

(31%) as subligamentous, and twelve (41.4%) as transligamentous. Conclusion: Our study revealed a higher prevalence of the transligamentous variation, deviating from the literature's most commonly reported recurrent branch variation. Recognizing the anatomical variations in the recurrent branch's position and trajectory at the wrist is crucial for surgically treating carpal tunnel syndrome, ensuring injury prevention during decompression in affected patients. Further studies are needed to assess whether the Puerto Rican population differs from findings in other research, considering the potential limitations of our results due to a small sample size.

## 091

### Trastuzumab-conjugated liposomes loaded with siRNA against LCN2 for Inflammatory Breast Cancer

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Background and Objectives. Breast cancer (BC) is a major health concern, constituting 30% of newly diagnosed cancer cases in the United States for women. Inflammatory Breast Cancer (IBC), a rare yet highly aggressive subtype (1-5% of BC cases), often leads to misdiagnosis due to its inflammatory nature and absence of a palpable mass. Typically diagnosed at an advanced metastatic stage, IBC frequently exhibits Human Epidermal Growth Factor Receptor2 (HER2) overexpression, leading to treatment with Trastuzumab, but resistance is common, causing a need for alternative therapies. Lipocalin-2 (LCN2), a protein involved in iron regulation, immune responses, and cancer cell behaviour, is a potential therapy target for IBC. Our research has shown elevated LCN2 levels in IBC compared to non-IBC cases, with LCN2-small interference RNA (siRNA) effectively reducing IBC cell proliferation and invasion. Methods. We conducted RNA-sequencing on IBC cells transfected with LCN2-siRNA to understand the effect of the treatment. To target LCN2 in HER2+ IBC cells, we developed Herceptin-conjugated liposomes loaded with LCN2-siRNA for enhanced internalization. Results. RNA-sequencing identified 138 dysregulated genes, including SOX18 and LRP4, linked to metastasis and cancer-related pathways. Ingenuity Pathway Analysis revealed alterations in 25 canonical pathways, validated by PCR. To target LCN2, Herceptin-conjugated liposomes loaded with LCN2-siRNA were developed for enhanced internalization in HER2+ IBC cells. Trastuzumab DSPE-PEG(2000)-maleimide conjugates were synthesized for liposomal formulation, resulting in sizes of 18.3 nm and 73.7 nm for free DSPE-PEG(2000)-trastuzumab and trastuzumab-liposome, respectively. Conclusions. Optimal liposome internalization was determined by treating IBC cells with cy3-siRNA-loaded liposomes at various timepoints (2, 8, 24, and 48 hours). Ongoing work aims to assess LCN2 knockdown effects after 24 and 48 hours of liposomal treatment, with the goal of developing a targeted therapy for Inflammatory Breast Cancer. Acknowledgments. This research was funded by NIGMS-SuRE Program, 1R16GM145558-01 (PEVM), UPR-CCC, and NIGMS-RISE, R25-GM061838

## 092

### Hispanic Caregivers' Experiences About their Most Helpful Resources to Improve Care and Management of Type 1 Diabetes in their Adolescent Offspring

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Introduction: Caregivers of children with type 1 diabetes (T1D) feel overwhelmed with the demands of their offspring's treatment regimen. However, few studies have examined Hispanic parents' opinions about which resources may better help to reduce their burden. We examined caregivers' reports about their most helpful resources to manage T1D in their

offspring and the relationship between accessing multiple resources and diabetes-related outcomes. Methods: Participants were 65 Hispanic caregivers (81.54% women) aged 32–58 (*M*=43.34) who completed eligibility assessments for an adolescent depression treatment study (IRB-approved). They answered an open-ended question about resources that helped them to improve diabetes care and management in their children (aged 12-17 years). We identified the main themes of responses and coded them using categories based on their content. We used the Chi-square test, MANOVA/ANOVA ($p \leq .05$), and Pearson correlation to assess associations between reports including ≥2 themes and diabetes-related criteria. IRB Approved: 1112-005. Date: 1/28/2020. Results: Caregivers' responses produced 120 codable units. Agreement between two coders was excellent (κ=.96). Resources identified by caregivers and their occurrence were: "Formal Support/Education Resources" (60.00%), "Self-Education/Self-Support" (20.83%), "Non-Professional Social Support" (9.17%), "Support to Alleviate Financial Costs" (4.17%), "Advances in Self-Care Devices" (2.50%) and "Did Not Identify Anything/Nothing Has Been Enough" (3.33%). The proportion of caregivers with responses coded within these categories was 81.54%, 33.85%, 16.92%, 7.69%, 4.62%, and 6.15%, respectively. Caregivers who identified ≥2 types or resources had offspring with better glycemic control, more life satisfaction, higher self-care scores, more frequent use of medical identifications, and less frequent barriers to adherence than their counterparts. Coding ≥2 themes also related to fewer diabetes-related stigma experiences in adolescents. Conclusion: Assuring frequent support for Hispanic caregivers of T1D youth, particularly from professionals and community organizations, and promoting disease-related self-education, may be essential to enhance adolescents' self-care, increase their life satisfaction, reduce treatment barriers, and improve their glycemic control. Acknowledgements: This study was supported by the National Institute of Diabetes and Digestive and Kidney Diseases (R03DK092547). Work on this study was also possible thanks to Institutional Funds for Research granted to the second and fourth authors by the Deanship of Graduate Studies and Research of the University of Puerto Rico, Río Piedras Campus.

## 093

### The Median Artery: Bilateral Persistence in a Cadaveric Specimen - A Case Report

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The median artery is of embryological importance because it irrigates the hand during the first 44 days or eight weeks of intrauterine life. The blood vessels proliferate in the limb bud mesoderm to form a vascular plexus. A component of this plexus is the axial artery in the forearm, which then becomes the anterior interosseous artery, and later is replaced by the median artery. The median artery is then replaced by the ulnar and radial artery and is called a persistent median artery (PMA) if it does not regress. During the dissection of the upper extremity of a male cadaver, we found a case of bilateral persistence of the median artery. The artery originates on both limbs from the common interosseous artery, runs along the median nerve, and passes through the carpal tunnel and anastomoses with the ulnar artery to form the superficial palmar arch. Two types of persistence of the median artery in adults, the palmar type and the antebrachial type, have been described. The palmar type is a long vessel that reaches the hand, and the antebrachial type is a short vessel that ends before reaching the wrist and hand region. Our case corresponds bilaterally to the palmar type. The trajectory of the PMA and its branches can lead to pathologies such as carpal tunnel syndrome, pronator teres syndrome, median nerve neuropathy, or the compression of the anterior interosseous nerve. The PMA should also be taken into consideration when harvesting the palmaris longus tendon. This case of bilateral persistence of the palmar type of the median artery provides detailed anatomical insights, highlighting its course in the forearm and palm along with its embryological and clinical significance.

## 094

### Synthesis of Andrographolide Derivatives as Potential Treatment for Prostate Cancer.

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Background: Prostate cancer (PCa) is the most diagnosed cancer in men in the USA. Andrographolide (AG) is a labdane diterpenoid compound isolated from *Andrographis paniculata*. Studies in our laboratory showed that Andrographolide decreased cell migration and invasion and increased cell apoptosis in PCa cells. *In vivo* studies showed that AG reduced prostate cancer tumor volume in mice. We showed that one of the mechanisms of the anticancer activity of andrographolide is through DNA damage. Microarray analysis of tumors treated with AG (10 mg/kg and 25mg/kg) showed differential expression of 674 and 218 genes, respectively. Even though AG shows significant biological activity and promising results, further use of AG in pharmacology is hindered by its poor selectivity and low solubility. Objective: The aim of this study is to design novel and AG derivatives specifically designed to inhibit NF-kB p50 and its activity in PCa with improved potency, selectivity, and bioavailability. Methodology: We used computational molecular docking to guide the synthesis of novel AG derivatives that covalently bind to a critical cysteine residue of NF-kB. Results: We synthesized novel AG derivatives where the cysteine-reactive α-alkylidene γ-butyrolactone is replaced with alternate warheads that could increase its activity. These novel compounds will be tested for activity, including cytotoxicity, cell growth inhibition, and NF-kB p50 inhibition in PCa cells. Conclusion: We have developed a synthetic route to novel AG derivates to obtain more potent and more selective inhibitors for NF-kB p50. In future studies, the compound with the most potent biological activity will be evaluated in *in vivo* studies. Acknowledgments: Puerto Rico Science, Technology & Research Trust Catalyzer Grant, School of Pharmacy Graduate Program Research Award and G-RISE.

## 095

## Food insecurity is associated with insomnia-related symptoms in young adults in Puerto Rico

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Background & Objectives: Food insecurity (FI) has been linked to insomnia-related symptoms in young adults, a group prone to insomnia symptoms such as extended periods of wakefulness before sleep onset and trouble maintaining sleep. Given Puerto Rico's high prevalence of FI (33.2%), our study aimed to examine the association between FI and insomnia-related symptoms. Methods: Cross-sectional analysis of the PR-OUTLOOK cohort study (ages 18-29; November 2020 to December 2022). Food insecurity was measured using the six-item US Department of Agriculture Household Food Security Scale (score≥2). Clinically significant insomnia was determined using the Women's Health Initiative Insomnia Rating Scale (WHIIRS); the scale has a total of 20 points, with each item being scored from 0 to 4. A score above 9 classifies an individual as having clinically significant insomnia. Logistic regression models estimated odds ratios (OR) with 95% confidence intervals (CI), adjusting for age, sex, marital status, social material deprivation, vaping, and BMI. IRB Approved: 2211060376. Date: 12/14/2022. Results: Of the 1,461 young adults (874 women and 587 men), 309 (21.2%) met the criteria for food insecurity. A higher proportion of insomnia-related symptoms was reported by food insecure individuals at 39.8.%, compared to 26.8% who were food secure ($p < 0.001$). Analysis revealed a significant association between food insecurity and insomnia-related symptoms (OR=1.81, 95% CI= 1.39, 2.35). This association remained significant even after adjusting for covariates, with food insecure young adults having higher odds of insomnia-related symptoms (OR=1.63, 95% CI= 1.24, 2.14) than those food secure. Conclusion: Food insecurity was common in this sample of young adults and associated with insomnia-related symptoms. Public health interventions addressing food insecurity are needed to preserve the sleep health of young adults in Puerto Rico. Acknowledgement: This work was supported by the National Heart, Lung, and Blood Institute (grant R01HL149119) and partially supported by the Hispanic Alliance for Clinical and Translational Research (NIGMS U54GM133807).

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## Solubilization and drug delivery tracking of Andrographolide in prostate cancer cells using CBQDs and AuAgCBQDs as drug delivery platforms

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Background & Objectives: A drug's absorption and effectiveness are dependent on water solubility, dissolution velocity, permeability to drugs, susceptibility to efflux processes and first-pass metabolism. Since many active pharmacological substances have low water solubility, their potential bioactivity remains hindered. As a solution to this challenge, we propose nano-systems composed of Carbon-Based Quantum Dots (CBQDs) and CBQDs covering a Gold-Silver (AuAg) alloy core to aid in anti-cancer therapy and drug delivery tracking. CBQDs belong to carbon-based nanomaterials, known to be efficient drug delivery platforms with high biocompatibility. Methods: We used Andrographolide as a hydrophobic drug model and Nuclear Magnetic Resonance (NMR) to measure partition coefficient (Log P) and thus the improvement in solubility and hydrophilicity that the synthesized nanoparticles could bring. MTS assays were done to measure toxicity of the lone nanoparticles. Drug delivery tracking was done via confocal microscopy and confirmed via surface enhanced Raman spectroscopy (SERS) in PC-3 cells. Solubility improvement was also estimated via the General Solubility Equation (GSE). Results: Using these nanoparticles, a significant improvement in hydrophilicity was observed in Andrographolide. The non-metal nanoparticles alone were confirmed to be between being non-toxic and having low toxicity on PC-3 and RWPE-1 cells. Confocal microscopy confirmed entry of nanoparticles with the loaded drug at 2h and SERS confirmed they entered together within the PC-3 cells. Conclusions: CBQDs and AuAgCBQDs work well to improve the hydrophilicity of Andrographolide, and the cell internalization was able to be confirmed. MTS assays to measure the toxicity of metal-CBQD nanocomposites will be performed soon. Acknowledgements: NIH-RISE Grant 5R25GM061151-20, NASA Cooperative Agreements 80NSSC20M0052 and 80NSSC22M0025, Brookhaven National Lab's Center for Functional Nanomaterials (User Proposal #312416 & #308523). Provisional patent number: 63/492,024.

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## Lymph Node-Tumor Proximity as a Determinant of Anti-Cancer T-cell Immune Response

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Background & Objectives: Melanoma is the most aggressive form of skin cancer, affecting 1 in 5 Americans. Immunotherapy advancements, such as immune checkpoint blockers, have boosted outcomes for 30-40% of advanced melanoma patients, despite a 71% survival drop in when melanoma metastasizes to lymph nodes. It has been shown that tumor-draining lymph nodes are critical for generating anti-cancer T-cells that initiate the attack response but are often the first site of metastasis. Therefore, we aim to understand anti-cancer T-cell activation mechanisms to enhance immunotherapy response rates. We hypothesize that the distance between lymph nodes and tumors positively correlates with the magnitude of anti-cancer T-cell response. Methods: B16F10 and B16F10-OVA murine melanoma cells were cultured and later implanted in the flank of mice to establish tumors. After 9 days,

the tumors, tumor draining and non-tumor draining inguinal and axillary lymph nodes were dissected and analyzed by flow cytometry to evaluate their T-cell phenotypes. In addition, a co-culture ex vivo assay with B16F10-OVA and OT-1 T-cells was performed to analyze the response of CD8+ T-cells to the tumor antigen. Results: Fewer phenotypic markers of T-cell cytotoxicity and activation, such as CD44 and GzmB, were found on T-cells in lymph nodes closer to the origin of the tumors and more in those farther away. Furthermore, it showed a trend towards non-draining lymph nodes containing more CD8+ T-cells. Conclusion: Tumor antigen recognition drives T-cell activation and its ability to induce cell death, which we propose is suppressed in lymph nodes closer to the primary tumor. Thus, delivering immune checkpoint blockers to the more distal lymph nodes will help facilitate CD8+ T-cell activation and the elimination of cancer cells. This approach would enhance the body's natural defenses against cancer and could contribute to the development of more personalized treatment strategies for patients with melanoma. Acknowledgements: Thanks to Padera Lab members for their mentorship and project guidance.

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## Improving Breastfeeding Rates In The Neonatal Intensive Care Unit: A Qi Project.

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Background: Breastmilk is the ideal nutrition for infants. Infants admitted to Neonatal Intensive Care Units (NICU) experience physical separation from their mothers, interfering with establishing and maintaining breastfeeding. Our objective is to increase the number of infants who are fed breast milk in the University Pediatric Hospital NICU. Methods: We used the Plan Do Study Act method for quality improvement. We established breastfeeding baseline data by reviewing infants' medical record feeding data during 2019. Our first cycle was a survey, completed by 114 mothers, to understand barriers to breast milk feeding. Knowledge gaps were identified. Factors associated with not breastfeeding were lower education, not feeling confident in succeeding, and lack of family support. A run chart was used to plot the monthly number of infants fed breast milk. In 2021, we developed a short video about milk extraction and delivery to the NICU. We aimed to increase by 25% the number of infants fed breast milk. IRB approved. During COVID-19 restrictions (2021-2022) the mothers were called by phone and referred to a QR code link to the video. In 2023 they were approached in person. Results: Audits included 1,220 infants from 2019-2023. Baseline data showed 30% of infants fed breastmilk. Most mothers (98%) understood the information in the video. A higher number of mothers watched the educational video since in-person interventions implemented (19% telephone, 83% in-person). Nevertheless, breastfeeding rates have remained at 30%. Conclusions: The intervention studied alone was not successful in improving breastfeeding rates in NICU. We recognize that many factors influence the ability of mothers to bring breast milk during a prolonged NICU stay. Our next cycle is to develop another short video addressing breast milk benefits for infants in NICU, especially those born preterm. This will address the knowledge gap found in the needs assessment.

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## Morphological and Molecular Effects of Notch Gene Inhibition During Intestinal Regeneration

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Background & Objectives: Regenerative biology represents a prominent scientific area with the potential to yield groundbreaking discoveries for medical approaches. Among the invertebrate deuterostomes, the echinoderm *Holothuria glaberrima* has garnered attention as a notable study model with the remarkable capabilities of regenerating its radial

nerve cord and gastrointestinal tract. The objective of our project is to target possible pathways and genes that may be essential during nerve and intestinal regeneration. We have focused on the Notch pathway, which previous studies have shown to be involved in regeneration in another echinoderm class. Methods: We have used a Notch pathway inhibitor, DAPT, and analyzed its effects on intestinal regeneration. Animals were injected 43µM intracoelomicaly (DAPT – Notch Inhibitor) (DMSO – vehicle) following evisceration on 3rd, 4th, and 5th day and allowed to regenerate for eight days prior to dissection. Intestinal tissues were analyzed histologically for cell proliferation, cell dedifferentiation and extracellular matrix remodeling (ECM). The size of the regenerating intestinal rudiment was determined. Results: Previous studies have shown that during intestinal regeneration, a transient blastema-like structure forms at the tip of the mesentery. This structure results from cell dedifferentiation migration and proliferation and gives rise to the new organ. Our results show that animals injected with the inhibitor tend to show a smaller structure, although the differences are not significant. Similar effects were observed in cell dedifferentiation and ECM. DMSO-treated control showed a more advanced dedifferentiation response and a more advanced ECM remodeling than animals treated with the Notch inhibitor. Conclusions: Preliminary results strongly suggest a positive role of the Notch Signaling Pathway in intestinal regeneration, particularly influencing processes like cell dedifferentiation and migration. Our research holds promise in unraveling fundamental genes and cellular conditions needed for successful regeneration, with potential applications extending beyond the intestinal system into broader health and therapeutics contexts. Acknowledgments: This research was supported by PR-LSAMP.

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## Assessment of virulence factors in H. pylori positive gastrointestinal metaplasia samples

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Gastric cancer is the fifth most common cancer and the fourth leading cause of cancer-related mortality worldwide. In the United States, it has been estimated that there will be approximately 26,500 new cases of gastric cancer in the year 2023, resulting in approximately 11,130 deaths. The presence of *H. pylori* infection has been demonstrated to be correlated with the development of chronic inflammation in the stomach, which in turn can lead to the development of gastric cancer. The pathogenicity of *H. pylori* has been increasingly linked to its virulence factors VacA and CagA, each of which induces distinct pathways leading to its colonization and disruption of gastric homeostasis. In this study, we aimed to assess the presence of these virulence factors in *H. pylori* positive gastrointestinal metaplasia samples from Hispanic patients living in Puerto Rico. A cross-sectional study was carried out using fresh frozen and formalin-fixed paraffin-embedded (FFPE) tissue samples from patients recruited throughout the Puerto Rico Familial Colorectal Cancer Registry (PURIFICAR). Real-time PCR was used to detect the virulence factors of *H. pylori*, VacAs, VacAm, and CagA genes. A total of 65.2% (15/23) of the samples were VacAs positive, with 26.7% (4/15) of these also being VacAm positive, and 53.3% (8/15) being CagA positive. A total of 17.4% of samples were positive for all three genotypes tested. The presence of *H. pylori* virulence factors was associated with patient sex ($p = 0.031$) and advanced age ($p = 0.0907$). In summary, in this study, we validated a methodology for assessing the presence of *H. pylori* virulence factors in patients infected with *H. pylori*. Further studies of a bigger population of Hispanics living in Puerto Rico can help assess the use of this type of genotyping in assessing high-risk patients' surveillance, improving precision treatment, and preventing antibiotic resistance.

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## Hispanic Women Living with Children in Puerto Rico During the COVID-19 Pandemic: Socioeconomic Problems, Life Disruption, and Health Challenges

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Background/Objective: Pandemic-management measures imposed living conditions that may have a larger impact on women living with children (WLWC). Few studies have examined their socioeconomic problems, life disruption, and health-related challenges during the outbreak. We explored differences in these domains between WLWC (G1; *n*=375) and women with no child at home (G2; *n*=668) during the pandemic. Methods: Participants (aged 21–79 years) responded to an online survey conducted from June 10, 2020–June 9, 2021 (IRB-approved). They had to be Puerto Rico residents for ≥3 months, have Internet access, and understand Spanish. Women answered questions about demographic, socioeconomic and health-related variables and completed the Patient Health Questionnaire-4, the Primary Care PTSD Screen for DSM-5, the Fear of Coronavirus-19 Infection (FOCI) Questionnaire, the Pandemic-Related Social Distance Measures (PRSDM) Life Disruption Scale, and the Pandemic-Related Shutdown Measures (PRSM) Life Disruption Scale. Using Chi-square and Student t-tests, we compared groups in categorical and continuous variables, respectively ($p \leq .05$). Results: Although groups were similar in employment rates, a higher proportion of WLWC faced a hostile work environment. They also reported higher rates of anxiety and depression symptoms and significantly higher scores on stress at work, risk of losing their homes, worries about food running out, having an unbalanced/unhealthy diet, need for social support, FOCI, impairment due to PTSD symptoms, and life disruption due to PRSM and PRSDM. A lower percentage of WLWC reported a lifetime history of mental health services or an outbreak history of physical health services. G2 members reported higher scores on perception of home structural safety, quality and availability of physical health services, quality of mental health services, and willingness for physical health services. Conclusion: Our findings show the extent of the pandemic-related strain experienced by Hispanic WLWC and the urge for designing specific programs to ameliorate their burden in future public emergencies. Acknowledgements: This study was financed with the personal funds of the researchers.

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## Evaluating Ergosterol Peroxide's anti-metastatic effects in an In vivo Triple Negative Breast Cancer Model

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Background and Objective: Triple negative breast cancer (TNBC) constitutes approximately 15% of all breast cancers, entailing lower overall survival rates due to its rapid growth and spread. TNBC tumors lack the expression of the estrogen receptors (ER), progesterone receptors (PR), and exhibit minimal human epidermal growth factor 2 (HER2) production. About 25% of TNBC patients are prone to distant metastases, commonly affecting the lungs, liver, and brain. Ergosterol peroxide (EP), a compound extracted from the medicinal mushroom *Ganoderma lucidum*, displays anti-tumor properties and inhibits cancer cell proliferation. This study investigates the effects of EP in the metastasis of cancer cells into the lungs and livers of mice injected with the MDA-MB-231 TNBC cell line. Methods: Female SCID mice (n=18/group) were injected with GFP-MDA-MB-231 cells (~$1 \times 10^6$) into the fourth right mammary fat pad. Mice were divided equally into vehicle and EP groups. The vehicle group received 10% ethanol and 90% corn oil, and the EP group received 100mg/kg BW of EP, through oral gavage. Upon euthanasia, lungs and livers were excised and stored in liquid $N_2$. The gallbladder in the liver was removed. The livers and lungs were cleaned with 1X PBS and imaged using an Olympus MV10 fluorescence macro zoom stereoscope. The number of metastatic foci, and

fluorescent region area were quantified using ImageJ software. Data analysis employed Microsoft Excel, GraphPad Prism and R software. Results: A highly significant ($P$<0.001) decrease in the metastasized tumor area was observed in EP treated mice compared to the vehicle group. These significant EP induced anti-metastatic effects extended to both lung and liver metastatic foci areas. While the EP-treated group exhibited fewer metastatic foci, the difference was not statistically significant. Conclusion: This study suggests the treatment with EP has potential anti-metastatic effects increasing the potential of EP as a potent anti-cancer agent. Acknowledgements: In this study, we acknowledge the funding support from NIH/NIGMS and Puerto Rico Science, Technology and Research Trust- Therapeutic Accelerator Program. We extend our gratitude to our laboratory technician, Mercedes Lacourt, MS, and students Diego Román and Gabrielle Silverio for their valuable contributions to this project.

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### SCAMP3 Mediated EGFR Endocytosis Regulates STAT3

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Background and Objectives: Triple-negative breast cancer (TNBC) cells pose a significant challenge due to their lack of hormone receptors (ER, PR) and ERBB2 receptors, having high metastatic potential and limited therapeutic options. The Secretory Carrier Associated Membrane Protein 3 (SCAMP3) has been studied to have crucial involvement in promoting breast cancer proliferation, migration, and invasion. This is achieved by its negative regulation of epidermal growth factor receptor (EGFR) degradation and modulation of the signal transducer and transcription activator (STAT) signaling pathway. However, SCAMP3's specific role in STAT3 remains unclear. We aim to investigate the mechanism of action of SCAMP3 on the STAT3 pathway. Methods: Utilizing western blot analysis, we assessed the expression of SCAMP3 in different TNBC cell lines. Furthermore, we investigated the activation of STAT3 (p-STAT3), EGFR (p-EGFR), and ERK (p-ERK) in TNBC cells (SUM-149, MDA-MB-231, and MDA-MB-468) treated with either vehicle, erlotinib (an EGFR inhibitor), or C188-9 (a STAT3 inhibitor). Cells were pre-treated with EGF and/or PAO (a clathrin-dependent endocytosis inhibitor). Results: Immunoblots show that TNBC cells have more expression of SCAMP3 than HER2+ subtypes. In SUM-149 cells with SCAMP3 expression, EGFR phosphorylation increased when the endocytosis was blocked and STAT3 signaling was not affected. Contrary to what we observed in SUM-149 cells, blocking endocytosis decreased STAT3 signaling and SCAMP3 expression increased in MDA-MB-468. Interestingly, when endocytosis and STAT3 are inhibited, the phosphorylation of STAT3 at Ser727 increased. In MDA-MB-231 cells, inhibition of endocytosis decreased SCAMP3 expression, did not affected the phosphorylation of EGFR phosphorylation, but decreased STAT3 activation in Tyr705 and increased the phosphorylation of STAT3 at Ser727. Conclusions: These results suggest that when clathrin-dependent endocytosis is inhibited, EGFR endocytosis is mediated by SCAMP3 keeping the STAT3 pathway active. We can conclude that that SCAMP3 has a significant role in regulating TNBC through EGFR/ STAT3 pathway. Acknowledgments: NIH/NIGMS #SC2GM141720 to ISA, RISE-UCC.

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### Neonatal Complications Associated with Maternal Mental Stress in the NICU

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Background and objectives: The admission of a newborn to the Neonatal Intensive Care Unit (NICU) poses emotional challenges for mothers (i.e., stress, anxiety, and fear) impacting maternal psychological well-being. Neonatal conditions and complications have been identified as a pivotal factor (Dudek-Schriber, 2004) affecting maternal emotional well-being. This study aims to investigate the association between specific neonatal medical complications and NICU related maternal stress. Understanding this association is vital for devising support systems for mothers with neonates in the NICU. Methods: n=172 mothers with babies in the NICU-Pediatric Hospital of PR, were interviewed using a structured psychological assessment protocol. Interviews included the "NICU stress" scale: 46 items ascertaining stress and its intensity on a scale of 1-5. The sub-scales were: the physical environment, relations with staff, infant physical and behavior and maternal role. The association between the level of NICU stress (total and subscales) and neonatal health complications (hematological, cardiological, respiratory and others) was analyzed using subgroup and correlation analysis. Results: In the subgroup analysis, mothers with neonates suffering from more than one type of health complications reported higher levels of NICU stress. Mothers of neonates that had both respiratory and hematological complications reported the highest NICU stress levels. In addition, the highest levels of stress (4 & 5) were reported in the physical environment and the infant physical and behavior sub scales. The overall correlation between neonate complications and mother's NICU stress was not statistically significant ($p>0.05$), due to skewing among sub-scales. Conclusions: Maternal NICU stress seems to increase as neonate comorbidity increases, in particular subgroups of infants. Having infants with both respiratory and hematological complications seem to be very stressful for mothers. Future studies with larger samples of specific neonatal complications are needed to develop proper NICU maternal mental health interventions. Acknowledgments: The Department of Pediatrics at the University of Puerto Rico, Medical Sciences Campus, played a pivotal role in making this research initiative a reality through their commitment and efforts over the years.

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## Reclutamiento de Estudiantes de Escuelas Públicas en la Escuela de Medicina de la UPR: Rol de los Clubes de Medicina y Otras Profesiones de la Salud

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Trasfondo: El 46% de los estudiantes admitidos a la Universidad de Puerto Rico (UPR) procede de escuelas públicas. Sin embargo, solamente un 23% logra ser admitido a la Escuela de Medicina de la UPR. Entre los retos que esta población enfrenta se encuentran: ser estudiante de primera generación en su familia aspirando a realizar estudios universitarios, poco dominio del idioma inglés y provenir de un trasfondo económicamente desaventajado. El Centro Hispano de Excelencia de la Escuela de Medicina, ha desarrollado estrategias de reclutamiento para reducir estas disparidades a través de la implementación de Clubes de Medicina y Otras Profesiones de la Salud (CMPS) en escuelas superiores públicas a nivel isla. Objetivo: Promover el interés en realizar estudios de medicina y salud en estudiantes de trasfondos desaventajados y aumentar el número de estudiantes procedentes de escuelas públicas en la Escuela de Medicina de la UPR. Método: Se analizaron los datos de los informes administrativos del período 2019-2024 utilizando un enfoque descriptivo. Resultados: Los CMPS impactaron 606 estudiantes con las siguientes características sociodemográficas: 21% se autoidentificaron como negros o afrocaribeños, 45% de procedencia rural, 48% con ingresos bajo el nivel de pobreza, y 30% sin acceso a clínicas/hospitales en su pueblo de residencia. 92% del total de estudiantes reclutados estaban interesados únicamente en realizar estudios de medicina. Durante el periodo

analizado se graduaron 187 estudiantes, de los cuales el 95% obtuvo admisión a la UPR. De estos, el 81% en programas de ciencias naturales con la intención solicitar admisión a medicina y/o estudios graduados en salud. Conclusión: Los CMPS han sido exitosos promoviendo el interés en medicina y profesiones de la salud en estudiantes de escuelas públicas y trasfondos desaventajados. Sin embargo, es necesario continuar desarrollando estrategias de reclutamiento para facilitar la admisión exitosa de esta población a la Escuela de Medicina. Afiliaciones: El Centro Hispano de Excelencia es subvencionado por la Administración de Recursos y Servicios de Salud (HRSA, por sus siglas en inglés) del Departamento de Salud de los Estados Unidos, Grant No. D34HP24463.

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### Improving Immunizations Compliance In The Neonatal Intensive Care Unit: A Qi Project.

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Background: Infants in the Neonatal Intensive Care Unit (NICU) are at high risk of delayed immunization. The American Academy of Pediatrics recommends that medically stable preterm and low birth weight infants begin routine immunizations at two months of age regardless of gestational age or birth weight. High immunization rates are theoretically attainable in the NICU, where infants have access to healthcare. Our objective was to improve compliance with these immunizations. Methods: We used the Plan Do Study Act method for quality improvement. We established routine immunization baseline data by reviewing immunization records of infants admitted to the University Pediatric Hospital NICU in 2018. A survey was completed by key personnel to understand the steps required for infants' immunization. The most common reason for non-compliance was the infant's medical critical state. In infants medically stable, physician unawareness of immunization status was identified as a potential area for improvement. In 2019, a vaccine reminder was added to the physician's hand-off document. A run chart was used to plot the monthly number of infants who were already immunized. No audits were performed in 2020-2022 due to COVID-19 restrictions. IRB approved. Results: Audits included 402 infants. Baseline data showed a 33% compliance with immunizations. The number of infants who had at least one set of vaccines was 29% in 2018, 47% in 2019, and 55% in 2023. There was a significant increase in the immunization rate after the intervention. Pre-intervention immunization rate was 31%, and post-intervention was 51% ($p<0.01$). Conclusions: The intervention studied was successful in improving immunization rates in the NICU. This is an example of a simple intervention that can have significant results. The next step is to implement an intervention to address the parents' consenting process, identified as another improvement opportunity.

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### Essential Voice Tremor Progression to Parkinson's Disease: A Systematic Review

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Introduction: Essential Voice Tremor (EVT) is a condition characterized by involuntary rhythmic oscillations of the larynx, resulting in voice tremors. While EVT is often considered a benign and isolated symptom, recent research suggests a potential progression to Parkinson's Disease (PD). This systematic review and meta-analysis aim to elucidate the relationship between EVT and the subsequent development of PD. Methods: PubMed, Scopus, and Cochrane were utilized to identify relevant literature from the inception of the database to August 2023. The criteria used to select studies involved examining patients treated with EVT and their progression to PD over time. Both observational studies and clinical trials were considered. The main outcomes were the incidence of PD development and the time for patients initially diagnosed with EVT. Studies that solely focused on other forms of tremors or PD without prior EVT were excluded.

Results: Of the 2456 article screens, four studies met the inclusion criteria. 102 patients were identified with essential voice tremors that progressed to PD. Of the studies that reported gender, the proportion of female patients was 48.6% ([95%CI: 40.5% to 56.7%]). Patients had a mean (SD) of 21.94 (13.2) years from the onset of EVT to being diagnosed with PD. In addition to EVT, 54 patients reported having long-term action tremors in the upper extremities. Conclusion: The findings of this systematic review and meta-analysis highlight a possible link between EVT and the development of PD. These results underscore the importance of close monitoring and early intervention strategies for patients with EVT, considering the potential for PD progression. More prospective studies are needed to characterize this relationship further.

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### Discovery and Development of Anxiolytic Agents from Tropical Marine Macroalgae

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Background & Objectives: Surveys show that one-third of the population is affected by an anxiety disorder. These are mostly treated with benzodiazepines which can induce dependence disorders through tolerance and resistance mechanisms. This highlights the need for safer and more effective anxiolytic drugs. Recently, marine natural products have proven to be a rich chemical space for drug discovery and development. Specifically, tropical marine brown algae produce a wide range of metabolites with diverse biological activity, including neuroprotection. We propose to study the anxiolytic effects of natural products derived from tropical marine algae using *Drosophila melanogaster* as a model. Our research aims to chemically characterize macroalgae and microalgae extracts (with an emphasis on brown algae), use them for anxiety-related behavioral tests, and identify the chemical components responsible for anxiolytic activity. Methods: The methodology consists of performing Open Field Tests (OFT) using young adult flies to compare the behavior between the control and experimental groups after acute (6 hours) and chronic exposures (oviposition to adulthood) to algae extracts. The parameter measured was the distance each fly traveled from the center of the Open Field Arena to the walls. Results: We have previously reported anxiolytic effects in *Drosophila* after chronic exposure to the crude organic extract of *Stypopodium zonale* using OFT. Statistically significant anxiolytic effects were also obtained for *Dictyota cervicornis*, *Padina boergesenii*, and *Symploca* in chronic exposures, although no anxiolytic effects were observed for *Ulva* and *Sargassum sp*. Recent data has proven that the crude organic extracts from *Stypopodium zonale* and *Padina boergesenii* exhibited anxiolytic effects in acute exposures that are comparable to the effect of diazepam, a benzodiazepine used as our positive control. Conclusions: Our research represents an unprecedented approach to anxiolytic drug discovery as it improves our understanding of Puerto Rico's marine algae and their natural products' chemo-diversity. Acknowledgements: This research has been funded by: Puerto Rico Science, Technology, and Research Trust CATALYZER Grant, Interdisciplinary Research Institute – UPR Cayey, PR-LSAMP, and U-RISE.

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### Association between Perceived Discrimination and Depressive Symptoms among Young Adults in Puerto Rico

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Background & Objectives: Everyday experiences of unfair treatment, known as perceived discrimination (PD), have been negatively associated with adverse mental health outcomes like depression symptoms. Given the socio-political and environmental stressors in Puerto Rico, PD may exacerbate the burden of mental health of young adults. However, there is scarce data on this younger population. This study examined the association between PD and depression symptoms among young adults. Methods: A cross-sectional analysis of baseline data from the PR-OUTLOOK study (September 2020-November 2023) was performed. A total of 2,782 young adults aged 18-29 (61.2% women), recruited via a community-based approach, completed an online survey. PD was measured with a modified version of the Everyday Discrimination Scale, assessing the frequency of eight discriminatory experiences in everyday life. Scores were classified as 0 (no discrimination), 1-6 (moderate discrimination), and 7-40 (high discrimination). Depression symptoms were measured with the self-reported 10-item Center for Epidemiological Studies Depression (CESD-10) Scale, with scores ≥10 indicating the presence of elevated depression symptoms. Poisson regression with robust variance was used to estimate the prevalence ratios (PR) of depression symptoms, adjusting for age, gender identification, sexual orientation, educational attainment, marital status, subjective social status, and social support. The study was approved by the UPR-MSC IRB (protocol # 2310152530). Results: Nearly half of the participants (59.5%) reported elevated depression symptoms, and 40.2% and 45.8% experienced moderate and high discrimination, respectively. Young adults who experienced moderate and high discrimination had significantly higher odds of elevated depression symptoms (PR=1.64, 95% CI=1.41, 1.92; PR=2.33, 95% CI=2.01, 2.70; respectively) than those who did not. The association remained significant after adjusting for covariates (PR=1.57, 95% CI=1.34, 1.82; PR=2.02, 95% CI=1.74, 2.34; respectively). Conclusion: PD was associated with elevated depression symptoms among young adults. Tailored to young adults, public health interventions need to be put in place to reduce the burden of adverse mental health outcomes on the island. Acknowledgment: This work has been supported by the National Heart, Lung, and Blood Institute (grant R01HL149119) and partially supported by the Hispanic Alliance for Clinical and Translational Research (NIGMS U54GM133807).

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### Glymphatic pathway in *Xenopus tropicalis*

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Background & Objectives: Understanding cerebrospinal fluid (CSF) circulation in the brain, especially during embryonic development, remains challenging due to the inaccessible cranial vault. In adult brains, glial cells and the para-vascular space have recently been proposed to form a pathway for CSF excretion called the glymphatic pathway. However, it is unknown how this system impacts CSF circulation during development. Methods: Transparent *Xenopus* tadpoles were used to visualize neurodevelopment in real time due to easy access to the CNS. We injected fluorescent-labeled albumin into the ventricular space and tracked the CSF circulation at 1,2,3 and 24 hours after the injection. Simultaneously, albumin was also injected into the tadpoles' hearts to delineate the CSF and cardiovascular pathways for better tracking. Finally, the heart and the lymphatic pumps were removed to examine their direct influence on CSF circulation and drainage. Approved by IACUC (2021-20410). Results: In *Xenopus* tadpoles CSF did not use the vascular routes to drain, as tracers in the ventricles and heart did not overlap. Interestingly, the ablation of the heart and the lymphatic pump did not immediately impact the CSF clearance from the brain, suggesting additional forces in play. Conclusion: *Xenopus* is the first genetically tractable small animal model to study the glymphatic pathway in real-time. During the early stages of development, the brain establishes a comprehensive path for CSF drainage independent of cardiac and lymphatic forces. Further exploration of the role of this embryonic glymphatic pathway in brain development and its potential implications for congenital hydrocephalus remains a compelling avenue for investigation. Acknowledgements: Special thanks to Dr. Engin Deniz for believing in my potential,

for his mentorship and encouragement that pushed me beyond my limits. To Stephen Viviano, for his willingness to invest time and effort in nurturing my skills. Project was supported by Novartis and Yale School of Medicine Summer Research Program.

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## Revolutionizing Cell Culture: The Effects of Alternative Media Supplementation on SH-SY5Y Cell Proliferation and Viability.

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Background and objectives: Neurodegenerative diseases, including Parkinson's Disease (PD), pose a significant global burden. PD involves the progressive deterioration of motor and non-motor bodily functions, related to the loss of dopaminergic neurons and the presence of alpha-synuclein (α-Syn) aggregates known as Lewy Bodies in the substantia nigra. SH-SY5Y human neuroblastoma cells are widely used as cellular models for studying α-Syn pathologies due to their ability to differentiate into neurons, which allows the investigation of impaired dopamine metabolism. However, these cells are sensitive to environmental changes and exhibit slow proliferation. The conventional culture method involves DMEM F12 media + 10% FBS (fetal bovine serum). In this study, we analyze the potential benefits of NuSerum (NuS), a low-protein alternative serum, as a substitute for traditional culture methods in promoting cell proliferation and differentiation. Methods: The study's design involved culturing SH-SY5Y cells in serum-free DMEM F12, DMEM F12 +10% FBS and DMEM F12 + 10% NuS media. Cell counting assays were conducted on days 2, 4, and 6 after plating, with brightfield microscopy and imaging done on those days. Cell proliferation assessment was done using WST-1 reagent on days 1 through 4 after cell plating. Results: The results consistently demonstrated that the NuS-treated groups exhibited higher cell numbers, increased variability, and accelerated morphological development compared to FBS-treated and serum-free groups. Conclusions: The preliminary data suggests that NuSerum could serve as a suitable serum alternative in SH-SY5Y cell culture, offering an advantage in proliferation, viability, and morphology. Implementing NuS to cell culture protocols may contribute to better cell health, potentially influencing the quality of research and enhancing the reliability of findings in studies using the SH-SY5Y cell line.

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## Targeting matrix metalloproteinase-3 (MMP-3) in high-grade serous ovarian cancer

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Background and objectives: High-Grade Serous Ovarian Cancer (HGSOC) is the most aggressive and lethal gynecological malignancy. Surgery and chemotherapy (with platinum compounds) are the main treatments. Many patients relapse and develop chemotherapy resistance, limiting the therapeutic utility of these therapies, making it difficult to treat. Cisplatin-resistant ovarian cancer cells upregulate Matrix Metalloproteinase-3. MMP3 is an enzyme involved in active tissue remodeling and extracellular matrix protein breakdown during physiological processes. The structure of MMP3 includes 3 domains: prodomain, catalytic and hemopexin. We showed that MMP3 protein levels are higher in cisplatin resistant as compared with cisplatin sensitive HGSOC cells. Our team showed that small interference RNA (siRNA)-mediated MMP3 knockdown reduced cisplatin-resistant HGSOC cell growth and invasion. This data indicates that MMP3 may be a promising HGSOC treatment target. Targeting MMP3 with small chemical inhibitors (SCI) could represent a better option than siRNA because SCI are more stable. Our objective is to design SCI of MMP3 in the propeptide, catalytic, and hemopexin domains. We used in silico methods to identify MMP3 inhibitors in these domains. Method: The ZINC20 database of 370,000 compounds was used for virtual screening using Python Prescription (PyRx) software.

SwissADME was then used to evaluate absorption, distribution, metabolism, pharmacokinetics, drug-likeliness, and medicinal chemistry. Results: We identified 3,700 ligands out of 370,000 with the greatest affinity for each MMP3 domains. From the 3,700 that were analyzed through SwissADME we determined the 25 ligands with the best affinity and pharmacokinetics for each of the 3 domains. Conclusion: This research lays the groundwork for HGSOC therapeutic strategies to improve treatment efficacy, especially for chemotherapy resistant patients. Acknowledgements: We would like to acknowledge the biochemistry department of the UPR Medical Sciences Campus, the UPR Comprehensive Cancer Center and the G-RISE (1T32GM14840601) and The Puerto Rico Department of Economic Development and Commerce.

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### Changes in Skeletal Muscle Metabolic Profile and Physiology after Spinal Cord Injury and Tamoxifen Treatment

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Background & Objectives: Treating spinal cord injuries (SCI) come with a series of challenges since it is a condition for which no cure is available. Severe symptoms can be observed in SCI patients, including somatosensory deficits, chronic pain, muscle mass reduction and loss of movement. Tamoxifen (TAM), a selective estrogen receptor modulator demonstrated beneficial effects in the spinal cord. However, the effect of TAM in skeletal muscle is unknown and this should be established because nerve regeneration and cell survival after SCI is hopeless if muscle deterioration is beyond repair. We hypothesize that administration of TAM after SCI will maintain the metabolite profile similar to the sham group in skeletal muscles and increase the expression of myosin heavy chain (MHC) in these muscles. This study sought to elucidate important changes in skeletal muscle physiology after SCI and TAM treatment. Methods: Female rats received a moderate contusion and control group had only laminectomy, animals from both groups received either TAM or placebo pellets and hindlimbs muscles extracted at 28 days post injury, to which metabolomic analysis and western blot were performed. IACUC Approved: 2450121. Date: 6/22/2023. Results: Metabolic multivariate and univariate analyses showed changes after SCI related to purine metabolism, and exhibit that the treatment with TAM had favorable metabolic changes in skeletal muscle (p-values: 5.27-10 and 9.31-07, respectively). Western Blot analysis revealed downregulated levels of MHC in skeletal muscle after SCI (n= 3, $p<0.0045$). Conclusions: Our results suggest that the treatment with TAM after SCI can revert unfavorable metabolic changes related to purine metabolism and prevent the decrease of MHC expression on skeletal muscle. Acknowledgements: This research was supported by grants from the SC1GM144032, COBRE (P20-GM103642), and the PR Science & Technology Trust (2022-00125).

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### Sex Differences in BDNF Expression in the Extinction of Morphine Place Preference

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Background and Objectives: According to the CDC, 74.8% of drug-related overdoses resulting in death are caused by opioids (CDC, 2022). Addiction is a cognitive disorder of chronic drug-seeking caused by

aberrant learning patterns that induce neuroplasticity damage in the corticomesolimbic reward system. We aim to study the biological basis of extinction of drug seeking through the expression of brain derived neurotrophic factor (BDNF) and its receptor, tropomyosin receptor kinase (TrK-B), in female rats. Results will be compared to previous data in males. Methods: Animals were conditioned to morphine (5mg/kg) by using the conditioned place preference (CPP) paradigm, followed by extinction training. Withdrawal symptoms (rearings, grooming), and exploratory-based anxiety (transitions) were assessed. Western blots were performed to evaluate BDNF and TrK-B expression in the reward system, i.e., the nucleus accumbens (VS/Nac), amygdala (AMY), and hippocampus (HPC). Estrous cycle will also be monitored. IACUC Number: 9940112. Results: Animals exhibited three behavioral phenotypes after morphine CPP: extinction, extinction-resistant, and sham-extinction. However, unlike males, some female shams did not extinguish drug-seeking. When compared to non-extinction shams, extinction trained animals had a higher likability of extinguishing morphine preference. Additionally, extinction training reduced withdrawal-like symptoms in males, but not in females. BDNF in the HPC was upregulated in extinction males and females. Contrastingly, AMY BDNF only increased in males that received extinction training. VS/Nac of males showed no differences in BDNF, whilst a significant increase was observed in extinction females. Lastly, non-phosphorylated Trk-B in females was increased in the VS/Nac of extinction-resistant animals, while in the HPC, no significant differences were observed between groups. Conclusion: Results demonstrate that increased BDNF in the HPC enables morphine extinction; AMY may mediate withdrawal symptoms in males, whereas the VS/NAc may facilitate morphine extinction in females. Support: Supported by: MBRS-SCORE-1SC2DA047809, NIH-NIGMS-1R16GM149491, NIGMS-RISE-R25GM061838 and NeuroID.

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## Epidemiology of Rheumatoid Arthritis during the COVID-19 pandemics in Puerto Rico: Estimates from a government health insurance claims database

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Background & Objectives: Several studies have proposed the COVID-19 as a risk factor for the development of autoimmune inflammatory diseases such as Rheumatoid Arthritis (RA). This study is the first step to understand the association of COVID-19 with RA in Puerto Rico by evaluating the epidemiology of RA during the peak of COVID-19 pandemics. Methods: Patients with a diagnosis of rheumatoid arthritis between January 2018-December 2022 were selected from the Puerto Rico Health Insurance *Administración de Seguros de Salud de Puerto Rico (ASES)* claims database. The International Classification of Diseases-Coding for Rheumatoid Arthritis (9th and 10th Eds) were used for case detection. Cases by sex, age and geographic distribution were evaluated. IRB approval No. EMSJBIRB-4-2023. Results: A mean of 9,262 cases/year was identified during the 4-year study period. We found mean prevalence of 7.6 per 1,000. Prevalence by sex was 6.3 per 1,000 women and 1.3 per 1,000 in male. A slight increase in total RA cases was noted during the peak of COVID-19 pandemics (2021-2022). Evaluation by age showed peak prevalence at 51-60 years. Geographical data showed that the metro-north region had the greatest count of cases, with a mean of 1,754 and the municipality of San Juan had the most with a mean of 630. Conclusions: The demographic profile of RA in Puerto Rico during the COVID pandemics presents a patient in the mid-to advanced age and mostly female residing in the metro-north region. Prevalence showed to be greater and younger than reported globally and in Puerto Rico before the COVID-19 pandemics. The increase in RA cases during the peak of COVID-19 pandemics may suggest an association of COVID-19 with the development of RA which will be further investigated.

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## TWIST1 and Mutants Binding Analysis by SELEX-seq

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Background & Objectives: The *TWIST1* gene encodes for a class II member of the basic Helix-Loop-Helix (bHLH) family of transcription factors expressed in early mammalian development which is essential for mesoderm organogenesis and craniofacial development. As a transcription factor it recognizes the E-boxes containing the consensus sequence 5'- CANNTG - 3'. TWIST1 binds DNA as a dimer to regulate genes like Bone Sialoprotein (BSP), Osteocalcin (OC), Fibroblast Growth Factor Receptor-2 (FGFR2) and Periostin (POSTN). Mutations in TWIST1 have shown to cause the autosomal dominant syndromes Saethre–Chotzen (MIM: 101400), Sweeney-Cox (MIM: 617746 Syndromes, Craniosynostosis 1 (MIM:123100) and Robinow-Sorauf syndrome (MIM:180750). Methods: We tested the hypothesis that wild type TWIST1 and selected DNA binding domain mutants (p.Arg116Leu, p.Arg118His, p.Arg118Leu, p.Glu117Gly and p.Glu117Val) found in patients may bind novel sequences in the genome using SELEX-seq. The R SELEX package from Bioconductor and the Top-Down Crawl method were used to determine cognate binding sites for TWIST1 wildtype and mutants. Results: Position weight matrixes from the Top-Down Crawl method gave sequences for TWIST1 Homodimer of GACCTG, while heterodimers with E12 preferred CAGTTG. Other novel sequences similar to E-boxes were bound by the different mutants (Homodimers: R118L: CACCTG; R118H: CACCTG; R116L: CAGTGT; E117V: CAGTGT; E117G: CATACTG, Heterodimers with E12 preferred sequences: R118L: TGTCTG; R118H: ACACTG; E117V: CAGGTG; E117G: CAGATG; R116L: CAGTGT). While the first two E-box bases (CA) were preferred in some mutants, the position weight matrixes always show a high affinity for TG at the end of the sequences in the wild type and every mutant tested. Homodimers of severe mutants like E117G showed a lower affinity for the E-box variable bases in the middle. Conclusions: ChIP-Seq and DNA binding assays are needed to determine whether these findings are confirmed for TWIST1 and its mutants when they bind to their target sequences *in vivo*. Acknowledgements: This research was supported by NIH grants SC1GM139706 and U54MD007600

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## Left neck soft tissue swelling and pain in a 4-year-old girl secondary to esophageal perforation: a case report.

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Introduction/Objectives: Esophageal perforation in children is a rare life-threatening condition that accounts for 30-40% of mortality rate requiring prompt diagnosis and intervention in the Emergency Department (ED). Due to anatomical location of the esophagus, the presentation and diagnosis are often challenging. Pediatric esophageal perforation most commonly occurs secondary to chest/neck blunt injury, nasogastric tube insertion (NGT), endotracheal intubation, caustic ingestion, foreign body ingestion, and endoscopy-related procedures. Early recognition, diagnosis and treatment reduce complications and mortality rates. Case Report: Case of four-year old girl who presented with moderate left neck swelling and pain without associated symptoms. Mom denied trauma, foreign body ingestion or recent instrumentation. Initial vital signs were adequate for age. Physical exam noted moderate swelling of the left aspect of neck without crepitus, airway compromise or evidence of trauma. Plain radiographs and CT of neck, chest and abdomen revealed extensive subcutaneous emphysema and pneumomediastinum requiring transfer to Pediatric University Hospital with suspicion of airway versus esophageal injury. At the Pediatric ED, patient rapidly deteriorated for which was intubated and started on IV antibiotics. Upon PICU stay, patient hemodynamical status compromised requiring vasopressors and surgical intervention by ENT service which performed a transcervical neck exploration with incision and drainage of brownish discharge along

with esophagoscopy. Esophagoscopy uncovered an esophageal perforation which was left to heal by primary intention and NGT insertion. After two weeks of IV antibiotics, hemodynamical support and PICU care, patient recovered from mediastinitis and septic shock secondary to esophageal perforation of unknown origin. Patient safely discharged home after 32 days of inpatient medical care. Conclusions: Rapid recognition of esophageal perforation and complications remains challenging in the ED, emphasizing the critical importance of suspicion, early diagnosis, and treatment. Clinical presentation can be subtle and nonspecific during initial stages. Early hemodynamic support and multidisciplinary approach are key to decrease complications and mortality rate.

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### Spontaneous Intracerebral Hemorrhage In The Setting Of Severe Thrombocytopenia

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Background: Spontaneous intracerebral hemorrhage (ICH) is a rare, but life-threatening complication of severe thrombocytopenia, which carries a high mortality and morbidity rate. Case Description: A previously healthy, 20-year-old male presented with right-sided neck swelling, weight loss, decreased appetite, and low-grade fevers for 2 weeks. Physical examination revealed right-sided cervical lymphadenopathy without organomegaly. Laboratory testing showed leukopenia with lymphopenia, and platelets of 138,000/uL. The chest X-ray was normal and was discharged home with a presumed diagnosis of reactive lymphadenopathy and bone marrow suppression due to viral illness. The patient returned 5 days later due to rash, gum bleeding, and worsening thrombocytopenia. Laboratory testing showed WBC of 1,850/uL, mild neutropenia and lymphopenia, hemoglobin of 13.7 g/dL, platelets < 5,000/uL. CT scans of the neck, chest, abdomen, and pelvis were only significant for few prominent lymph nodes throughout the deep cervical spaces. Additional testing included normal PT and fibrinogen, prolonged PTT (43 sec, NL 23.2 to 31.9 secs), d-dimer of 1.27 mgFEU/L (NL < 0.59), normal electrolytes and liver enzymes, negative C-reactive protein, and ferritin of 425.9 ng/mL (NL 22-322). Autoimmune and infectious workups were negative. Bone marrow biopsy showed decreased cellularity (<15%) and no malignancy. The patient developed hematuria and acute neurological deterioration ~ 24 hours after admission and urgent brain CT showed a large left temporal hematoma with mass effect, vasogenic edema, and midline shift. As the patient remained refractory to platelet transfusions, recombinant factor VIIa and high-dose steroids were administered, and a bedside ventriculostomy was done without clinical improvement. These events led to brain death attributed to spontaneous ICH secondary to severe thrombocytopenia. The etiology of his rapid deterioration remains unclear. Conclusion: This case reinforces the importance of recognizing and addressing thrombocytopenia-related complications promptly and the challenges of managing bleeding in a patient refractory to platelet transfusions. Acknowledgments: None

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### Enfoque Multidisciplinario en un Caso del Programa de Ortodoncia RCM-UPR

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Propósito: La Clínica Craneofacial del Departamento de Ortodoncia del UPR-RCM se fundó en 1997, con el fin de ofrecer un tratamiento multidisciplinario, a pacientes que presentan diferentes condiciones craneofaciales. El propósito de este proyecto fue el describir la experiencia de tratamiento multidisciplinario de un paciente en la clínica craneofacial y el rol de cada especialista. Descripción del Caso: Paciente de 22 años de edad, residente de Añasco, Puerto Rico, que presenta una reparación bilateral de labio y paladar fisurado con hipoplasia

maxilar e hiperplasia mandibular. El paciente fue entrevistado y refiere haber recibido consulta y tratamiento por 11 especialistas en el RCM-UPR por un periodo de 14 años. Algunos de los especialistas son Ortodoncia, Cirugía Plástica, Cirugía Maxilofacial, ENT, Psicología, Pediatría, Odontopediatría, Nutrición, Fonología, Audiología y Medicina Genética. El mismo continua con un plan de tratamiento de ortodoncia en la clínica. El paciente tuvo su primera cirugía a los 3 meses de nacido y quedó pendiente a un procedimiento de cirugía plástica. Al momento de preguntar al paciente sobre su experiencia recibiendo tratamiento en el UPR-RCM, expresó agradecimiento ya que ha podido encontrar todas las especialidades necesarias en un solo lugar ayudando cumplir su meta. El paciente mencionó que el tratamiento multidisciplinario ha sido exitoso a través de su mejoraría funcional y estética. Conclusión: La clínica craneofacial ofrece tratamientos multidisciplinarios en el RCM-UPR, reuniendo especialistas que colaboran en un solo lugar para facilitar el acceso a la alta población de pacientes craneofaciales en Puerto Rico, con el propósito de mejorar su calidad de vida. Agradecimientos: Agradecemos a todos los doctores del RCM-UPR que fueron partícipes en este proyecto.

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### Elevated blood pressure and obesity among pediatric population in Puerto Rico after COVID-19 pandemic lockdown

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Background: Childhood obesity is a serious, long-term public health challenge and one that has been impacted by the Covid-19 pandemic. The CDC found that the increase rate in body mass index (BMI) among ages 2-19 doubled during the pandemic.1 Obese children are at increased risk for hypertension. In addition, the risk of hypertension increases across the entire range of BMI values.2 This study will provide an overview of obesity and abnormal blood pressure rates before and after COVID-19 in pediatric patients. Methods: Data was collected from electronic medical records at three pediatric primary care offices. Data included: sex, age, health insurance, weight, height, and blood pressure measurements. Time period established as the last visit prior to lockdown and first visit after school re-opened. Exclusion criteria: Patient on medications for blood pressure, prematurity (<32 wga), age less than 10 years and chronic disease. A mixed model controlling for the effect of clinics will be used to analyze the data, along with chi square, 95% CI and p value<0.05. Results: Sample size was 60. Population characteristics showed 55% female. Most of the patients had government funded insurance (90%). Despite no difference in BMI category, there was significant difference in pre and post weight (p=0.0085, SD 18-19, 95% CI: 2.4-16.4). It was observed that blood pressure was increased in 58% of the population after lockdown, 33% before (p=0.007). Blood pressure categories changed to elevated blood pressure and stage 1 after lockdown. Conclusion: This study suggests that after COVID 19 pandemic patients had an increase in BMI, weight, and abnormal blood pressure. Further statistical analysis is being done to correlate these two. Although there are limitations, the data suggest that in our population there is an increase in weight and blood pressure after COVID lockdown. This study provides a baseline to investigate further this phenomenon in Puerto Rican pediatric patients. Acknowledgement: We do not have any conflict of interest and no disclosures to give for this investigation.

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### Spinal Cord Dysfunction After Surfing: A Case of Surfers Myelopathy

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Purpose: To present the case of a 13-year-old male with acute neurological symptoms after participating in a surfing session, to justify clinical discussion, providing relevant learning, and raising awareness of the condition. Case Description: A previously healthy 13-year-old male patient presented to the emergency

room with acute onset of lower extremities pain, weakness and difficulty walking after participating in his first prolonged surfing session. Symptoms began immediately after the activity and progressed over a few hours. The patient denied trauma. Examination revealed bilateral lower extremities weakness, particularly in the hip flexors and knee extensors. Sensation, reflexes, and coordination were intact. There were no signs of trauma or injury. Imaging studies, such as spinal MRI, revealed abnormal hyperintensity on T2-weight images, particularly in the thoracic spinal cord. Surfer's myelopathy was diagnosed and attributed to hyperextension of the back during the surfing session that likely led to ischemia and injury to the spinal cord. Steroids were administered, improving the pain. A Foley catheter was placed due to inability to urinate, extracting 900mL of urine. He was managed with supportive care and physical therapy to improve strength and coordination. The patient gradually improved over several weeks, with complete resolution of symptoms. Conclusion: The case highlights the importance of considering surfer's myelopathy in patients with neurological symptoms after prolonged surfing sessions. The discussion highlights the relationship between hyperextension during activity and spinal ischemia. Emphasis is placed on clinical aspects, radiological findings, and initial management of the patient. Acknowledgments: We would like to thank the faculty of medicine of the department of radiology for their contributions to establishing diagnosis and implementing patient management.

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### Perioperative Considerations in Adults with Coarctation of the Aorta Undergoing Digital Subtraction Angiography for an Intracranial Artery Aneurysm

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Introduction & Purpose: Coarctation of the aorta (CoA) and bicuspid aortic valves (BAV) are congenital heart malformations related to the incidence of intracranial aneurysms. This case aims to highlight that patients with cardiovascular diseases (CVD) require a thorough pre-operative evaluation, optimization of comorbidities, and an appropriate anesthetic plan to prevent cardiovascular decompensation. Case Description: We present a case of a 34 years-old male patient with American Society of Anesthesiology status 3, with a history of unrepaired CoA, BAV, and hypertension, who underwent a digital subtraction angiography with embolization of a right anterior communicating artery aneurysm. He required a thorough pre-operative cardiology clearance due to his cardiovascular comorbidities. The patient was breathing comfortably in room air with a SpO2 of 88% on the day of the surgery. Due to the urgency, the surgery proceeded as planned under general anesthesia following the cardiologist's recommendations. The medical team administered only 500ml of 0.9% normal saline intra-operatively. The neurosurgery team administered four liters of IV heparinized fluid via the catheter to prevent thrombosis. During emergence, the patient became hypoxemic, failed extubation, and was re-intubated emergently. The medical team stabilized and transferred him to the intensive care unit. Immediate workup revealed elevated Pro-BNP, suggesting decompensated acute heart failure. Despite receiving multidisciplinary management, his respiratory status worsened, which led to a cardiopulmonary arrest that resulted in death. Conclusion: Patients with CVD often undergo endovascular procedures, which usually entail less risk than more invasive open surgeries. Endovascular procedures frequently need continuous heparinized fluid to prevent thrombosis of the catheter. However, excessive irrigation may not be favorable in patients with CVD as it may lead to acute decompensation of the myocardium. The current case report highlights the importance of formulating a multidisciplinary intra-operatory plan between the cardiologist, surgeon, and anesthesiologist for a successful procedure.

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### Peeling Back the Layers: An Imaging-Based Case Report on Two Examples of Acute Aortic Syndrome

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Purpose: Acute aortic syndromes encompass a variety of pathologies with potentially catastrophic outcomes. Rapid recognition and accurate characterization of these injuries and their complications are crucial for effective patient management. Diagnostic imaging represents our primary tool for achieving this objective. Case Presentation: A 74-year-old male was transferred to our institution after a fall from height. An imaging study from the outside hospital reported findings of acute traumatic injury to the aorta. The patient was alert and breathing spontaneously, with intact neurological function and stable vital signs. He reported moderate pain in his head, chest, and left wrist. A CT angiogram performed at our institution revealed a grade III traumatic aortic rupture with pseudoaneurysm formation. Additional findings of hemopericardium, bilateral hemothoraces, mediastinal hematoma, and multiple rib fractures were noted. The patient underwent thoracic endovascular aortic repair. He eventually expired after a prolonged hospital stay. A 61-year-old male was transferred to our institution after suffering a motor vehicle accident. An imaging study from the outside hospital reported findings of aortic outpouchings and dissection, as well as lacerations of the liver and spleen. The patient was alert and breathing spontaneously, with intact neurological function. His vital signs were remarkable for tachycardia and physical exam elicited abdominal tenderness. A CT angiogram performed at our institution revealed two penetrating atherosclerotic ulcers with surrounding mural thrombi and an associated chronic dissection of the descending aorta, with some arterial branches arising from the false lumen. He was managed conservatively with close imaging follow up and he was eventually discharged home. Conclusion: The diagnosis and differentiation of acute aortic syndromes relies on their imaging characteristics, with important repercussions for patient management. This report discusses findings from two specific cases: traumatic aortic injury with pseudoaneurysm formation and penetrating atherosclerotic ulcer with associated aortic dissection. Acknowledgements: None.

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## Atypical Presentation of Nodular Lymphocyte-Predominant Hodgkin Lymphoma (NlphI)

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Introduction: Nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) is a rare subtype, accounting for approximately 5% of all Hodgkin lymphoma cases, with an annual incidence of 0.1 to 0.2 cases per 100,000 people. A key morphologic feature is the presence of lymphocyte-predominant cells, histologically expressing CD20 but usually lacking CD30. Patients commonly present with painless, chronic peripheral lymphadenopathy. However, central lymph node involvement, particularly a mediastinal mass, is atypical, occurring in only 2 to 7% of patients. Case Description: 9-year-old male with history of hypotonia, dermatitis, and asthma, presented to the ER due to redness and swelling of left leg for one month associated with limping. Despite evaluations by multiple specialists, the only notable findings were elevated inflammatory markers. A Rheumatologist evaluation revealed tenderness and erythematous inguinal lymphadenopathy in the left leg, prompting a referral to the ER. Mother denied symptoms of fever, fatigue, night sweats, nausea, vomiting, cough, changes in weight or rhinorrhea, traumas or recent surgeries—no family history of coagulopathy or vascular disorders. Laboratory results indicated mild leukocytosis, thrombocytosis, and slight prolongation of PTT. Patient was admitted with findings concerning for deep vein thrombosis (DVT) vs malignancy vs infection. Imaging, including a lower extremity CT and chest CT, revealed signs concerning for bulky inguinal and mediastinal lymphadenopathy. Bilateral bone marrow biopsies yielded negative results. Ultimately, an excisional

biopsy confirmed the diagnosis of NLPHL, with expression of CD30+ markers. A PET CT indicated advanced stage III disease due to involvement of supra- and infra-diaphragmatic lymph nodes. Conclusion: NLPHL can present with atypical signs and symptoms and may be diagnosed at advanced stages despite the majority of patients presenting in early stages (~75%). In comparison to early-stage diagnosis, patients with advanced disease at diagnosis tend to relapse either with NLPHL histology or with transformation into aggressive B-cell non-Hodgkin lymphoma.

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### Combination of Wide-Awake Local Anesthetic No Tourniquet (WALANT) and Sedation Proves Effective for Hand Surgery in Five Pediatric Patients

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Introduction & Purpose: The Wide-Awake Local Anesthetic No Tourniquet (WALANT) technique has become popular due to its simplicity, safety, and efficacy. The approach is based on injecting low concentrations of lidocaine and epinephrine into the target area, achieving analgesia without sedation. This case series aims to demonstrate that the WALANT technique is a feasible alternative in children. Case Description: We present a case series of five patients between the ages of 8- and 16 years undergoing hand surgery utilizing the WALANT technique with adjunctive sedation. The pediatric population is usually less cooperative and more anxious than the adult population during surgical procedures. Thus, the WALANT use in the pediatric population may pose a challenge. To minimize this obstacle, we pre-medicated the children with midazolam (2-5mg IV) and administered a combination of ketamine (25- or 50mg IV) and dexmedetomidine (IV) for the surgeries. In four patients, the dexmedetomidine was used as a continuous drip through the surgery with a loading dose ranging from a one-time bolus of 30 mcg or 0.5 mcg/kg/hr or 2.0 mcg/kg over 10 minutes. The medical team administered a one-time bolus of 12 mcg IV to the fifth patient. Doses varied depending on the patient's characteristics and the clinical judgment of the anesthesiologist. The procedures finished without surgical or anesthetic complications. Conclusion: The WALANT technique with sedation was used successfully in all five pediatric patients. The patients cooperated and gave the surgeon positive feedback during the procedure. Furthermore, the patients needed no opioids for the postoperative pain. The extreme satisfaction of the patient and lack of complications may be secondary to the absence of the tourniquet. Therefore, the WALANT technique in pediatric hand surgery proves to be a practical, viable, and beneficial approach to have less postoperative pain and complications and to achieve a successful intervention.

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### HIV/AIDS as Mimicker of IBD

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Purpose: The purpose of this case report is to increase awareness regarding the crucial need for a comprehensive evaluation, incorporating HIV/AIDS as a potential differential diagnosis in the context of suspected IBD, given its potential to be mistaken for other diseases. Case presentation: This case involves a 19-year-old male with no prior medical history, initially assessed in our Emergency Department (ED) for a three-week history of abdominal pain, watery diarrhea, weight loss, and anemia. Despite elevated inflammatory markers and a clinical presentation indicative of possible IBD, subsequent EGD/colonoscopy revealed only gastritis, with a normal colon and normal findings at terminal ileum. One year later, the patient returned to the ED experiencing episodes of dark stool progressing to bright red bloody diarrhea, accompanied by lower abdominal pain, fever, tachycardia, fatigue, and unexplained weight loss. This prompted a reevaluation with IBD as the primary differential diagnosis. Colonoscopy

confirmed recent CT enterography findings of proctitis, while EGD revealed characteristics of esophageal candidiasis. This led to a more detailed infectious disease workup, as esophageal candidiasis is typically associated with immunocompromised states and is an AIDS defining disease. Subsequent evaluation revealed HIV infection in this sexually active teenager, along with a diagnosis of disseminated Mycobacterium Avium Complex (MAC), which can mimic IBD in the context of AIDS. Conclusion: This case underscores the importance of conducting thorough history and HEADS examinations in suspected IBD cases, as well as comprehensive workups for sexually active patients, enabling the identification of potential HIV-vulnerable populations and facilitating prompt treatment interventions. Acknowledgment: No conflict of interests, or financial support to report.

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### Invasive Trichosporinosis in the Immunocompromised

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Introduction: Trichosporum ssp. are associated with opportunistic infection in immunocompromised patients. Risk factors associated with infection include antibiotic use, chemotherapy, and catheter devices. Invasive infection is associated with a mortality rate as high as 90%. Treatment has become difficult in the setting of emerging resistance to azoles. Case presentation: 2-year-old female with history of Trisomy 21, VSD, ASD and Acute Myelogenous Leukemia (AML) admitted to the Oncology ward due to severe neutropenia. Patient had just completed her chemotherapy induction cycle when she presented with persistent fever events associated with severe neutropenia (ANC 0-50 initially). Upon evaluation, patient looked acutely ill, with generalized erythematous papules and pustular skin lesions. Both peripheral and Medport blood cultures revealed yeast species. Case was consulted to the Infectious disease service due to fungemia in the setting of prolonged central IV access and despite being on Caspofungin. Antifungal was later optimized to Fluconazole, and recommendations were made to discontinue Meropenem and Vancomycin. Final blood cultures revealed the presence of Throchosporon Asahii. On the third day of disease, patient clinically deteriorated presenting with grunting and episodes of desaturation, for which fluconazole was discontinued and dual therapy was started with Voriconazole and liposomal Amphotericin B. Lock therapy with Amphotericin was also started to decrease fungal load until removal of Medport. Surgery service removed Medport, but patient remained clinically unstable with persistent daily high-grade fevers. Chest and abdominopelvic CT imaging were ordered to rule out fungus lesions, showing disseminated fungal infection, with randomly distributed military pattern nodules on bilateral lungs, pericardial effusion, thyroid lesions, spleen/kidney involvement as well as intramuscular lesions (thighs and gluteal) concerning for microabscesses. Conclusion: Thricosporinosis is a potentially life-threatening infection in the setting of neutropenia and central venous access. The use of prophylactic antifungals may further increase risk by altering host microbiota. Acknowledgments: None

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### Aneurysmal Bone Cyst (ABC) of the Humerus: Navigating Diagnosis and Intervention

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Purpose: Aneurysmal bone cysts (ABCs) are uncommon tumors of the skeletal system that typically manifest during the initial two decades of life. The origin of these tumors is a subject of debate, with potential factors including vascular, traumatic, or genetic influences. Case description: Our patient is a 28-year-old female with no past medical history who presented with symptoms of arm pain after sustaining a ground level fall 4 days prior. On

physical examination, she had slight increase in circumference of the distal humerus when compared to the contralateral arm, minimally tender to touch without warmth or erythema. Upon radiographs and computed tomography (CT), imaging revealed an eccentric well-defined expansile multi-cameral, lytic lesion arising from the posterior aspect of the distal humerus diaphysis, measuring 8 cm on long. Right humerus mass open biopsy results revealed a benign giant cell rich lesion, favoring an aneurysmal bone cyst. Conclusion: ABCs are now recognized as benign tumors, characterized by expansive and locally destructive lesions within bone tissue. While they predominantly form around the knee, they have the potential to emerge in various regions of both the axial and appendicular skeleton. While often encountered incidentally, symptomatic presentations can prompt the need for intervention, mainly due to the risk of having pathologic fractures. Radiographically, these tumors exhibit a dilated, radiolucent lesion typically situated in the metaphyseal region of the bone. On CT, findings include a well-defined, multiloculated cystic lesion with fluid-fluid levels, thin septations, and involvement of the metaphyseal region, often leading to cortical thinning and bone expansion. The potential for complications, such as pathologic fractures, underscores the significance of prompt diagnosis and intervention. Acknowledgements: Special thanks to Dr. Ivonne Ojeda for her disposition, help and knowledge, the Department of Radiology of the UPR-MSC School of Medicine and to Hospital ASEM for their contributions in diagnosing and providing medical care in their establishment. Conflicts of interest: No financial funds or conflicts of interest to disclose.

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## The crosstalk between the tumor microbiome and epigenomic changes in penile cancer

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Background & objectives: Penile carcer (PeCa) is approximately three times more prevalent in Puerto Rico when compared to other ethnic groups in the United States. Moreover, the mortality rate among Puerto Rican men is significantly higher when compared to the US population. Infection with human papillomavirus (HPV) has been identified as a risk factor for an average of 48% of PeCa cases in Puerto Rico. To date, the role of the microbiota in the pathogenesis of PeCa is unknown. Furthermore, the role of DNA methylation in PeCa cells that can lead to changes in gene expression and cellular function is also unknown. This study aims to analyze the DNA methylation patterns and microbiota in HPV-positive and HPV-negative PeCa tissues from Puerto Rican men. Methods: DNA was extracted from fresh PeCa samples from Puerto Rican patients. HPV status and genotype were determined using the DNA ELISA kit HPV-SPF10 protocol. DNA methylation was determined using the Infinium Methylation EPIC v2.0 BeadChip Kit to identify and compare DNA methylation levels between HPV-positive and HPV-negative PeCa samples. Microbiota analyses were performed using 16S rRNA genes with the Illumina MiSeq platform. Results: Results demonstrated that 45 loci methylation patterns were significantly different between HPV-positive and HPV-negative samples (adjusted p-value <0.1, Benjamini-Hochberg method). The abundance of Firmicutes, Proteobacteria, Bacteroidetes, Fusobacteria, and Actinobacteria was individually associated with number of affected loci (27, 19, 12, 6, and 3, respectively). Conclusions: We found that HPV status is associated with methylation

and microbiome patterns in Puerto Rican men with PeCa. Both changes may be involved in triggering inflammatory responses and oncogenesis. Our findings demonstrate that methylation patterns and microbiome may be involved in cellular processes linked to PeCa. Acknowledgments: This research was supported by NHI/NCI grant 2U54CA096297-16 U54 UPR/MD Anderson Partnership and start-up funds from the UPR Comprehensive Cancer Center.

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### Synapse Development and Composition after Acute and Chronic Exposure to Alcohol

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Background & Objectives: Alcoholism is an ubiquitous and increasing problem in society. Alcohol provokes changes in the nervous system that underlie changes in behavior and lead to addiction. Understanding the consequences of acute exposure to chronic consumption of alcohol on the nervous system will enable us to decipher the mechanisms leading to addiction. Studies about the effects of alcohol on the nervous system have been prolific, especially alcohol's postsynaptic targets and mechanisms. Meanwhile, the effects on presynaptic proteins have been less studied. Methods: We aimed to identify changes in synaptic morphology and presynaptic protein expression at the Drosophila NMJ after acute and chronic exposure to alcohol. Using immunohistochemistry and confocal and super-resolution microscopy, we characterized the synapse by quantifying synaptic boutons and active zones. We also measured the presence and quantity of essential presynaptic proteins (Syntaxin 1A, Synaptotagmin 1, Synapsin) that are possible molecular targets of alcohol. Results: Acute exposure to alcohol did not affect the synapse nor protein expression. In contrast, chronic treatment impacted synaptic growth and composition. We found that there was a 30% decrease in number of boutons and a 24% decrease in active zones, showing that chronic alcohol exposure can dramatically impact synapse development. In addition, we assessed vesicle proteins and found that Syntaxin 1a increased by 20% and Synaptotagmin 1 increased by 26% after chronic exposure to alcohol. In contrast, this treatment did not affect Synapsin expression, showing that chronic alcohol only provokes the change of a subset of synaptic proteins. Conclusion: Although acute exposure to alcohol does not affect the structure of the Drosophila NMJ, chronic alcohol exposure impacts synaptic growth and presynaptic protein expression. Elucidating how alcohol targets the synapse and presynaptic proteins may provide a mechanism that explains the changes in behavior that may lead to addiction after alcohol exposure. Acknowledgments: This work was supported by the NIH NINDS-R21NS114774 to BM, the NSF HRD-1736019 grants to MV and BM. Confocal and super resolution microscopy was supported by NIH NIGMS COBRE P20GM103642.

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### Deciphering the Impact of Running Exercises on the Gut-Brain Axis: Microbiota, Tryptophan Metabolism, and Brain Health

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Background & Objectives: It is recognized that the gut-brain axis, governed by microbiota and tryptophan (TRP)-derived metabolites like serotonin, exerts a pronounced impact on cognitive function, sociability, and emotional states. Despite the acknowledged positive effects of running on gut and mental health,

the precise role of microbiota in regulating brain TRP metabolism remains elusive. Our study aimed to explore the impact of running exercises on the changes of the gut microbiota synergistic and antagonistic associations coupled with modification of TRP metabolism along the gut-brain axis. Method: In a study involving 20-week-old male C57BL/6J mice (Jackson Lab), randomized into sedentary (SED, n=12) and running (RUN, n=12) groups, approved by IACUC #A660121, we collected feces, blood, hippocampus, and brainstem samples after an 8-week intervention. High-throughput sequencing of the 16S rRNA gene assessed gut microbiota composition. GC/MS and LC/MS-based metabolomics analyzed TRP and its metabolites in the gut, blood, hippocampus, and brainstem. Integrative taxon-function analysis explored associations between microbial taxa, metabolic enzymes, and metabolomics data. A sociability behavioral test in mice was employed to evaluate communication skills and sociability in response to running exercises. Results: A shift in microbiota diversity and reduction of TRP metabolizing capabilities was identified within the RUN group, associated with increased TRP uptake to the hippocampus and brainstem through circulation. This led to enhanced serotonin production in the brainstem and increased transport to the hippocampus, strengthening the cognitive and social abilities of mice in the RUN group. Additionally, the symbiotic association between Romboutsia and Akkermansia muciniphila suggested their potential probiotic function contributing to the modification of the gut microenvironment and influencing TRP transport to the hippocampus and brainstem. Conclusions: Our findings hold promise for developing novel probiotics and microbiota-based approaches in the realm of exercise for neurological diseases, particularly focusing on mental health and overall well-being. Acknowledgment: This research was supported by the NIH/NIGMS-PRINBRE Grant 5P20GM103475.

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## Molecular profile of gastric cancer in Hispanics living in Puerto Rico

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Gastric cancer (GC) is the 4th leading cause of cancer death globally. GC's incidence and mortality rates differ dramatically between racial/ethnic groupings. In the U.S., Hispanics, non-Hispanic Blacks, and Asian or Pacific Islanders are more likely to be diagnosed with GC and have a higher mortality rate than non-Hispanic Whites. Among the Hispanic population living in Puerto Rico (PRH), GC ranks among the top ten leading causes of cancer death. Tumor profiling approaches have resulted in discovering actionable gene alterations; however, descriptive information regarding the genetic mutational landscape of GC tumors from PRH is limited. This study aims to describe the genomic profile of GC tumors in PRH and to identify the most prevalent genetic mutations. We retrospectively examined GC tumor mutational profiles from 106 PRH that underwent NGS testing from 2015 to 2022 (provided by CARIS Life Sciences). We compared PRH GC tumor somatic mutation prevalence to TCGA and the AACR Project GENIE, both available through the cBioPortal for Cancer Genomics. Among the top mutated genes for GC tumors in PRH were TP53 (54.1%, n=85), ARID1A (34.2%, n=73), KMT2D (30.5%, n=82), CDH1 (29.4%, n=85) and ZFHX3 (27.3%, n=55). The most frequent gene amplifications were ERBB2 (7.1%, n=84), KRAS (6.0%, n=84), and CCNE1 (4.9%, n=81). PRH had significantly different mutational frequencies of GC driver genes like TP53, ARID1A, CDH1, and KMT2D compared to other datasets. This study is the first to report PRH GC tumor mutational profiles and compare the mutational frequencies to other non-Hispanic and U.S. mainland Hispanic populations using TCGA and GENIE data sets. Furthermore, our study provides data on the specific mutational landscape for Hispanics with GC and the implications on therapeutic options and clinical outcomes. Developing new treatments for genomically diverse populations requires understanding the most common carcinogenic molecular pathways that affect Hispanics with GC.

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## Vaccine hesitancy among persons with a previous SARS-CoV2 infection in Puerto Rico: findings of the COVID-19 Assessment Study (PR-COAS)

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Background: The beliefs and perceptions about COVID-19 vaccines and boosters have not been fully described among persons with a previous SARS-CoV2 infection living in underserved communities in Puerto Rico. Objectives: To describe perceptions and beliefs about booster vaccination among a cohort of laboratory-confirmed SARS-CoV2 Hispanics living in Puerto Rico. Methods: We analyzed data from a prospective cohort study of 261 persons living in Puerto Rico with laboratory-confirmed SARS-CoV2 infection in 2022. Sociodemographic characteristics and vaccination status and perceptions were collected in the initial interview. Frequency distributions were generated to describe the study characteristics. Results: Of 261 patients recruited, the mean age was 47.9±15.8 years, 206 (79.2%) were women, 56 (21.62%) completed high school, and 260 (98.9%) had health insurance. Most patients believed that 1) the COVID-19 vaccines are secure (60.0%), 2) it is important to receive the vaccine (67.8%), 3) the boosters are essential for their health (64.4%), and 4) they would get vaccinated with all the boosters recommended by the health authorities (58.2%); however, only 33 (13.2%) had received more than three doses of the COVID-19 vaccines. The most common reasons for not receiving the boosters were concerns about the side effects (65.0%), long-term effects of the vaccine (56.0%), and belief that the boosters are not effective against COVID-19 (35.3%). Conclusions: Our preliminary data suggest that despite having a SARS-CoV2 infection and positive beliefs towards the vaccine, a significant proportion of patients are still hesitant to comply with booster recommendations in Puerto Rico. Acknowledgements: This project was supported by awards OT2HL161827 from NIH-NHLB, U54GM133807 from the NIH_GMS, 5S21MD000242, 5S21MD000138 and 2U54MD007587 from NIH-NCMHD. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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## The effects of exposure to dibutyl phthalate and manganese on locomotion in the freshwater prawn Macrobrachium rosenberji

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Background: Anthropogenic activities propitiate accumulation of toxic compounds within freshwater habitats. Crustaceans are a major part of aquatic ecosystems, yet little is known about the sensitivity of their nervous systems to water pollutants. Previous studies concerning the effects of river pollutants on freshwater fauna have focused on the animal's survival response and their capacity to reproduce, and usually in response to high doses or long periods of exposure. However, studies focused on the sub-lethal effects of river pollutants on the animal´s behavior and the integrity of the underlying neural circuitry are lacking. Phthalates and heavy metals have been demonstrated to act as neural disruptors. Methods: Thus, in this study, we looked at behavioral changes following short-term exposure to low (but above EPA standards) concentrations of dibutyl phthalate (DBP) 0.006 ppm

and manganese ($Mn^{2+}$) 0.207 ppm in the freshwater prawn *Macrobrachium rosenbergii*. Parameters of locomotion activity, such as total distance traveled, time spent moving at various speeds, and the pattern of locomotion within a fixed area were assessed. We hypothesized that DBP would increase locomotion activity, because previous observations in our lab have shown that this phthalate can increase aggression, and that heavy metals such as $Mn^{2+}$ would decrease activity. Results: Injection of DBP initially reduced distance traveled, but the effect changed as time progressed, increasing distance travelled 24 hours after the injection. In the case of $Mn^{2+}$, distance travelled did not change initially, but also increased 24 hours after injection. Both contaminants also induced the animals to spend more time away from the walls of their tanks, in comparison to control conditions where they received saline injections. Conclusion: These results suggest that anthropogenic contaminants found in water bodies can affect behavior by increasing total distance traveled and disrupting patterns of locomotion in manners that can have an impact on the animal's survival. Acknowledgements: This work was supported by: NSF HRD-1736019 Puerto Rico Center for Environmental Neuroscience (Cycle II). To everyone who contributed to this project and showed their support for our work. Especially, Dr. María Sosa, Dr. Jonathan Crooke, Dr. Laura Vicente, Marcel González, and Nilsa Rivera. My family for giving me the space to grow as a scientist.

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## Self-reported discrimination in medical settings among Hispanic/Latino gastrointestinal cancer survivors

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Introduction and Objective: Despite significant advances in cancer prevention, early detection, and treatment, discrimination in medical settings (DMS) reported by racial/ethnic minorities has led to disparate cancer outcomes. We aimed to determine which sociodemographic factors are associated with self-reported DMS among Hispanic/Latino gastrointestinal (GI) cancer survivors in Puerto Rico (PR). Methods: We analyzed preliminary data from an ongoing cross-sectional study that examines social determinants of health (SDOH) among GI cancer survivors in PR. As of January 17, 2023, 75 individuals aged ≥ 21 years responded to the survey. Crude and adjusted prevalence odds ratios (POR) with 95% confidence intervals (CI) were used to describe the association between DMS and sociodemographic factors. Results: The participants' mean age was 62.8 ± 11.7 years; 56.0% were women, 77.3% had > 12th grade, and 66.2% reported having an income < $20,000. When analyzing the association between DMS and sociodemographic factors, we observed that sex, age, and education were marginally associated with DMS ($0.05 < p < 0.10$). Participants with ≤ 12th grade were 57% less likely to report discrimination ($POR_{adj}$: 0.43, 95% CI: 0.15-1.25, p=0.12) than those with > 12th grade, after adjusting for age and sex. Similarly, participants aged ≥ 50 were 33% less likely to report discrimination ($POR_{adj}$: 0.67, 95% CI: 0.42-1.09, p=0.11) than those aged < 50 years after adjusting for sex and education. However, after adjusting for age and education, females were 61% more likely to report discrimination ($POR_{adj}$: 1.61, 95% CI: 0.92-2.83, p=0.09) than males. Conclusion: Our preliminary findings show that Hispanic/Latino GI cancer survivors with an education level ≤ 12th grade, < 50 years old, and males report less DMS, similar to findings in other studies. More efforts are needed to evaluate the association between sociodemographic factors and DMS among Hispanic/Latino GI cancer survivors. Acknowledgements: Research supported by an AACR grant, Social Determinants of Health, Grant Number: 23-01-SDoH. Approved by the UPRCCC IRB (IRB # 2023-08-112).

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## Análisis Taxonómico y Funcional de Actinobacterias asociadas a termiteros: Implicaciones biotecnológicas y ambientales

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Transfondo y objetivos: El descubrimiento de actinobacterias con enzimas que degradan la celulosa con alta estabilidad resulta especialmente atractivo para la industria. Estas enzimas pueden mejorar los procesos relacionados con las industrias alimentaria y textil, el desarrollo de combustibles y ayudar en la eliminación de residuos celulósicos, mitigando así la contaminación y la acumulación de biomasa sustancial y así mismo este grupo es reconocido por la producción de agenten antimicrobianos importantes en el campo medio. Nuestros objetivos en esta investigación fueron: 1) Aislar e identificar actinobacterias de nidos de termitas Nasutitermes acajutlae, 2) Evaluar eel potencial antibacteriano y su capacidad para degradar la celulosa. Metodología: Recolectamos un total de 61 aislamientos de muestras tomadas de nidos de termitas arbóreas en cinco lugares diferentes a lo largo de la costa de Puerto Rico, se usaron diferentes medios de cultivos de aislamientos de actinobacterias, Nuestro estudio implicó un análisis taxonómico integral, que abarcó evaluaciones morfológicas, fisiológicas y bioquímicas. Resultados: La mayoría de estos aislados exhibieron una notable actividad antimicrobiana contra hongos y bacterias que se encuentran dentro de estos nidos de termitas. Además, algunos de los aislados mostraron capacidades de degradación de celulosa de moderadas a fuertes. Conclusiones: Estos microorganismos son prometedores para descubrir metabolitos antimicrobianos bioactivos que pueden desempeñar un papel fundamental en el control de organismos oportunistas, como hongos y bacterias. Además, esta investigación no sólo es importante para identificar nuevas especies de actinobacterias, que potencialmente podrían abordar el problema de los organismos resistentes a los medicamentos, sino también para aplicaciones industriales. Agradecimientos: Reconocemos la subvención de la NASA No. 80NSSC20M0052 por su apoyo. A mis mentores por su constante guía y apoyo. A mis compañeros del laboratorio de Simbiosis por su ayuda y disposición. El Departamento de Biología y el RUM por las oportunidades.

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## Comparison of quality of life among underserved patients living with and without Long COVID in Puerto Rico: findings of the COVID-19 Assessment Study (PR-COAS)

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Background: The impact of Long COVID on the quality of life is still undetermined and has not been fully described among underserved populations. Objective: To estimate the impact of Long COVID on the quality of life of a cohort of Hispanics living in Puerto Rico. Methods: We analyzed data from a prospective cohort study of persons living in Puerto Rico with laboratory-confirmed SARS-CoV2 infection in 2022. Sociodemographic characteristics, comorbidities, and quality of life were collected in the initial interview. Health-related quality of life was assessed using the EQ-5D-5L scale, which includes five dimensions: mobility, autonomy, daily activities, pain or discomfort, and anxiety or depression. Chi-square or Fisher's exact test was used to compare the independent domains among patients with and without Long COVID. Results: Of 261 patients recruited, 256 had a SARS-CoV-2 infection at least four weeks before the interview. The mean age was 47.95±15.86 years, 202 (79%) were women,

55 (22%) completed high school, and 214 (87%) had received one COVID-19 booster dose. Three-quarters (75%) had signs and symptoms of Long COVID. Those with Long COVID were more likely to report difficulties with daily activities (24% vs. 9%, p = 0.01), pain or discomfort (52% vs. 17%, p <0.001), and anxiety or depression symptoms (37% vs. 11%, p< 0.001). Conclusions: Our preliminary data suggest a significant impact on the quality of life of patients experiencing Long COVID among Hispanics living in Puerto Rico. Acknowledgements: This project was supported by awards OT2HL161827 from NIH-NHLB, U54GM133807 from the NIH_GMS, 5S21MD000242, 5S21MD000138 and 2U54MD007587 from NIH-NCMHD. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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### Enhancing Health Literacy in Dermatopathology Reports: The Impact of AI Tools, such as ChatGPT, on Patient Understanding and Education of Health Information

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Background: Artificial Intelligence (AI) tools like ChatGPT in healthcare can potentially revolutionize patient comprehension across various medical fields. This review assesses the capacity of AI to simplify complex medical information, focusing on dermatopathology reports, and discusses the broader implications for healthcare communication. Methods: We initiated a project to evaluate ChatGPT's ability to translate intricate dermatopathology reports into language comprehensible at or below a 6th-grade reading level. We applied ChatGPT to standard reports of basal cell carcinoma, psoriasis, and cutaneous T-cell lymphoma, generating summaries that maintained clinical accuracy while enhancing understandability. The project also examined the integration of AI within current regulatory frameworks, including HIPAA, and addressed ethical considerations. Results: Preliminary results indicate that ChatGPT has effectively produced concise summaries that retain essential clinical information. The tool's capacity to tailor the report's complexity based on the patient's literacy level proved instrumental in enhancing patient education. Nevertheless, the study also underscored the importance of conducting regular validation checks to prevent inaccuracies stemming from AI and uphold the integrity of medical advice. While AI can enhance patient-centric care, its deployment necessitates thoughtful consideration of ethical and privacy concerns. The opaque nature of AI, possible biases, and data protection issues mandate rigorous ethical and operational protocols to guarantee responsible technology use in the healthcare sector. Conclusion: Integrating AI tools like ChatGPT into healthcare is a critical step toward enhancing patient engagement and communication. To ensure this integration aligns with the foundational values of medicine, such as empathy and personalized care, robust regulatory frameworks, and ethical guidelines must be established and strictly enforced. This will ensure that the adoption of AI not only revolutionizes healthcare communications but also upholds the trust and welfare of patients. Acknowledgments: None

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### Evaluación De Servicios De Rehabilitación En Personas (21 A 64 Años) Con Accidente Cerebrovascular En Puerto Rico.

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Antecedentes y Objetivos: Los adultos más jóvenes tienen más probabilidades de sobrevivir a un Accidente Cerebrovascular (ACV) y necesitarán servicios de rehabilitación. Este estudio presenta el perfil demográfico, clínico y los referidos a rehabilitación en adultos menores de 65 años con ACV incluidos en el Estudio de Vigilancia Cardiovascular de Puerto Rico (CVSS) desde 2007 al 2017. Describe, además, los desafíos para ofrecer servicios de rehabilitación señalados por una muestra de proveedores de salud en Puerto Rico. Métodos: En este estudio se utilizó un diseño de métodos mixtos. Se analizaron cuantitativamente datos secundarios del CVSS (n=1,444), y el método cualitativo consistió en entrevistas a informantes claves (n=6) en centros de rehabilitación en diferentes regiones de salud de la Isla. Aprobado por el IRB: A3420221. Fecha: 6/30/2021. Resultados: La mayoría de los pacientes son varones (57.6%) con una edad media de 54.9 años y el 33.9% contaba con cobertura de seguro médico público. Los hallazgos sugieren que casi el 90.0% de los adultos jóvenes son dados de alta sin ser referidos a centros de rehabilitación. Los resultados de las entrevistas identificaron desafíos de acceso, como problemas con las agencias de seguros de atención médica, escasez de unidades de rehabilitación adecuadas y pobre educación para pacientes, familias y proveedores de salud. Conclusión: El cuidado en Puerto Rico después de sufrir un ACV no cumple con los estándares de calidad. Es necesario mejorar la disponibilidad y acceso a servicios de rehabilitación en la Isla.

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### Molecular profiling of colorectal cancer in a genetically admixed Hispanic population

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Colorectal cancer (CRC) is the leading cause of cancer-related deaths in Puerto Rico. Tumor profiling techniques have led to the identification of actionable alterations to guide treatment and improve survival in cancer patients. However, comprehensive genetic profiling of colorectal cancer tumors from Hispanics living in Puerto Rico (PRH) has not been performed. Our study aimed at understanding the common CRC carcinogenic molecular pathways that affect PRH. We evaluated the mutational profile of CRC tumors from 218 PRH that underwent NGS testing from 2015 to 2020 (provided by CARIS Precision Oncology Alliance). We estimated the prevalence of somatic mutations of PRH CRC tumors and compared them with those reported in TCGA Pan-Cancer Atlas Clinical Data and the AACR GENIE project. Among the top mutated genes for CRC tumors in PRH were *APC* (81.9%, n=182), *TP53* (75.3%, n=178), *KRAS* (56.2%, n=185), *PIK3CA* (18.0%, n=178) and *SAMD4* (12.6%, n=175). The most frequent gene amplifications were: *CDX2* (20.1%, n=184), *CDKN1B* (6.6%, n=183), and *HNRNPA2B1* (5.4%, n=184). Significant differences in the mutational frequencies of CRC driver genes, such as *APC*, *TP53*, *PIK3CA*, *FBXW7*, *CDX2*, *CDKN1B*, and *HNRNPA2B1*, and actionable genes, such as *KRAS/NRAS*, *BRAF* and for *ERBB2* amplifications, among PRH were observed when compared to the other datasets. The prevalence of MSI tumors for PRH was 2.0%. This is the first study to report the mutational profile of CRC tumors from PRH and describe differences in mutational frequencies when compared to other non-Hispanic and U.S. Hispanic populations using data from TCGA and GENIE. Differences in the prevalence of immunotherapy and targeted associated biomarkers may contribute to the observed disparities in survival and response to therapies. Understanding the most common carcinogenic molecular pathways that affect Hispanics with CRC is crucial to guide research efforts in the development of new therapeutic modalities incorporating genomically diverse populations.

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### Predicción de CASIS mediante Inteligencia Artificial

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Trasfondo y Objetivos: Las Conductas Autolesivas Sin Intención Suicida (CASIS) son un problema de salud mental que afecta entre el 17% al 35% de los estudiantes universitarios (Swannell et al., 2014) y la edad de inicio es comúnmente entre 14-24 años (Rodham & Hawton, 2009). Estas utilizan para autorregular emociones y se asocian a mayor riesgo de suicidio y otros trastornos (Turner et al., 2012). Los objetivos fueron: desarrollar un modelo predictivo para identificación temprana de CASIS en estudiantes utilizando aprendizaje automático; evaluar su capacidad predictiva; y determinar las características más influyentes. Método: Se obtuvo el datasets en un centro de consejería universitario y fue preprocesado con las bibliotecas Pandas y scikit-learn de Python, identificándose 4,956 registros y 81 características, de los cuales se seleccionaron las siete más relevantes. Se trataron valores faltantes y el desequilibrio de clases. Se dividiendo los datos en 80% entrenamiento y 20% prueba. Se entrenó un modelo de aprendizaje automático y se escogieron métricas de recall, precisión y F1 y se ajustaron los hiperparámetros del modelo. Resultados: El Modelo 1 (Support Vector Machine) obtuvo recall de 0.83, precisión de 0.71 y una puntuación F1 de 0.77 con hiperparámetros (C: 37.67; Degree: 3; Gamma: 0.119; y kernel: rbf). En comparación a los otros modelos Random Forest (Recall = 0.76 y Precisión = 0.75); Logistic Regression (Recall = 0.74 y Precisión = 0.75) y KNN (Recall = 0.74 y Precisión = 0.73). Conclusiones: Los modelos exhibieron recall elevados y cumplen con el objetivo principal de minimizar la probabilidad de no identificar a un estudiante con CASIS, sin embargo, el Modelo 1 parece ser la opción más adecuada. Esto se debe a su mayor recall y precisión, reflejando un balance más efectivo y capacidad de identificar verdaderos positivos (88%) y minimizar falsos positivos (71%).

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## Implementation of a Parental Infant Massage Project in A Neonatal Intensive Care in Puerto Rico: A Quality Improvement Initiative.

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Introduction: Massage therapy is a common, low-budget, safe, and efficacious way to encourage neurodevelopment in infants admitted to the Neonatal Intensive Care Units (NICU). Among the multiple, evidenced-based benefits are parental bonding, improved feeding tolerance, weight gain, thermoregulation, and pain control. This project aims to determine the feasibility of developing an infant massage project in our NICU to provide a positive sensory experience with the global aim of promoting neurodevelopmental protection. Methods: We used the Plan Do Study Act method for quality improvement. No baseline data was analyzed as this is a new occurrence. The first cycle included an anonymous needs assessment questionnaire completed by parents (n=33) and NICU personnel (n=37) addressing knowledge and disposition. The next cycle, given to parents and staff, included orientation about the benefits of touch massage. A certified neonatal massage therapist provided backstroke massage to a small group of eligible infants observed by parents. Subsequently, parents massaged their infants under direct supervision. A post-massage questionnaire assessed impressions and perceived readiness to massage their babies with minimal supervision. Results: Parents (100%) and personnel (88%) acknowledged it would be beneficial to begin touch massage. Some personnel (34%) reported fear/anxiety about parental infant touch. A few parents (8%) reported fear of touching the baby, but all showed interest in learning to provide massage. Initially, six parents massaged their babies after training and direct supervision. The intervention was well tolerated by all infants. No complications, concerns, or difficulties were reported. Conclusion: Infant massage therapy is a safe, well-tolerated means of encouraging parental-infant bonding. All trained parents referred willingness and confidence in providing massage. After this pilot group, we feel confident in establishing massage therapy in our NICU. After it is established, we will aim for 25% of our parents to participate in the project in the first 3 months.

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## Yao Syndrome: Unraveling the Enigma of a Complex Autoinflammatory Disease with Autoimmune Inflammatory Disease Mimicry

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Purpose: This case presentation aims to highlight Yao syndrome, a rare autoinflammatory disease characterized by a diverse range of clinical manifestations, including periodic fever, gastrointestinal symptoms, dermatitis, polyarthritis, and sicca symptoms. Of particular significance is its association with a NOD2 gene variants. Understanding Yao syndrome is crucial due to potential overlaps in clinical features with other autoinflammatory syndromes such as familial mediterranean fever and Blau syndrome as well as inflammatory bowel disease and autoimmune rheumatic diseases. Case Description: A 22-year-old female transitioned from pediatric to adult rheumatology care with a provisional diagnosis of autoinflammatory syndrome. From infancy, the patient exhibited a spectrum of symptoms, including eczema, lactose intolerance, arthritis, gastroparesis, sicca symptoms, and recurrent urinary tract infections. Throughout adolescence and adulthood, she endured with persistent polyarthralgia, severe dermatitis, gastroparesis requiring gastrostomy for feeding, cyclic fever episodes, severe xerophthalmia, and recurrent viral infections. Despite numerous hospitalizations and immunosuppressive treatments, her disease remained uncontrolled. Genetic testing performed at 21 years of age revealed a NOD2 variant (c.2104 p.Arg702tpr, variant R675W) associated with Yao syndrome, Blau syndrome, and Crohn's disease. Notably, the presence of sicca symptoms and gastrointestinal involvement prompted the diagnosis of Yao syndrome. Conclusion: This case underscores the importance of recognizing autoinflammatory diseases and the clinical value of genetic testing, particularly in treatment-resistant patients. Moreover, it enhances awareness among healthcare professionals, enabling early and accurate diagnosis and ultimately improving the management of individuals affected by this disorder.

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## Concurrent Dermatomyositis and Systemic Lupus Erythematosus: A Rare Association of Autoimmune Rheumatic Disorders

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Purpose: Dermatomyositis and systemic lupus erythematosus (SLE) are chronic rheumatic diseases that can affect multiple organs and present with overlapping clinical manifestations. The coexistence of dermatomyositis and SLE is encountered rarely in clinical practice. The case presented herein underscores the complexity of autoimmune diseases, as the patient initially presented with dermatomyositis but later developed features of SLE. Case Description: A 40-year-old female with medical history of hypertension, asthma, and morbid obesity developed dermatomyositis characterized by proximal muscle weakness of upper and lower extremities, dysphagia, heliotrope rash, periungual erythema, erythematous skin lesions on the neck and arms, elevated serum aldolase and creatine phosphokinase levels, and positive anti-melanoma differentiation-associated gene 5 (MDA5) antibodies. A skin biopsy confirmed the diagnosis of dermatomyositis. She was treated with high-dose corticosteroids and mycophenolic acid. Initially, she improved, but three months later, she presented with worsening dysphagia and muscle weakness as well as pancytopenia, arthritis, positive antinuclear antibodies (ANA), and C3 and C4 hypocomplementemia consistent with SLE. Rituximab was initiated due to progressive symptoms and overlapping features of dermatomyositis and SLE. She had a remarkable clinical response to this biologic agent with the resolution of most manifestations. Conclusion: Although the coexistence of dermatomyositis and SLE is not common, healthcare providers should maintain a high index of suspicion in patients presenting with atypical symptoms or overlapping features. This

case emphasizes the challenge of managing multiple autoimmune conditions concurrently. The patient's response to a combination of corticosteroids, immunosuppressants, and targeted biologic therapy suggests the importance of a multidisciplinary approach in addressing the diverse clinical manifestations associated with autoimmune diseases.

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### Granulomatosis with Polyangiitis Presenting as Severe Gingival Inflammation and Bleeding

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Purpose: Granulomatosis with polyangiitis (GPA) is a systemic vasculitis primarily affecting small to medium-sized blood vessels. This condition commonly involves the upper and lower respiratory tracts, kidneys, skin, joints, and eyes. Notably, oral involvement is infrequent. Moreover, isolated GPA within a specific tissue, organ, or system is exceptionally rare. Here, we present a case wherein severe gingival inflammation is the sole manifestation of GPA. Case Description: A 30-year-old woman presented with a two-year history of persistent and severe gingival bleeding, leading to hospitalization more than ten times due to symptomatic anemia requiring multiple blood transfusions. Upon evaluation, she exhibited left hyperplastic gingiva with red to purple petechiae. Aside from this finding, the physical examination was unremarkable. Extensive laboratory and serologic workup revealed anemia (8.8 g/dl), and positive anti-neutrophil cytoplasmic antibodies (ANCA, cytoplasmic pattern) and anti-proteinase-3 antibodies. A biopsy of the left maxillary gingiva confirmed acute vasculitis. The combination of serologic tests and gingival biopsy supported the diagnosis of GPA. Computed tomography scans of the neck and chest showed no abnormalities. Besides from gingival inflammation, there was no involvement of other organs or systems associated with GPA. Initial treatment comprised prednisone 20 mg orally daily and azathioprine 50 mg orally daily, resulting in a remarkable clinical response. Gingival inflammation and bleeding completely subsided, and prednisone dose was gradually tapered and eventually discontinued six months later. After one year of follow-up, the patient has remained in complete clinical remission. Conclusion: GPA presenting with isolated oral manifestations is extremely rare. Early diagnosis and treatment are crucial for achieving and maintaining disease remission. Dentists and otolaryngologists can play a pivotal role in the early detection of systemic diseases such as GPA, emphasizing the importance of interdisciplinary collaboration in healthcare.

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### Condiciones de salud de las personas de edad mayor Puerto Rico: 2022-2023 Envejecimiento en Puerto Rico seguimiento del Proyecto PREHCO

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Introducción: El proyecto Condiciones de salud de las personas de edad mayor conocido por PREHCO (Puerto Rican Elderly Health Conditions) es representativo de la población de 60 años o más que residían en sus hogares en 2000. Se diseñó para recoger información de calidad para estudiar los principales aspectos que afectan la salud de estas personas. PREHCO es un estudio longitudinal que ha completado su tercera fase y está próximo a iniciar la cuarta. Objetivo: Los objetivos este trabajo son describir las principales condiciones crónicas de salud de las personas de 78 años o más en 2022-2023(tercera ronda) en Puerto Rico y comparar el estado de salud de estas personas con él de hace aproximadamente tres lustros. Metodología: PREHCO se basó en una muestra estratificado por conglomerados, polietápico. Se visitaron más de 30,000 viviendas para obtener 4291 participantes. En tercera ronda se localizaron 86% de los 1299 que se presumieron vivos después de haber consultado el registro demográfico. Los resultados se presentan ponderados para ser representativos de la población de personas de 78 años o más en Puerto Rico para

el año 2022. Aprobado por el IRB: 2290033136R002. Fecha: 3/27/2023. Resultados: En la primera ronda (2002-2003) 20.4% de estas personas dijo haber sido diagnosticado con diabetes, 49.5% con hipertensión, 13.1% con enfermedades del corazón, y 46.1% con artritis. En la tercera ronda (2022-2023) el 39.1 % padecía de diabetes 73.3% del corazón, y 59.8% de artritis. Tanto en la primera como en la tercera más de la mitad (55%) consideraba que su salud era regular, menos 7% entendía que era mala. Conclusión: Los padecimientos parecen empeorar con la edad, pero no así la auto evaluación de su salud. Las proporciones de los que juzgaba su salud como excelente es cercana a los que percibían que era mala. Agradecimientos: El proyecto "El envejecimiento en Puerto Rico: Seguimiento longitudinal del Proyecto PREHCO" está auspiciado por el Instituto Nacional de la Vejez (NIA) [PTE Federal Award 1RO1AG064769-01]. RCMI Grant U54-MD007600 from the National Institute of Minority Health and Health Disparities (NIMHD), National Institutes of Health (NIH).

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### Proyecto AHORA: Educating Agencies and Communities in Puerto Rico in Mental Health First Aid

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Background and Objectives: Proyecto AHORA (Humanitarian Assistants Trained to Refer and Help, by its Spanish acronym) is a community project that began in 2015 at the University of Puerto Rico, Río Piedras Campus. Currently, it is funded under its third grant which runs from 2021 through 2026 from the Substance Abuse and Mental Health Services Administration (SAMHSA). It operates from the Institute for Psychological Research (IPsi). The project's objectives are to: train a wide array of participants across Puerto Rico; increase knowledge and awareness about mental health; and facilitate access to mental health services among those who need it. Methods: Government agencies and community organizations are contacted or invited to receive the Mental Health First Aid (MHFA) training, while the general public is welcomed to participate through announcements in the project's Facebook page and by word-of-mouth. The training teaches persons signs that someone may be experiencing a mental health challenge and how to appropriately intervene to provide initial help and refer/recommend professional mental health services, if necessary. Trainings are provided to participants virtually or in person. The training is currently approved for continuing education credits for health professionals. Results: As of January 2024, and since the third grant started in 2021, the project has trained over 1,700 participants and over 6,000 participants since the project started in 2015. Conclusions: We aim to continue providing the MHFA training in Puerto Rico and raise awareness about the importance of mental health among a wide array of populations, including health professionals. Acknowledgements: This project is funded by SAMHSA.

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### Development of Personalized Fitting Cervical Collars

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Background and Objectives: There are several pathologies requiring neck immobilization. The general availability for achieving neck immobilization is relatively thick, heavily padded collars in small, medium, and large sizes. The objective of this project is to produce personalized open-cell 3D-printed cervical collars that are created from the measurements of each patient. Methods: Early prototypes were made in our facilities using a high-resolution Artech 3D Eva scanner that was able to obtain virtual models of the head and shoulders that matched the 3D dimensions of the subject within several millimeters. The virtual STL model of the open-cell collar generated by Rhino 6 Grasshopper software, with an offset Voronoi tessellation mesh, was printed with an Anycubic Kobra 2 Max 3D printer and fitted to the subject.

Myosignal amplitude kits were built to detect strain in specific muscle groups in the neck. Initial evaluation of these collars was made by monitoring the myosignals of the sternocleidomastoid muscle group of the neck with and without wearing the open-celled collar. Results: Our results showed a reduction of activity in this muscle group of approximately sixty-five percent (65%) while wearing the collar. Although the preliminary methodology and data are very promising, having access to a high-resolution 3D scanner to obtain a model for the patient is time-consuming and expensive. Currently, we are engaged in developing a computer model using direct-selected measurements of subjects to improve the existing model. Conclusion: We expect that by using personalized cervical collars patients will be able to experience greater comfort during neck immobilization, facilitating the rehabilitation period. Future efforts will focus on developing open-cell collars that will allow for a greater quantity of fresh air to circulate through the neck area preventing severe allergic contact dermatitis. Acknowledgment: Department of Pharmacology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico.

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### Prevalence and factors associated with Long COVID in Puerto Rico: results from the Puerto Rico COVID-19 Assessment Study (PR-COAS)

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Background: The impact of "Long COVID," defined as symptoms that persist or get worse beyond four weeks after an initial SARS-CoV-2 infection, has not been fully described among underserved populations living in Puerto Rico. Objectives: To estimate the prevalence and determine the clinical, epidemiological, and risk factors associated with Long COVID in a cohort of Hispanics in Puerto Rico. Methods: We analyzed data from a prospective cohort study of persons living in Puerto Rico with laboratory-confirmed SARS-CoV2 infection in 2022. Sociodemographic characteristics, comorbidities, vaccination status, persistent or new symptoms or diagnoses after acute infection, healthcare utilization, and quality of life were collected in the initial interview. Chi-square or Fisher's exact test was used to compare characteristics in patients with and without Long COVID. Multivariable log-binomial regression was used to identify variables associated with Long COVID. Results: Of 261 patients recruited, 256 had a SARS-CoV-2 infection at least four weeks before the interview. Of these, the mean age was 48.0±15.9 years, 202 (79.2%) were women, and 191 (75.0%) had signs and symptoms of Long COVID. Patients with Long COVID had a significantly higher prevalence of tiredness (66.7% vs. 9.4%, $p<0.05$), muscle pain (56.3% vs. 3.1, $p<0.05$), headaches (49.0% vs. 6.3, $p<0.05$), joint pain (46.4% vs. 3.1%, $p<0.05$), and anxiety (41.7% vs. 3.1%, $p<0.05$). After adjusting for age, sex, and disease severity, having a chronic condition was significantly associated with higher odds of Long COVID (OR=3.24; 95% CI=1.55 – 6.81). Conclusions: Our preliminary data suggest a high prevalence of Long-COVID associated with an increased risk among those patients living with comorbidities in Puerto Rico. Acknowledgements: This project was supported by awards OT2HL161827 from NIH-NHLB, U54GM133807 from the NIH_GMS, 5S21MD000242, 5S21MD000138 and 2U54MD007587 from NIH-NCMHD. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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### Strengthening Diversity in Data Science Education for Hispanic Health Disparities Research

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Background and Objectives: Hispanics, constituting 18% of the US population, lack sufficient open data representation and comprise only 8% of enrollees in data science and related fields.Addressing this disparity is crucial for diversifying the NIH-funded workforce skilled in Artificial Intelligence (AI) and Machine Learning (ML). This study aims to enhance diversity by facilitating the creation of Findable, Accessible, Interoperable, and Reusable (#FAIR) Hispanic datasets, applying AI/ML to identify and mitigate health disparities in Hispanic populations. Methods: To bridge the gap, we developed a bilingual course (Spanish and English) focused on AI/ML topics, including Jupyter Hub, Python coding, ML libraries, and their application to mitigate Hispanic health disparities. This course, "Applying Artificial Intelligence and Machine Learning to Health Disparities Research version 2 (AIML+HDRv2)," builds capacity among investigators, graduate students, and technical personnel. The didactical materials, comprising 44 presentations, 44 lecture videos, 47 demonstrative videos, and 95 reading materials, were updated from the previous course. The content is presented in English, with videos recorded in Spanish and English subtitles. Professors and staff from UPR-MSC, along with invited speakers from other universities, contribute to the course. Results: Sixty-six applicants from UPR and other RCMI institutions applied, with 52 participants selected and enrolled in AIML+HDRv2. Notably, 33 participants successfully earned their certificate by completing the course within the established 3-month period during which it was instructed. The course, implemented asynchronously, focuses on teaching AI/ML tools for data analysis using public and private health datasets of Hispanic populations, as well as generating Hispanic datasets for health disparities research. Conclusion: AIML+HDRv2 represents a vital step towards enhancing diversity in data science education, addressing the underrepresentation of Hispanics. The course's bilingual and asynchronous nature ensures accessibility, fostering the creation and application of AI/ML tools to mitigate health disparities in Hispanic populations. Acknowledgements: We extend our heartfelt gratitude to the teaching assistant who played a crucial role in the development and execution of AIML+HDRv2. Their dedication and support significantly contributed to the success of the course. We also want to express our appreciation to the students who actively participated in the project. Their contributions enriched the learning experience and were integral to the accomplishment of AIML+HDRv2. Furthermore, we acknowledge the support provided by the RCMI (Research Centers in Minority Institutions) program. The program's commitment to fostering diversity and promoting research excellence has been instrumental in the successful implementation of this initiative.

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## Validación y adaptación de un cuestionario de clima de humor en el trabajo para la población puertorriqueña

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Trasfondo y Objetivos: Evaluar las actitudes y emociones del personal trabajador es esencial para el funcionamiento de todo tipo de organización. A su vez, dicha evaluación impactaría en la distribución de recursos humanos por medio de una toma de decisiones estratégica e informada. Para lograr su medición, este estudio se centró en adaptar y validar un cuestionario de clima de humor en el trabajo para trabajadores(as) puertorriqueños en diversas empresas y organizaciones. Adicionalmente, se examinó la correlación divergente del cuestionario con un instrumento de aburrimiento laboral validado en Puerto Rico. Método: El proceso incluyó una traducción doble (inglés-español) y la validación de contenido por un panel de expertos(as). Se realizaron análisis psicométricos, incluyendo un análisis factorial confirmatorio, para establecer la validez y confiabilidad del cuestionario. Resultados: El análisis factorial de un modelo inicial reveló un Chi-cuadrado de 196.3919 con 98 grados de libertad y un p-valor significativamente bajo. El RMSEA fue de 0.080224, encontrándose en un límite aceptable, y el CFI de Bentler alcanzó 0.9290326, el cual podría indicar un

buen ajuste. El SRMR fue de 0.06804057, dentro de un rango aceptable. Los valores de Alfa de Cronbach para los factores fluctuaron entre 0.88 y 0.95, indicando una alta consistencia interna. Aprobado por el IRB: 2324-049. Fecha: 11/29/2023. Conclusiones: Aunque el ajuste estructural del modelo inicial es moderado, el cuestionario demuestra alta consistencia interna. La discrepancia en el ajuste podría relacionarse con diferencias culturales o aspectos de la adaptación del instrumento, lo cual implicaría su ajuste por medio de modelos adicionales. Se sugiere una revisión de ítems para mejorar el ajuste. El estudio es un avance importante hacia un instrumento eficaz para medir el clima de humor en el trabajo en Puerto Rico. Con ajustes adicionales, este cuestionario podría ser una herramienta valiosa para la gestión emocional y actitudinal en el ámbito laboral.

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## Determination of the presence of bacterial contamination in the water of the Isla Verde Marine Reserve

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The Isla Verde Marine Reserve is one of the seven protected marine reserves located in the municipality of Carolina, PR and is a recreational area rich in marine life visited by locals and tourists frequently. The water in this area is susceptible to sewage water disposal, improper disposal of human and animal feces and the discharge of the Torrecillas Lagoon at Boca de Cangrejos due to potential sanitary discharges in this area. These activities can be harmful to the marine life and public health of the people that arrive the place. Fecal Indicator Bacteria (FIB) including Total and Fecal Coliforms, Enterococci, and *Escherichia coli*, are systematically employed to evaluate the sanitary condition of recreational waters. The aim of this study is to determine the presence of bacterial contamination in the water that surrounds the Isla Verde Marine Reserve using FIB which can be harmful to marine life and public health. For the determination of the FIB, water samples were collected in sterile bags at five (5) points of the marine reserve, and they were transported to the laboratory in a cooler to perform bacteriological analysis. We employed Colilert test to identify the presence of Total Coliform bacteria and *E. coli*, and Enterolert test to detect the presence of Enterococci bacteria; both methodologies are provided by IDEXX Laboratories. Also, Eosin Methylene Blue Agar (EMB) with membrane filter method was used to determine the presence and amount of *E. coli* and other types of gram-negative bacteria. The results suggest that the water of the Isla Verde Marine Reserve is contaminated by Enterococci, Coliforms, *E. coli*, and other gram-negative bacteria. However, it depends on the date, time, point and climate conditions. The higher amount of FIB was seen near the Boca de Cangrejos or near the discharge of sewage waters. Acknowledgements to: NASA Puerto Rico Space Grant Consortium NASA Cooperative Agreement 80NSSC20M0052

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## A cyclic diterpenoid restored pro-survival pathways implicated in learning and memory in an ex vivo model of Gulf War Illness

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Background and Objectives: Organophosphate (OP) compounds have been widely used as agricultural and household pesticides, jet engine lubricants, and warfare nerve agents. Delayed neuronal damage of OP intoxication is thought to contribute to neuronal death and various neurological illnesses, including Gulf War Illness (GWI). GWI is a currently untreatable multi-symptom disorder experienced by more than 250,000 veterans of the Persian Gulf War (1990-1991).

The distinctive hallmark of GWI includes chronic fatigue, migraine, muscle and joint pain, gastrointestinal problems, and cognitive disturbances such as impaired learning and memory function. Various studies have consistently linked these symptoms to exposure to pyridostigmine, DEET, permethrin, and traces of sarin (the most commonly used nerve agent). There is no effective cure for GWI. Methods: We developed an ex vivo GWI model utilizing rat hippocampal slices and performed population spike (PS) electrophysiological recording to assess neurotoxicity and neuroprotection. The size of the PS defines the number of functional neurons. Results: Our group demonstrated *ex vivo* that exposure to diisopropylfluorophosphate (DFP, sarin surrogate) and the above-mentioned neurotoxicants reduce the number of functionally active neurons in hippocampal slices. This loss of neuronal functionality can be reversed by the application of a 4R-cembranotrienes-diol (4R), a non-toxic cyclic diterpenoid with anti-inflammatory and anti-apoptotic properties known to modulated α7 nicotinic Acetylcholine Receptor (nAChR). To investigate whether 4R has a protective effect on neuronal survival in the presence of DFP, we combined pharmacological studies with electrophysiological recordings and molecular analysis. Our results demonstrate that 4R protects neuronal functionality and activates PI3K/AKT/GSK3β and CAMKII/MAPK/CREB pro-survival pathways involved in learning and memory. Conclusions: This cembranoid is a promising compound to protect the nervous system against neurotoxicants and is possibly therapeutic to improve learning and memory function in GWI. Acknowledgments: This research was supported by NIH NINDS SC2NS119144, TitleV Grant Award #P031S160068, COBRE Seeds 5P20GM103642.

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### Análisis de la cobertura mediática sobre los adultos mayores al inicio de la pandemia de COVID-19 en Puerto Rico

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Antecedentes: De marzo a diciembre de 2020 se reportaron 5562 muertes por COVID-19 en Puerto Rico. El 82% de fueron personas mayores de 60 años. La pandemia aumentó la vulnerabilidad de este grupo, resaltando el edadismo, que consiste en atribuir características a una persona únicamente por su edad. Los adultos mayores que asumen creencias negativas sobre la edad tienden a mostrar una peor salud física, cognitiva y mental. Los medios de comunicación pueden promover estos estereotipos. El objetivo de esta investigación fue identificar lenguaje edadista en medios de comunicación locales durante las primeras etapas de la pandemia de COVID-19. Métodos: Se realizó un estudio cualitativo exploratorio para analizar artículos publicados en dos periódicos digitales de Puerto Rico entre marzo y agosto de 2020. Se identificaron y analizaron 31 publicaciones que abordan asuntos relacionados con el COVID-19 afectó y los adultos mayores. El análisis de contenido se basó en el Cuestionario de Estereotipos Negativos de la Vejez, clasificando los hallazgos en factores de salud, motivacionales-sociales y de carácter-personalidad. Resultados: Los resultados describen las expresiones de edadismo utilizadas en los medios de comunicación y cómo se construyó la imagen de los adultos mayores al inicio de la pandemia. Se identificaron 130 ejemplos de estereotipos edadistas en el contenido y las imágenes de las 31 publicaciones: 101 estaban relacionados con salud, 26 con motivación-social y 3 con carácter-personalidad. Conclusiones: La imagen de las personas mayores que construyeron los medios de comunicación durante los primeros seis meses de la pandemia de COVID-19 en Puerto Rico estuvo vinculada principalmente al deterioro de su salud. Esto responde a que el tema de interés para la investigación es un asunto de salud, pero también se puede vincular con la construcción social sobre la vejez y cómo la presentan los medios de comunicación. Agradecimiento: Gracias al Dr. Jorge Santiago Pintor de la Facultad de Comunicación e Información- UPR-RP por su mentoría en este estudio.

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### Chronic ethanol exposure during distinct developmental stages differentially affects adult behavior in Drosophila

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Introduction: Chronic alcohol use has been shown to cause neuroadaptations in the brain that lead to several physiological and behavioral disorders including tolerance and dependence, cognitive deficits, and alterations in sleep patterns. However, how chronic alcohol exposure in the distinct developmental stages differentially affects the adult stage remains unknown. Here we use a Drosophila model to explore the lasting behavioral effects of chronic alcohol exposure during different stages of development that can be thoroughly studied in the adult individual. Methods: To understand this phenomenon, wild-type female Drosophila melanogaster were raised in an ethanol-containing medium at different stages of its life cycle: during larvae and/or adulthood. Adult flies were subjected to behavioral assays to understand the lasting effects alcohol has on tolerance development and sleep. Results: Among all experimental groups ethanol-reared flies, which were removed from a daily supplemented ethanol media during adulthood, showed significantly reduced periods of sleep time during the day. For tolerance development assays, control, ethanol-reared and lifetime-exposed flies developed alcohol tolerance. Nevertheless, while lifetime-exposed flies showed increased alcohol sensitivity, it was showed to be reduced for ethanol-reared flies. Conclusions: Collectively, our results demonstrated that chronic alcohol exposure has lasting effects in Drosophila behavior that can be measured in the adult individual. Moreover, our findings suggest that adult behavior is affected differently depending on the life stage in which the stimulus was presented. Acknowledgements: NIH Grant 5P20GM103642, NIH Grant 5R25GM061151-19, NSF Grant 1736026, NIH Grant 2R25NS080687-11, NIH Grant P20GM103475, NSF Grant 1633184, and NSF Grant 2131647.

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## Estrés Académico, Resiliencia y Bienestar de los Estudiantes del Programa Graduado de Enfermería con Especialidad en Anestesia

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Trasfondo y objetivos: El estrés académico en estudiantes de enfermería de anestesia afecta su capacidad de concentración, rendimiento académico y bienestar; puede provocar síntomas de depresión y ansiedad, abuso de sustancias e ideas suicidas. Igualmente, la resiliencia y el bienestar afectan el rendimiento académico a largo plazo, de estos estudiantes. Objetivos: (1) Describir los niveles de estrés de los estudiantes de los Programas Graduados de Enfermería con Especialidad en Anestesia de la Escuela de Enfermería del Recinto de Ciencias Médicas, (2) Evaluar los niveles de resiliencia y bienestar y (3) Examinar la relación entre los resultados de estrés, resiliencia y bienestar de los estudiantes. Método: Diseño cuantitativo, descriptivo-correlacional y transversal. Se reclutó una muestra de 16 estudiantes de los cuales 14 pertenecían al programa doctoral en Anestesia y 2 al programa de maestría. Los datos se recopilaron electrónicamente utilizando cuatro cuestionarios: un cuestionario demográfico, CD-RISC 10, WHO-5 y CEAU. Resultados: Los estudiantes mostraron un nivel de estrés promedio de 64,5 (DE=11,9). Un nivel de resiliencia promedio de 31,6 (DE=5,4) y el nivel de bienestar general fue de 48,5 (DE=20,4). Los resultados muestran una correlación negativa entre el nivel de estrés y bienestar de -0.464 (p=0.08) y el nivel de estrés y resiliencia de -0.314 (p=0.25). Estas correlaciones negativas sugieren que a mayor estrés, menor bienestar y menor resiliencia. Conclusión: Altos niveles de estrés afectan la capacidad de concentración, el rendimiento académico, el nivel de bienestar y la resiliencia de los estudiantes de Enfermería con Especialidad en Anestesia. Implica que, entre mayor nivel de estrés, menor nivel de resiliencia y bienestar. Es necesario implementar estrategias en el escenario académico para promover el desarrollo de la resiliencia y el bienestar personal ya que promueven que los estudiantes puedan afrontar el estrés.