



• ABSTRACT SUPPLEMENT •

PRHSJ  
Puerto Rico Health Sciences Journal



Published by the University of Puerto Rico Medical Sciences Campus

## ORGANIZING COMMITTEE

---

**Dr. José A. Capriles-Quirós**  
Associate Dean for Academic Affairs

**Prof. Luis E. Estremera-de Jesús**  
Chair Deanship for Academic Affairs

**Prof. Daisy M. Gely-Rodríguez**  
Co-Chair Deanship for Academic Affairs

**Dr. Edna E. Pacheco-Acosta**  
Deanship for Academic Affairs

**Dr. Ivelisse García Meléndez**  
Graduate School of Public Health

**Prof. Gloria Nazario-Pietri**  
School of Dental Medicine

**Dr. Elinette M. Albino Rodríguez**  
School of Health Professions

**Dr. Nivia Pérez Acevedo**  
School of Medicine

**Dr. Carmen Mabel Arroyo-Novoa**  
School of Nursing

**Dr. José Colón Sáez**  
School of Pharmacy

## TECHNICAL ASSISTANCES AND COLLABORATORS

---

**Mr. Gastón Rodríguez Ortiz**  
Deanship for Academic Affairs

**Mr. Javier O. Algarín Ortiz**  
Deanship for Academic Affairs

**Ms. Solymer S. Solis Báez**  
School of Nursing

**Dr. Jacqueline Flores Otero**  
School of Medicine

## ABSTRACTS\*

\*Disclaimer: All information contained in this document was published as provided by the Organizing Committee

### • Oral Presentations •

#### 1739 Dendritic Cells Apoptosis and Pro Inflammatory Cytokines Reduction Driven by Fh12 Protein in the Presence of Bacterial Components

Caleb Ruiz Jiménez<sup>1</sup>, Daiana Celias<sup>2</sup>, Leonaldo Silvane<sup>3</sup>, Bianca Valdés<sup>1,3</sup>, Laura Cervi<sup>2</sup>, Willy Ramos<sup>1</sup>, Ana M Espino<sup>1</sup>

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>National University of Cordoba, Córdoba, Argentina; <sup>3</sup>University of Puerto Rico Rio Piedras Campus, San Juan, PR

**Background & Objectives:** The helminth *Fasciola hepatica* secretes proteins that modulate cells of the immune system, generating anti-inflammatory responses. It has been demonstrated that *F. hepatica*'s fatty acid binding protein (Fh12) achieves its anti-inflammatory effect by a number of mechanisms. Fh12 specifically targets the LPS-binding pocket of the CD14 co-receptor, avoiding the LPS-CD14 interaction and stopping the entire TLR4 activation cascade. Concurrently, Fh12 also suppresses M1 activation of macrophages (MOs) by an alternative pathway and inhibits the capacity of MOs to phagocyte microbes. Dendritic cells (DCs) are antigen-presenting cells that play a key role in the early phase of innate immunity and that are essential in the development of the adaptive immune response. The main objective of the current study was to investigate the effects of Fh12 on the activation and function of these cells. **Methods:** DCs were isolated from bone marrow of naïve C57BL/6 mice, cultured, differentiated, and stimulated in vitro with Fh12 1h prior to LPS stimulation for 18 hrs. ELISA was used to quantify the amount of secreted cytokines in the culture supernatant. FACS was used to determine cell viability by Annexin V and 7ADD markers. **Results:** Results demonstrated that Fh12 significantly inhibits the production of IL-12p70 ( $p < 0.03$ ) and IL-6 ( $p < 0.0454$ ). Moreover, in contrast to the effect observed in macrophages, Fh12 induces a 50% reduction in dendritic cell viability, being 25% in early and 25% in late apoptosis, and this effect was found to be dose-dependent. These results suggest that Fh12 exerts a strong suppressive effect on activation of DC cells, which could have relevant implications in the subsequent development of adaptive immune response to microbial pathogens. **Acknowledgements:** This study was supported by MBRS-RISE R25GM061838-13 and NIH Grants G12MD007600, 2P40OD012217. Approved by IA-CUC, Protocol Number: 7870215

#### 1791 Increase in Incidence of Myelomeningocele in Puerto Rico Due to Ineffective Prevention Planning

Miguel Mayol MD, Michael Ortiz MS, Juan Vigo MD  
Department of Neurosurgery, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background:** Myelomeningocele (MM) is the most common type of neural tube defect, affecting 1-2/1,000 live births. It is also one of the most important preventable public health burdens. **Objective:** Identify and explain a possible cause for the observed recent increase in myelomeningocele cases that have been managed by our neurosurgery department. **Methods:** A retrospective descriptive study from the years 2002 to 2012 was performed, regarding the incidence of MM and its relationship with infant mortality rate, the Puerto Rico (PR) Department of Education's budget and the amount of cases of chlamydia and gonorrhea. These relationships were analyzed using Pearson's product-moment correlation and Spearman's rank-order correlation. Relationships were considered statistically significant if  $p < 0.05$ . **Results:** The incidence of MM shows an increasing trend throughout the studied time period. There was a strong, negative correlation between incidence of MM and infant mortality rate ( $r_s = -0.955$ ,  $p = 0.00081$ ). There was a strong, positive correlation between incidence of MM and Department of Education's budget ( $r_s = 0.927$ ,  $p = 0.0026$ ). There was a strong, positive correlation between incidence of MM and amount of cases of chlamydia and gonorrhea ( $r^2 = 0.79$ ,  $p < 0.01$ ). **Conclusion:** The incidence of MM has indeed been increasing in the last years. The absence of a relationship between incidence of MM and infant mortality rate may suggest that even though PR is undergoing an economic crisis, this has not affected the incidence of MM. However, the budget of the Department of Education has been increasing along with the amount of cases of chlamydia and gonorrhea. This could suggest that there is a deficiency in sexual education and prevention planning as preventable diseases related to sexual education have increased. **Acknowledgment:** No funding was provided and there are no conflict of interest to report.

#### 1907 Quality Improvement Project - Needs Assessment of Accurate Asthma Exacerbation Management in the Emergency Room at the University Pediatric Hospital

Kathy S Mendieta, MD<sup>1</sup>; Carlos A Flores, MD<sup>1</sup>; Marina Martínez Garri, MD<sup>2</sup>; Jahzel González Pagán, MD<sup>1</sup>

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Boston Children's Hospital

**Introduction:** Asthma is a chronic lung condition with 16% prevalence among Puerto Rican children. The use of asthma protocols have demonstrated to improve patient outcomes, yet data in Puerto Rico remain limited. **Objective:** Assess adherence and knowledge of the National Heart, Lung, and

Blood Institute (NHLBI) asthma guidelines in managing bronchial asthma exacerbations (BAE) in the University Pediatric Hospital's (UPH) Emergency Department (ED). Methods: A needs assessment was done revising the data of patients  $\geq 2$  years old with the diagnosis of "acute asthma exacerbation/acute bronchospasm" arriving to the ED during October-November 2016. A survey was given to pediatric residents to assess both knowledge of the NHLBI asthma guidelines and preparedness in managing BAE. Results: Forty records were revised, 25 were excluded. Mean age was 7.5 years (2 -13 years old), 60% male population. Of the 15 records that met inclusion criteria, only four cases were managed according to NHLBI asthma guidelines. Fourteen residents answered our survey and 9 (66%) reported being confident in managing patients with asthma exacerbations. However, only 3 (22%) residents passed the knowledge portion of the questionnaire. Conclusion(s): Acute asthma exacerbations are not being managed according to NHLBI guidelines in UPH ED. We found a marked discordance between residence's confidence in managing BAE and knowledge of the NHLBI asthma guidelines. An asthma protocol will be created for implementation during the next cycle of our quality improvement project for a better adherence to guidelines.

**1989 Maternal Hypertension as a Risk Factor for Severe Hypospadias**

*Tresgallo Parés E<sup>1</sup>, Perez Brayfield MR<sup>2</sup>, Jorge JC<sup>3</sup>*

<sup>1</sup>MD Program, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Surgery-Urology Section, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Department of Anatomy and Neurobiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background and Objectives: Hypospadias is a male congenital condition characterized by a ventral displacement of the opening of the urethral meatus spanning from subcoronal (Type I), to ventral shaft (Type II), to penoscrotal, scrotal, or perineal (Type III) positions. It has been previously reported that hypertensive disorders in pregnancy, whether it be gestational, chronic, or pre-eclampsia, are associated to hypospadias risk. However, there is scarcity of reports on this association according to severity of the condition. This study aimed to assess this association. Methods: Parents of children with hypospadias were interviewed in pediatric urology clinics using a series of questionnaires (n= 87). Previous history of hypertension was self-reported and severity of hypospadias was confirmed in the clinic. An ordered logistic regression test was used to calculate the risk associated with maternal history of hypertension and having a child with Type I (mild) and Type II and III (severe) hypospadias. Results: Mothers who self-reported previous history of hypertension are 2.3 times (95% CI: 0.64-8.28) at a higher risk for having a child with the more severe forms of

hypospadias compared to mothers who did not report history of hypertension. Conclusion: Our results are in agreement with an emergent literature on the association of maternal history of hypertension and hypospadias. Further studies are warranted to determine plausible sources for this association. Acknowledgments: The study received IRB approval, MSC-UPR and was supported by NIMHD and NIAID (U54MD007587). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

**2050 Shifting Views on the Management of Disorders of Sex Development**

*Katiria Pintor Jiménez<sup>1</sup>, Ana Ortiz Santiago<sup>1</sup>, Juan Carlos Jorge Rivera<sup>2</sup>*

<sup>1</sup>MD Program, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Anatomy and Neurobiology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Although there are clinical algorithms for the management of Disorders of Sex Development (DSD), genital reconfiguration by irreversible surgical procedures have prompted in-depth discussions about best medical practices among health practitioners, parents and patients. As recent as June 2017, three USA General Surgeons called for a distinction between surgical procedures that aim to preserve urinary and reproductive function versus those that aim to improve cosmetic appearance. Methods: The aim of this study is two-fold. First, it analyzes recent literature in favor and against DSD-related genital surgeries within the medical field and according to international intersex associations. Second, it analyzes a case study to illustrate some of the inherent clinical complexities that can present DSD patients. Results: Three USA General Surgeons provide a framework deeply rooted in bioethics to argue that surgical interventions should be kept at a minimum. This emergent view is consistent with arguments championed by intersex international associations in the USA, Latin America, and Europe. Our case study clearly illustrates some of the complexities in the clinical management of these cases even when surgical intervention is warranted. Data obtained from a clinical record showed an adolescent with penoscrotal hypospadias who required two urethroplasties with long-term complications that, despite best medical practices, resulted in three fistulectomies. Conclusion: Clinical algorithms, deeply rooted in scientific principles and professional consensus, benefit greatly from emphasizing bioethical principles to revise clinical care in an ongoing-basis with the best interest of patients in mind. Acknowledgments: The study was supported by NIMHD and NIAID (U54MD007587). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

**2017 Cortactin expression is driven by Wingless and neuronal activity to allow synaptic plasticity at the *Drosophila* neuromuscular junction**

*Carihann Dominicci Cotto, Marizabeth Perez, Carolina Maldonado, Bruno Marie*

Institute of Neurobiology, Anatomy and Neurobiology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Wingless (Wg) is essential for the plasticity of the nervous system. It was shown that the *Drosophila* neuromuscular junction (NMJ) serves as a model to understand the molecular mechanisms underlying activity-dependent synaptic plasticity. Upon repeated stimulations, the NMJ undergoes modifications in synaptic structure which are dependent on the Wg signaling pathway. Still, little is known about the cytoskeletal changes or molecular components controlled by Wg that allow this plasticity. Here, we focus on how the actin regulator Cortactin (Cttn) is related to this process. Using genetics and confocal microscopy, we assess the role of Cttn in regulating activity-dependent synaptic plasticity. We show that Cttn is present at the NMJ pre- and post-synaptically and that new synaptic structures related to synaptic plasticity are dependent on pre-synaptic Cttn. In addition, we show that Cttn protein levels increase after repeated stimulations and that this increase is required for activity-dependent plasticity. To strengthen these results, we blocked action potentials and neurotransmitter release using paralytic (para) and synaptotagmin (syt) mutants, respectively. After repeated stimulations, there is no increase of Cttn and no plasticity in para and syt mutants, thus neuronal activity is required for the increase of Cttn and synaptic plasticity. Lastly, we tested whether the increase in Cttn after stimulation is also dependent on Wg pathway. To do so, we asked whether Cttn intensity was affected in Wg mutant larvae and frizzled (*fz2*; Wg receptor) RNAi transgenic larvae. We found that Cttn is not increased after stimulation in both Wg and *fz2* deficient larvae and that plasticity is also impaired. This suggests that the pre-synaptic Wg signaling is required for the increase of Cttn and for plasticity. Overall our results strongly suggest that during repeated stimulation the expression of Cttn is required for the regulation of synaptic plasticity under the control of Wg signaling. Acknowledgment: Work supported by NIH: NIMHD 8G12-MD007600 (RCMI), NIGMS 1P20GM103642 (COBRE), NINDS SC2NS077924, NIGMS R25GM061838 (RISE) and NIGMS R25GM06115115 (RISE).

**2124 Pathological Distribution of Breast Cancer in Puerto Rico: A Comprehensive Analysis of Cancer Registry Data from 2010-2012**

*Mayrim V Rios Perez MD<sup>1</sup>, Ariana Hernandez Hernandez, BS<sup>2</sup>, Carlos Torres Cintron, MPH<sup>3</sup>, Nelimar Cruz Centeno BS<sup>4</sup>, Edna Mora MD<sup>1,5</sup>*

<sup>1</sup>Department of Surgery, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Biology, Rio Piedras Campus, San Juan, PR; <sup>3</sup>University of Puerto Rico, Puerto Rico Cancer Registry, San Juan, PR; <sup>4</sup>Department of Graduate Medical Education, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>5</sup>University of Puerto Rico, Comprehensive Cancer Center, San Juan, PR

Background: Breast cancer (BC) is the most common cancer that affect women in Puerto Rico and the leading cause of death among them. In the era of personalized medicine, characterization of BC based on receptor status is the standard of care. To our knowledge, there is no study available related to the characterization of BC patients in Puerto Rico based on receptor status. To fulfill this gap, we evaluated the distribution of BC in Puerto Rico based on receptor status subtypes, and hypothesized that our population will demonstrate similar incidences compared to those reported in United States. Methods: We determine the incidence of BC pathologic diagnosis and its subtypes based on hormone receptor (HR) status [estrogen receptor (ER), progesterone receptor (PR)], and HER2 across all cases with a diagnosis of BC from 2010-2012 collected by the Puerto Rico Cancer Registry after IRB approval. Incidence of BC is subcategorized by clinical and pathological characteristics. The results are presented as mean  $\pm$  SD and percentages. Results: Of 3,780 available cases we found incidences of: 69.1% (HR+/HER2-), 14.0% (HR-/HER2-), 11.1% (HR+/HER2+), and 5.7% (HR-/HER2+). Most cases occurred after 45-years of age. As expected, the most common histological types were ductal (72.6 %), lobular (11.4%), and others (16.0%). In terms of staging, 62.0% (3,602/5,814) of patients were diagnosed with localized disease. The incidences as reported by treatment received were: 47.8% (2,720/5,685) for breast conservation therapy, 41.4% (2,355/5,685) for mastectomy, 52.1 % (2,341/ 4,493) for radiotherapy, 48.0% (1,994/4,151) for chemotherapy, and 27.6% (1,016/3,676) for hormonal therapy. Conclusion: We report, for the first time, the distribution of BC subtypes in Puerto Rico. Our population demonstrated similar incidences of receptor status subtypes when compared to United States. This knowledge will allow further evaluation of epidemiological and biological factors that could explain these findings. Acknowledgement: None to disclose.

**2171 Mechanisms of resistance to Anti-EGFR/HER2 therapy in breast cancer**

*Paula R Vigo Morales<sup>1</sup>, Luis D Borrero Garcia<sup>2</sup>, Suranganie Dharmawardhane<sup>2</sup>*

<sup>1</sup>Department of Biology, University of Puerto Rico, Rio Piedras Campus, San Juan, PR; <sup>2</sup>Department of Biochemistry, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** The purpose of this study is to investigate the mechanisms of resistance to anti-epidermal growth factor receptor (EGFR) targeted therapies in breast cancer (BC). Previous studies have implicated the microRNA (miR)-200 family in maintenance of sensitivity to EGFR targeted therapies. Using therapy sensitive and resistant variants of the human breast cancer cell line SKBR3, we have shown that miR-200a is downregulated in the therapy resistant cells. Therefore, our objective is to validate the role of miR-200a in therapy resistance. The hypothesis is that re-expression of miR-200a will sensitize therapy resistant cells to EGFR targeted therapy. **Methods:** Therapy resistant variants of the therapy sensitive SKBR3 cell line, created by exposure to different concentrations of the tyrosine kinase inhibitor lapatinib, were used for the study. Decreased expression of miR-200a in the therapy resistant variant was demonstrated using RT-PCR. In this study, we ectopically expressed miR-200a in the therapy resistant and sensitive cells using a lentiviral vector containing miR-200a, or a control vector IC50s for cell viability were determined by MTT assays. **Results:** SKBR3 parental cell lines with or without ectopic miR-200a expression were sensitive to lapatinib treatment and showed a decrease in the IC50 when treated with lapatinib. Ectopic expression of miR-200a in the lapatinib resistant variant resulted in a decrease in the IC50 in response to lapatinib. **Conclusions:** Overexpression of miR-200a reduces the malignancy of SKBR3 parental cell lines and sensitizes lapatinib resistant cells to lapatinib therapy. These results suggest that miR-200a can be used as a therapeutic in combination with HER2/EGFR therapy to reduce cancer malignancy and therapy resistance. **Acknowledgements:** This work was supported by grants from NIH/NIGMS SC3GM094824 to SD, RCMI Programs G12RR03051 to UPR MSC, MBRS Program RISE (R25GM061838) to LDB and Bright Cure Program (U54) Comprehensive Cancer Center to PRV.

**2149 Development of a Transition of HealthCare Curriculum at the University of Puerto Rico's Pediatrics and Internal Medicine-Pediatrics Residency Program**

Guillermo Torres Viera, MD<sup>1</sup>; Melvin Bonilla Félix, MD<sup>1</sup>; Nilka de Jesús González, MD<sup>1</sup>; Ruth Santos Otero<sup>2</sup>

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>GAMMA Project, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Gaps in training regarding transitioning the care of patients with chronic diseases have been identified by residents of multiple primary specialties. This study aimed to evaluate current practices of transition care on subspecialty clinics and in some primary-care residency programs allied to the UPR-SOM. **Methods:** UPR-SOM attending phy-

sicians from pediatric cardiology, endocrinology, gastroenterology, nephrology, and hematology/oncology clinics, as well as Pediatrics and Med-Peds residents enrolled in respective programs from March 2017 to November 2017 were invited to participate. *Current Assessment of Health Care Transition Activities* survey was given to attending physicians with score <24 (max. score 32) suggestive of basic, rather than comprehensive, transition activities. A separate survey evaluated sociodemographic variables as well as resident and faculty knowledge, confidence, and experience in health care transition (HCT). **Results:** Transition activities assessment was completed by all subspecialty clinics with mean score 12.6±3.8 indicative of a basic transition process. Thirty-four residents and faculty completed the survey. Population was mostly female (91.2%) and from the Pediatric program (91.1%). Most (88%) had heard about transition, however (66%) had never assisted a patient in HCT with stated low familiarity with the process. Participants rated experience below-minimal with 53% never having assisted an adolescent with transition during training. Med-Peds residents rated higher overall knowledge in HCT (p=0.02) and had greater number of assisted transitions (p=0.02) in comparison to pediatric counterparts. Meanwhile, greater residency year was associated with higher rate overall level of experience (p<0.001). **Conclusions:** Although this study was unable to measure change in resident aptitudes with the implementation and measurement of a HCT curriculum, it does provide a first needs assessment regarding lack of a transition process in subspecialty clinics, and studied residency programs allied to UPR SOM. Further studies in other program experiences and in implementation of transition policies will be of great value to better understand the transition process.

**2072 Sigma-1R antagonist (BD1047) prior to cocaine reduces cathepsin B secretion in HIV-1 infected macrophages *in vivo* and *in vitro***

Omar Vélez López<sup>1</sup>, Anabelle Segarra Marrero, PhD<sup>2</sup>; Manuel Álvarez Ríos<sup>3</sup>, Santhi Gorantla, PhD<sup>4</sup>; Loyda M Meléndez PhD<sup>1</sup>

<sup>1</sup>Microbiology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Physiology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>University of Puerto Rico Río Piedras Campus; <sup>4</sup>University of Nebraska Medical Center

**Background & Objectives:** Pathogenesis of HIV-associated neurocognitive disorders (HAND) is mediated through the infiltration of perivascular macrophages into the brain that secrete viral proteins, neurotoxic and inflammatory factors. One of these factors is cathepsin B (CATB), a lysosomal cysteine protease that induces neuronal apoptosis, increases in plasma and cerebrospinal fluid from HIV-1 infected patients (Cantres-Rosario et al., 2013). Cocaine use further potentiates

CATB neurotoxicity *in vitro* and *in vivo* (Zenón et al., 2014). Modulation of sigma-1 (Sig1R) by cocaine increases oxidative species, calcium flux and other factors that promote lysosomal disruption. However, the role of Sig1R in CATB secretion and HIV-1 replication in presence of cocaine in macrophages is unknown. We hypothesized that pharmacological modulation of Sig1R would alter CATB secretion from HIV-1 infected macrophages *in vitro* and *in vivo*. Methods: Monocyte derived-macrophages (MDM) from HIV-1 seronegative donors were isolated, infected with HIV-1<sub>ADA</sub>, and pretreated with Sig1R antagonist (BD1047) or agonist (PRE-084) prior to cocaine for 3, 6, 9 and 11 days post-infection (dpi). Results: Infected macrophages with BD1047 10 µM prior to cocaine decreased infection levels and CATB secretion when compared to cells treated with cocaine (p<sub>24</sub>=130 ng/mL vs. 15 ng/mL; 3000 ng/mL vs. 10 ng/mL). No significant differences in p<sub>24</sub> or CATB levels were found in PRE-084 and cocaine treatments. BD1047/cocaine MDM supernatants reduced neurotoxicity when compared to supernatants from infected MDM exposed to cocaine (p≤0.01). The effect of Sig1R antagonist was verified *in vivo* using the HIV encephalitis (HIVE) mouse model. Conclusions: Cocaine increases CATB secretion through Sig1R modulation in HIV-infected macrophage and that Sig1R antagonist BD1047 might be a potential therapy for reducing CATB induced neurotoxicity in HIV-1 infected patients that use cocaine. Acknowledgments: National Institutes of Health National Institute of General Medical Sciences (NIGMS) SC1GM113691, NIMH U54-MD007600, MBRS-RISE Program- R25GM061838, UNMC- U54NS043011.

**2203 Regulation of Adaptive Immunity by 2-deoxyguanosine nanoparticles co-formulated with a chimeric DNA plasmid encoding for Vaccinia virus A27L antigen**  
Saritza Santos<sup>1</sup>, Maité Ramírez<sup>1</sup>, Eric Miranda<sup>1</sup>, Nelson Reyes<sup>3</sup>, Osmarie Martínez<sup>1</sup>, Maxier Acosta<sup>2</sup>, José Rivera<sup>2</sup>, Miguel Otero<sup>1</sup>

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Puerto Rico Rio Piedras Campus; <sup>3</sup>Universidad del Este, PR

**Background & Objectives:** Unlike live-attenuated vaccines, the rest of vaccines (e.g. DNA-based) often need adjuvants to generate robust immune responses. Alum-based adjuvants are the only adjuvants approved by the Food and Drug Administration (FDA) for human use. Then, this limited availability of adjuvants promotes the study of novel immunomodulators to trigger protective immunity against pathogens. Therefore, we sought to evaluate the immunomodulatory properties of 2-deoxyguanosine nanoparticles (SHS) in a DNA vaccine coding for Vaccinia Virus Western Reserve A27 protein (pOD1-A27L<sub>opt</sub>). To further improve antigen expression, the A27L sequence was codon optimized and linked to the Outer Domain-1 (OD1) of HIV-1 gp120 protein sequence.

**Methods:** pOD1-A27L<sub>opt</sub> with or without SHS was administered intramuscularly to female Balb/c mice. ELISpot and ELISA assays were performed to assess adaptive immune responses. Results: ELISpot assay showed significant higher frequency of IFN-γ-spot forming cells in mouse immunized with pOD1-A27L+SHS. Moreover, we found a significant decrease in IFN-γ-producing cells of CD8+ cell-depleted samples from mice immunized with pOD1-A27L<sub>opt</sub>+SHS. Quantikine® ELISA showed higher significant production of IFN-γ over IL-4 in supernatant of splenocytes isolated from mice receiving pOD1-A27L<sub>opt</sub>+SHS. Formulation of pOD1-A27L<sub>opt</sub> with SHS induces a significant higher production of total IgG and IgG2a as assessed by ELISA. Conclusion: We demonstrated that SHS improve cellular and humoral responses of an A27-DNA construct. Specifically, they drive the immunity towards a Th-1 type with an important contribution of CD8+ cells to this IFN-γ response. Moreover, inclusion of these nanoparticles, potentiate the IgG antibody responses, specifically those associated with a Th-1 type (IgG2a). These data support the study of SHS nanoparticles as a novel adjuvant for DNA vaccines against existent and emerging infectious agents. Acknowledgments: NIH NIGMS SCORE SC3GM116698, NIGMS RISE R25GM061838, NIH NCRR UPR G12RR003051 and NIH NIMHD UPR U54MD007600 grants supported this work. \*Approved by IACUC (9250116).

**2208 Previous Immunity to Zika Modulates Dengue Infection Pathogenesis and Immune Response Kinetics in Rhesus Macaques**

Erick X Pérez Guzmán<sup>1</sup>, Petraleigh Pantoja<sup>1,2</sup>, Alexandra Ortiz Rosa<sup>3</sup>, Crisanta Serrano Collazo<sup>1</sup>, Idia V Rodríguez<sup>2</sup>, Luis Giavedoni<sup>4</sup>, Vida Hodara<sup>4</sup>, Lorna Cruz<sup>2</sup>, Teresa Arana<sup>1</sup>, Melween I Martínez<sup>2</sup>, Laura M Parodi<sup>4</sup>, Mariah A Hassert<sup>5</sup>, James D Brien<sup>5</sup>, Amelia K Pinto<sup>5</sup>, Laura J White<sup>6</sup>, Aravinda de Silva<sup>6</sup>, Carlos A Sario<sup>1,2</sup>

<sup>1</sup>Department of Microbiology and Medical Zoology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Unit of Comparative Medicine, Caribbean Primate Research Center, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Department of Biology, University of Puerto Rico Río Piedras Campus, San Juan, PR; <sup>4</sup>Texas Biomedical Research Institute, San Antonio, Texas; <sup>5</sup>Department of Molecular Microbiology and Immunology, Saint Louis University School of Medicine, Saint Louis, Missouri; <sup>6</sup>Department of Microbiology and Immunology, University of North Carolina-Chapel Hill, North Carolina  
Recent Zika virus (ZIKV) outbreak in Dengue (DENV) endemic regions has raised concerns about their cross-immunological interactions and implications of this for development of severe clinical manifestations. During the ZIKV epidemic, part

of the population naïve to DENV like newborns, DENV-naïve children/adults and travelers could be exposed to ZIKV before DENV. Eventually, herd immunity will reduce ZIKV transmission allowing DENV to re-emerge and potentially infect the ZIKV-immune population. ZIKV-immune serum can enhance DENV infection *in vitro*, however, little evidence is available about this phenomenon occurring *in vivo*. The dissected role of short and long-term ZIKV pre-existing immunity in the outcome of a subsequent DENV infection remains unclear. Our hypothesis is that ZIKV pre-existing immunity will not enhance DENV pathogenesis, but modulates DENV-elicited immune response in rhesus macaques. Our study design is based on the infection of 14 rhesus macaques with DENV. Cohort 1 [ZIKV-immune10mo(N=4)] and 2 [ZIKV-immune2mo(N=6)] were exposed to ZIKV 10 and 2 months, respectively, before DENV infection, and cohort 3 [Naïve(N=4)] was naïve to ZIKV. Cohorts were clinically monitored and sequentially bled for serum and PBMCs samples collected for up to 3 months after DENV infection. qRT-PCR results show that DENV viremia peak at day 5 post-infection was significantly enhanced in the ZIKV-immune2mo. However, the ZIKV-immune10mo show the greatest reduction of total viremia days compared to Naïve, which suggest no enhancement of DENV-infection *in vivo*. In accordance, the cytokine and T-cell functional profile of ZIKV-immune10mo showed higher levels of cytokines/chemokines/markers involved in the activation of cellular immune response, while Naïve showed a more pro-inflammatory profile. Furthermore, the neutralizing antibody response of ZIKV-immune10mo against DENV was significantly higher than Naïve, in contrast to ZIKV-immune2mo. In conclusion, during a DENV infection, long-term previous immunity to ZIKV could positively modulate the immune response to induce protection. This research was supported by:NIHODP40OD012217,2U42OD021458-15,R25GM061838.

**2103 The use of scopoletin (SCOP) and horseradish peroxidase (hrPXase) to measure the reducing power of plasma**

*S García Castiñeiras<sup>1</sup>, C Díaz Vélez<sup>2</sup>*

<sup>1</sup>Department of Ophthalmology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Pavía Hospital private practice, San Juan, PR

Background & Objective: It is now amply accepted that there are health conditions in which oxidative stress plays an important etiopathogenic role: cardiovascular, neurodegenerative, aging, cancer, for example. Attempts have been made in the past to design methods (ORAC, TEAC, FRAP, among the most common) able to describe in an easy way the antioxidant capacity of the organism and its response to treatment or interventions. Thus far, however, the results fell short of expectations, perhaps reflecting the multifaceted and extremely complex nature of redox homeostasis. In the course of using the

SCOP/hrPXase method of H<sub>2</sub>O<sub>2</sub> determination in physiological fluids, we realized that such method can be easily transformed into an interesting way to measure the reducing activity of plasma, mostly because of the unique properties of the active site /catalytic cycle of the enzyme. Method: Reduced scopoletin (SCOP<sub>red</sub>) is a highly fluorescent compound of plant origin that loses its fluorescence upon oxidation (SCOP<sub>ox</sub>). The hrPXase enzyme, after its initial reaction with H<sub>2</sub>O<sub>2</sub> (substrate 1), captures H-donors (SCOP<sub>red</sub> and plasma reducing substances) as second substrates competing among each other for the regeneration of the native enzyme, based mainly in their reduction potentials (E<sub>0</sub>). The transforming strategy, therefore, is adding to a plasma sample SCOP<sub>red</sub> and hrPXase and then known amounts of H<sub>2</sub>O<sub>2</sub>, until the fluorescence of SCOP<sub>red</sub> starts to disappear. Results: The concentration of H<sub>2</sub>O<sub>2</sub> needed to obtain a certain endpoint in the resulting, expected sigmoid line of fluorescence is the equivalent to the molar amount of reducing substances in the analyzed plasma. This method has the added advantage of not using as the oxidant an artificial free-radical generator with azo-compounds as do most of the available capacity methods cited above. Acknowledgement: The authors are indebted to the MBRS-RISE Program (R25 GM061838) for access to special instrumentation.

**1851 Adenosine A1-Dopamine D1 Receptor Heteromers Control the Excitability of the Spinal Motoneuron**

*MS Rivera Oliver<sup>1</sup>, E Moreno<sup>5</sup>, Y Alvarez Bagnarol<sup>2</sup>, C Ayala Santiago<sup>3</sup>, J Alvarez Gonzalez<sup>4</sup>, V Casado<sup>5</sup>, S Ferre<sup>6</sup>, M Díaz Ríos<sup>1,2</sup>*

<sup>1</sup>Institute of Neurobiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Anatomy and Neurobiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Biology, University of Puerto Rico, Rio Piedras Campus, PR; <sup>4</sup>Assumption College, Worcester, MA; <sup>5</sup>Biochemical and Molecular Biomedicine, University of Barcelona, Spain; <sup>6</sup>National Institute on Drug Abuse, Intramural Research Program, NIH, Baltimore, MD

Background & Objectives: Adenosine is a ubiquitous neuro-modulator in the central nervous system (CNS), which is involved in numerous functions. More general functions include the regulation of arousal and its role in neuroprotection. The modulatory role of adenosine on dopaminergic transmission depends largely on the existence of antagonistic interactions mediated by specific subtypes of adenosine and dopamine receptors, the so-called A2AR-dopamine D2 receptor (D2R) and A1R-dopamine D1 receptor (D1R) interactions. These specific adenosine-dopamine receptor interactions seem to be involved in the central effects of caffeine, a non-selective A1R-A2AR competitive antagonist. We have recently found a significant antagonistic interaction between A1R and D1R ligands in the mouse spinal cord that mediates the ability of caffeine to



produce locomotor enhancement by acting on spinal circuits, although the molecular mechanisms and cellular localization remained to be determined. Methods: We used lumbar slices of the mouse spinal cord to conduct electrophysiological, immunohistochemical and biochemical techniques to detect the presence of A1R-D1R heteromers. Results: In the present study, A1R-D1R heteromerization is first demonstrated in mammalian transfected cells using biophysical techniques. Synthetic peptides with the amino acid sequence of specific transmembrane domains (TMs) of the D1R provided the tool to demonstrate that the antagonistic interaction between A1R and D1R ligands depends on A1R-D1R heteromerization and allowed the specific identification of A1R-D1R heteromers in spinal motoneuron, where they mediate the spinal modulatory control by adenosine and dopamine and the strong spinal pharmacological effects of caffeine. Conclusion: These results can have important implications for the pharmacotherapy of spinal cord injury (SCI). Acknowledgements: COBRE Center for Neuroplasticity (NIH NIGMS 1P20GM103642), National Institute of Drug Abuse intramural funds, Nikon A1R confocal microscope (NSF DBI-1337284), RCMi (NIMHD 8G12-MD007600), RISE Program (R25GM061151-13) and Spanish Ministerio de Ciencia y Tecnología (SAF2014-54840-R).

**1770 The Occurrence of Delirium in Cardiovascular Surgical Patients**

*Elisabet Pérez Rodríguez, RN, MSN; Nancy Dávila Ortiz, RN, PhD; Carmen Mabel Arroyo Novoa, RN, PhD; Milagros Figueroa Ramos, RN, PhD*

Graduate School of Nursing, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Objective: Describe the occurrence and type of delirium in cardiovascular surgical ICU patients and explore the association between delirium and total amount of sedatives and analgesics administered in the last 24 hours, time on mechanical ventilation and length of stay in ICU and hospital. Method: A correlational-descriptive study was conducted. Delirium was measured prospectively with the Spanish CAM-ICU twice (AM/PM) on post-operative day 1. Demographic and clinical data were retrieved from the clinical record. Results: Forty-three patients were evaluated. Most (81.4%) had coronary bypass surgery, 55.8% were male and sample had a median age of 72 (IQR 67-76). Delirium occurred in 25.6% of participants with 72.7% of these presenting with hypoactive delirium and most were women (64%). Almost all patients (95.3%) received intermittent sedation, 79% received lorazepam, while 14% received a combination of lorazepam with midazolam. Also, 16.3% received continuous propofol after surgery. For pain management, 67% of patients received analgesics. Patients with positive delirium were on mechanical ventilation longer than those without delirium ( $U = 92.5, p = .02$ ). Conclusion:

Our finding of occurrence in delirium is consistent with those in other studies (ranging 13.3-28%). Additionally, the predominant presence of hypoactive delirium and the increased time on mechanical ventilation in those patients with positive delirium is in accordance with the literature. No association with delirium was found in additional evaluated variables, probably because the small sample size did not provide enough power.

**1816 Estilos de Aprender de Estudiantes de Bachillerato en Ciencias de Enfermería y Preferencias por Prácticas de Enseñanza**

*Carmen A Custodio Ortiz, CNM, MSN, EdD<sup>1</sup>; Isabel Escabí, EdD<sup>2</sup>*

<sup>1</sup>Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR; <sup>2</sup>Recinto Metropolitano, Universidad Interamericana de Puerto Rico

Antecedentes y Objetivos: La educación de enfermería del siglo XXI debe ser efectiva y centrada en el estudiante. Identificar estilos de aprender y preferencias por prácticas de enseñanza permite considerar la diversidad de aprendizaje y planificar una enseñanza efectiva. Los objetivos de esta investigación fueron: 1) Identificar estilos de aprender de estudiantes de bachillerato en enfermería; 2) Determinar preferencias por prácticas de enseñanza; 3) Determinar la relación de estilos por edad, género, años de estudio y preparación previa; 4) Determinar relación entre estilos y preferencias por prácticas de enseñanza. Metodología: Estudio descriptivo correlacional. Se aplicaron 2 cuestionarios (Inventario Estilos de Aprender (IEA-3) de Kolb e Inventario Preferencias Prácticas de Enseñanza de Estudiantes de Enfermería (IPPEEE) a 139 estudiantes de bachillerato en enfermería en diferentes años de estudio. Se utilizaron estadísticas descriptivas y no paramétricas para analizar datos. Resultados: El 94.2% de los participantes tenían entre 21-27 años y el 77% eran féminas. Predominó el estilo asimilador (53.2%). Otros estilos identificados fueron convergente (23.7%), divergente (15.6%), acomodador (5%) y equilibrio (2.2%). Las prácticas de enseñanza con mayor preferencia fueron simulación, práctica clínica, conferencia, solución de problemas y uso métodos audiovisuales. Se encontró relación estadísticamente significativa entre el estilo de aprender y práctica de trabajo cooperativo ( $\phi = .470, p < .015$ ). Conclusiones: La influencia del ambiente educativo en el aprendizaje del estudiante y su formación como futuro profesional de enfermería en el siglo 21, es un aspecto que debe ser parte integral de todo currículo y programa educativo en enfermería. Identificar y tomar en cuenta los estilos de aprender y preferencias por prácticas de enseñanza, dirige la planificación e implementación de un proceso de enseñanza aprendizaje efectivo centrado en el estudiante. Esto permitirá formar futuros profesionales de enfermería altamente cualificados para proveer servicios de salud óptimos en una sociedad compleja y cambiante.

**1798 Estimado del Dolor en Pacientes Sedados en Ventilador Mecánico**

*Annibelle Suárez Gómez, RN, MSN; Luis A Varela González, RN, MSN; Nancy Dávila Ortiz, RN, PhD*  
Programa Graduado, Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

**Antecedentes y Objetivos:** El dolor en los pacientes sedados en ventilador mecánico es un síntoma que la mayoría de las veces está presente en los pacientes, pero muy pocas veces es estimado. Este estudio describe la presencia de dolor en esta población, si el profesional de enfermería lo está estimando y con cuánta frecuencia. **Método:** Se utilizó un diseño descriptivo-observacional y una muestra por conveniencia, constituida por 40 pacientes adultos politraumatizados con un nivel de sedación (RASS) de -1 a -3. Se aplicó el instrumento *Critical-Care Pain Observational Tool* (CPOT) y se evaluó la hoja de documentación del estimado de dolor en el expediente clínico del paciente. **Resultados:** Los participantes en su mayoría (n=27, 67.5%) fueron varones con una media de edad de 53.92 (DE=17.3) años. El 92.5% de los pacientes presentaron comportamiento de dolor, el 77.5% obtuvo un CPOT con un valor de 1 a 2, mientras que el 12.5% demostró tener dolor significativo con un valor de 3 a 4. En cuanto al estimado de dolor y frecuencia de la valoración fue estimado en el 100% de los pacientes y en el 97.5% de los pacientes el dolor fue estimado cada una hora por el profesional de enfermería. A pesar de que el estimado del dolor fue efectuado en el 100% de los pacientes, la documentación fue reportada bajo dolor asumido con un valor de cero, lo que indicaba ausencia de dolor. **Conclusión:** El estimado de dolor en esta población continúa siendo un desafío para el personal de enfermería. La utilización de escalas válidas y confiables es fundamental para estimar y a su vez optimizar el manejo del dolor, reducir las complicaciones y mejorar los resultados.

**2003 Las experiencias clínicas de los estudiantes de enfermería: Estudio de Caso hacia la integración de la mentoría**

*Ivelisse Rivera Rodríguez, RN, EdD*  
Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

**Antecedentes y Objetivos:** Las experiencias clínicas son una parte esencial en la formación profesional de los estudiantes de enfermería. El periodo formativo comprende la enseñanza de competencias por parte de instructores clínicos y los profesores de manera tal que los estudiantes puedan ejercer la disciplina de manera segura y profesional cuando finalicen su programa académico. El propósito de este estudio fue conocer cómo se llevan a cabo las experiencias clínicas de estudiantes de bachillerato en enfermería y qué estrategias de enseñanza se utilizan en los escenarios de práctica. Además, se exploraron las relaciones didácticas dadas entre los estudiantes, los instructores clínicos

y los profesores. **Método:** Cualitativo con diseño de estudio de caso. Se realizaron seis grupos focales: 2 con profesores; 2 con instructores clínicos y 2 con estudiantes de enfermería. Los datos se transcribieron, codificaron e interpretaron. **Resultados:** Todos los participantes concordaron en que las experiencias clínicas son muy importantes para asegurar la calidad en la formación de los estudiantes. Sin embargo, los instructores clínicos señalaron desconocer sobre lo que se espera que ellos realicen con los estudiantes de enfermería y recomendaron una mejor coordinación entre la academia y los escenarios de práctica para mejorar las relaciones didácticas y la comunicación. Los estudiantes expresaron la necesidad de que se utilicen nuevas estrategias como la mentoría para mejorar las experiencias clínicas y favorecer su proceso de enseñanza-aprendizaje. **Conclusión:** El practicar la profesión de enfermería es un gran reto en las agencias de salud en Puerto Rico. Por tanto, es importante fomentar una mejor coordinación entre la academia y el escenario de práctica, integrar el uso de nuevas estrategias de enseñanza y la identificación de mentores que contribuyan en la formación de los estudiantes.

**1970 Estimado de Dolor en Niños Conectados a Ventilación Mecánica en la Unidad Cuidado Intensivo**  
*María Aurora Luna Rivera, RN, MSN; Janet Rodríguez, RN, PhD*

Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

**Antecedentes y Objetivos:** Realizar el estimado de dolor en los pacientes pediátrico con condiciones críticas representa un reto. Existe evidencia en la cual nos indica que si el estimado de dolor no se realiza aumenta la morbilidad y mortalidad en esta población. Este estudio describe la ocurrencia de dolor en pacientes pediátricos conectados a ventilador mecánico en una unidad de cuidado intensivo. Además, describe el tipo y la cantidad total de analgesia y sedantes administrados en las 24 horas previas al estimado. **Metodología:** Estudio descriptivo en el cual se utilizaron la escala de comportamiento de dolor *Face, Legs, Activity, Cry, and Consolability* (FLACC) modificada y el *Richmond Agitation Sedation Scale* para estimar el nivel de sedación. Estos instrumentos fueron aplicados una sola vez a en los pacientes admitidos en la unidad de cuidados intensivos del Hospital Pediátrico Dr. Antonio Ortiz. **Resultados:** Se reclutaron 25 participantes con una mediana de edad de 7 años (2 - 10.5 años). La mayoría de los pacientes (80%) presentó dolor. La terapia analgésica más utilizada fueron los opioides (72%), mientras que la terapia de sedantes más utilizada fueron las benzodiazepinas (80%) en los pacientes conectados a ventilación mecánica. Las cantidades totales de los fármacos más predominantes en 24 horas previas al estimado de dolor fueron *Fentanyl* (76%) con una mediana 0.72 mg (0.12 - 1.14mg) y *Midazolam* (80%) con una mediana 72 mg (12 - 126mg), su modo de administración más común fue infusión continua.

Conclusión: A pesar de la terapia analgésica administrada a los pacientes en ventilación mecánica el dolor, se presentó en la mayoría de estos. La utilización de escalas apropiadas para el estimado de dolor y el nivel de sedación es fundamental para mejorar los resultados de los pacientes.

**1724 Development and Implementation of a LGBT Health Curriculum for Mental Health Providers in Puerto Rico**

*Alexis L Laboy Almodóvar, MPH, MPHEc<sup>1</sup>; Edda I Santiago Rodríguez, DrPHc, MPH, MA<sup>2,3</sup>; José J Martínez Vélez, MPHE, CHES<sup>3</sup>; Carlos E Rodríguez Díaz, PhD, MPHE, MCHES<sup>2,3</sup>*

<sup>1</sup>Master Program in Public Health Education, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Doctoral Program in Public Health with specialty in Social Determinants of Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Center for Evaluation and Sociomedical Research, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Health education, as a public health strategy, can provide to build competencies among healthcare providers aimed at reducing health disparities. Lesbian, Gay, Bisexual, and Trans (LGBT) populations in Puerto Rico (PR) are exposed to stigma and discrimination, both in daily occurrences and in healthcare encounters. Limited competencies on LGBT health among healthcare providers result in low access and retention in care, inadequate provision of services, and poorer health outcomes. Methods: Considering mental health care needs of LGBT populations in PR and perceived limited capacity among mental healthcare providers, a LGBT health capacity building strategy targeted to these professionals was developed in collaboration with the Administration of Mental Health and Addiction Services (ASSMCA in Spanish). Core components of the curriculum were LGBT terminology, best practices for intervention, use of hormones and improvement of information intake. Pre/post-test and impact evaluation were administered to assess changes in knowledge, attitudes towards LGBT health, and participants' satisfaction with the intervention. Results: A total of 10 interventions were offered in different locations in PR and 594 health professionals participated. 544 (91%) of the participants completed the impact evaluation, 531 (89.3%) answered pretest and 518 (87.2%) answered the posttest assessments. 71.5% of the population were women, had a mean age of 45 years and 17 years of work experience. Self-assessed health knowledge before training was "intermediate" (39.7%;n=216), after training it was "advanced" (60.8%;n=331,p<0.001). Most areas of knowledge evaluated through the pre-post-test showed positive changes. Participants showed increased knowledge in understanding health disparities related to LGBT individuals

(48.4%) and in the correct use of terms associated to sexual orientation (33.3%) and gender identity (27.7%). Conclusions: Results of this intervention assessment show that the development of a LGBT health curriculum for healthcare providers could be an effective strategy to improve knowledge and competencies for improved non-stigmatizing services for LGBT populations in PR.

**2162 Hurricane Maria's impact on long term care facilities in Puerto Rico: A Pilot Study**

*B González Orsini<sup>1</sup>, C Rosario Ocasio<sup>1</sup>, M Robles Almanzar<sup>1</sup>, J Cordero Calderón<sup>1</sup>, B Jiménez Malavé<sup>1</sup>, L Rodríguez Figueroa<sup>2</sup>, N Labault Cabeza<sup>1</sup>*

<sup>1</sup>Gerontology Program, Human Development Department, Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Biostatistics and Epidemiology Department, Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background: Disasters such as hurricanes emphasize the critical importance of emergency management, which involves planning and organization to meet emergencies and their impact. Advanced age citizens in long term care facilities are the sector within the elderly that commonly suffer from more conditions, and given their degree of dependence, are most vulnerable in these types of events. Methods: A pilot cross-sectional study aimed to explore the adequacy of the emergency management plan among 18 long term care facilities in the metropolitan area in Puerto Rico. With the use of a semi-structured questionnaire aimed at exploring the adequacy of the emergency and natural disaster management plans; as well as the degree of communication and existence of a system or network of response to disasters in the country. Results: Preliminary results indicate that more than 50% had no communication with state agencies. Half of the institutions do not carry out assessments to identify potential risks; or have strategies to take care of residents with special needs. Only 62% contemplate transfers of residents to hospitals or dialysis centers. Conclusion: Participating facilities demonstrated poor emergency planning for natural disasters due to probable lack of a protection policy and standardized implementation strategies island wide. This information will help lay out the groundwork to establish a new emergency management policy with prevention strategies and awareness-raising programs for this vulnerable population in long term care facilities. "Approved by IRB"

**2060 Estrategias de resiliencia para la recuperación post María en un programa de Medicina Interna**

*Yohana De Jesús Berríos, MD*

Departamento de Medicina Interna, Escuela de Medicina, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Trasfondo y objetivo: El 20 de septiembre de 2017 el Huracán María azotó a Puerto Rico devastando el país. La Escuela de Medicina activó los planes de contingencia. Los retos aumentaron y el Programa de Medicina Interna encomendó hacer una evaluación del bienestar de los médicos-residentes. Método: Se usó el formato de entrevista semiestructurada con 4 preguntas abiertas que se ampliaban según las necesidades particulares de cada residente. Resultados: Participaron 50 residentes (93%). A dos semanas del huracán, solo 42% tenían agua, 10% luz y 2% internet en el hogar. Tres residentes tuvieron pérdidas mayores o totales en su hogar. Varios ayudaban a familiares con los gastos aumentados. Las respuestas a las preguntas qué es lo más que te preocupa, qué se puede hacer mejor para tu bienestar y para el bienestar de los pacientes revelaron que para los residentes su bienestar estaba ligado al de los pacientes; y que trabajar en equipo les ayudaba a enfocar. Análisis: Cambiar el sistema de rotaciones tradicionales a un sistema de tres super equipos, cada uno quedándose en el hospital por 24 horas seguido de dos días libres, facilitó el descanso y que los residentes pudieran atender responsabilidades personales y familiares. Los residentes consistentemente señalaron que el trabajo en equipo, la solidaridad de pares, el apoyo de la facultad y el agradecimiento por su labor les ayudaron a manejar el estrés y disminuir el agotamiento emocional. Conclusión: La evaluación de bienestar utilizando las destrezas de coaching reveló la magnitud del impacto de María en los médicos-residentes; y las estrategias que les ayudaron a superar la crisis. El trabajo en equipo, la solidaridad entre pares, la gratitud y el reconocimiento de logros fueron importantes para lograr resiliencia. Estos hallazgos pueden ser importante al diseñar programas educativos orientados al bienestar de los médicos-residentes.

**2105 Brigadas Salubristas: Iniciativa de trabajo Intersectorial y participación comunitaria académica**  
*Heriberto A Marín Centeno*

Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Trasfondo y Objetivos: Las Brigadas Salubristas es una iniciativa de naturaleza interprofesional e intersectorial que tiene sus inicios en la respuesta de ayuda humanitaria tras la destrucción de los huracanes Irma y María en Puerto Rico. Metodología: Se organizaron brigadas compuestas por estudiantes, facultativos y personal no docente de las diferentes escuelas del Recinto de Ciencias Médicas. Las brigadas combinaban clínicas de salud en centros comunales o canchas con visitas casa a casa para impactar la población general y a las personas enfermas y/o encamadas. Elemento esencial de las brigadas era el trabajo en equipo interdisciplinario de profesionales y estudiantes de diversos campos, a saber: Salud Ambiental, Educación en Salud. Medicina, Medicina Dental, Farmacia, Salud Pública, Enfermería, Trabajo Social, Psicología, entre otros. Resultados: Entre los meses de octubre del 2017 a febrero del 2018 las brigadas impactaron cientos de

personas y familias en comunidades en los municipios de Adjuntas, Bayamón, Cabo Rojo, Caguas, Corozal, Jayuya, Juncos, Ponce, Villalba, Utuado y Yabucoa. Los servicios ofrecidos incluyeron: promoción de la salud, educación en salud, provisión de agua y alimentos, vigilancia de la calidad del agua, provisión de filtros de agua, entrega de medicamentos, entrega de luces solares, vacunaciones, clínicas médicas y dentales, consejería en salud, atención a adultos de mayor edad, entrega de repelentes de mosquitos, y otros. Conclusiones: Las Brigadas Salubristas han representado una respuesta salubrista de carácter interdisciplinario e intersectorial ante el desastre de los huracanes Irma y María que logro insertar a la Universidad en su rol de activismo social de manera directa viabilizando la participación de docentes, estudiantes y trabajadores universitarios en general en el quehacer de la respuesta en salud pública. Agradecimiento: No se utilizaron fondos externos ni tampoco hay conflicto de interés que declarar.

**1707 Setenta años después (1947-2018): Valoración de la situación de la disciplina y la profesión de Educación en Salud en Puerto Rico desde las voces de sus protagonistas**

*Hiram V Arroyo, Jayleen M Malavé Cartagena*

Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

La Educación en Salud cobra fuerza como disciplina y clase profesional en Puerto Rico a partir de la década del cuarenta. Durante esos años surgen las estructuras y los programas gubernamentales de Educación en Salud, se impanta el programa graduado de Educación en Salud en la UPR y se establecen los cimientos para la institucionalización de la Asociación de Educadores en Salud de Puerto Rico en el 1952. El desarrollo histórico de la Educación en Salud en Puerto Rico ha tenido una ruta ascendente caracterizada por la evolución de los roles y funciones del profesional, la variabilidad del escenario laboral, el surgimiento de reglamentación profesional y la proyección internacional del programa. El objetivo general de este trabajo es ofrecer una valoración de la situación actual de la Educación en Salud en Puerto Rico por parte de los profesionales que se encuentran en la práctica. Se describen las funciones del profesional, las metodologías de Educación en Salud dominantes, las necesidades de capacitación profesional, las condiciones laborales y los desafíos de la profesión, entre otros asuntos. Se realizaron entrevistas semi estructuradas a cuarenta y tres profesionales de Educación en Salud. Las entrevistas fueron realizadas los años 2015 (14), 2016 (15) y 2017 (14). Las entrevistas fueron realizadas por estudiantes graduados como parte de una actividad instruccional del Curso Fundamentos de Promoción de la Salud y Educación para la Salud I (EDSA 6401). Los resultados del trabajo evidencian la contribución social, institucional y programática del campo de la Educación en Salud. Se identificaron los desafíos de la profesión y las implicaciones para los sectores gubernamental, privado, comunitario y académico.

**1759 Public policy is needed for the prevention of childhood obesity in Puerto Rico**

*José A Capriles Quirós, MD, MPH, MHSA<sup>1,2</sup>; Rosa V Rosario Rosado, DrPH, MS<sup>1,3,4</sup>; Mahmoud Aboukheir, MPH<sup>1</sup>; Madeline Reyes García, MD, MPH<sup>4</sup>; Nivia Fernández, EdD, RD, LND<sup>4,5</sup>; Cruz M Nazario, PhD<sup>1,2,3,4</sup>*

<sup>1</sup>Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Yale Global Health Leadership Institute (GHLI); <sup>3</sup>Eastern Caribbean Health Outcomes Research Network (ECHORN); <sup>4</sup>Yale Transdisciplinary Collaborative Center for Health Disparities Research focused on Precision Medicine (TCC); <sup>5</sup>University of Puerto Rico, Rio Piedras Campus, PR

Public Policy Analysis: Prevention of childhood obesity in Puerto Rico. Theoretical Framework: Epidemiological studies document a high prevalence of childhood obesity (CO) in Puerto Rico. The GHLI and ECHORN facilitated a multidisciplinary delegation that concluded that Puerto Rico lacks a policy statement for the prevention of childhood obesity. Sources of Information: Representatives of local community stakeholders. Research Methods: Roundtables discussions. Findings: Stakeholders targeting different sectors of the community were represented (n=39). Over 87% address directly the obesity problem. Recommendations to deal with the CO problem include education and dissemination of information, creation of a resources database, improve the availability and access to healthy foods and physical activity, and the formulation of CO prevention policy. Implications: The recommended strategies were directed to the formulation of legislation that consider previous experience attending the obesity problem, coverage of nutritional services by health insurances, the formulation of legislation to educate municipal majors and legislators, and the implementation of legislation. It was also recommended the establishment of procedures for the implementation and monitoring for compliance with legislative measures. Measures dealing with specific products included excises to products such as sweetened beverages, control of prices of healthy food and beverages, access to water and healthy snacks in public settings such as schools and government agencies, and marketing of agricultural products in different community settings. In harmony with the information discussed above, the formulation of public policy looks to be the key. Public Policy will guide the desired outcomes and will align all collaborations to achieve healthy lifestyles and adequate nutrition in Pediatric Population. The broad areas to coverage under the policy are education and promotion, access to healthy food and physical activity, and accountability. Acknowledgements: Other GHLI members (Myrna Quiñones MD and Geoffrey Soybel MPH), NIHMD 58849938-ECHORN, 1U54MD010711-01 (REVISED)-TCC, Fundación El Ángel.

**1746 Making Assistive Technology Accessible for Community-Living Older Hispanics with Functional Limitations: A Feasibility Study**

*Edith M López Lugo, Elsa M Orellano Colón, Johan D Ortiz Torres, Stephanie Harrison Cruz, Stephanie Ramos Peraza, Alexandra Meléndez Ortiz, Janice Rodríguez Marrero*

University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Striking health disparities in the presence of disabilities is observed in older Hispanics living in P.R., since they have a much higher prevalence of functional limitations compared to older adults of any race and ethnicity living in the U.S. Assistive technology (AT) has proven effective in preventing functional limitations. However, there is a lack of community-based AT preventive interventions for older Hispanics. To address this gap, an Assistive Technology self-management intervention (VIVE-AT: *Viviendo las Ventajas de la Asistencia Tecnológica*) was developed, which was tested for its feasibility in this study with regard to: recruitment, retention, adherence, and preliminary efficacy of the intervention. Methods: A mixed-method intervention design was used by recruiting ten Hispanics aged 65+ to be enrolled in an 8-week group program delivered once a week by trained facilitators. Quantitative measures of recruitment, retention, and adherence were used. To test the preliminary efficacy of VIVE-AT, pre and post outcome measures of quality of life, global health, self-efficacy, and performance difficulties as well as qualitative thematic content analysis of the impact of the intervention were assessed. Results: Recruitment, retention, and adherence were high. Pre and post mean differences were observed in performance difficulties. Quality of life was rated high after the intervention. Emerging outcomes from the qualitative data included new knowledge and skills, enhanced performance, participation, and self-efficacy, increased safety, and increased willingness to use AT. Conclusions: The results revealed that the program was feasible and showed promise in increasing older Hispanics' safety and quality of life, while decreasing performance difficulties in daily activities. Future directions include the revision of the intervention and a randomized controlled trial to test the VIVE-AT effectiveness. Acknowledgements: This research was supported by the NIMHD [R25MD007607]. Approved by IRB A4120316.

**1786 Patient Centered Medical Home in Federally Qualified Health Centers in Puerto Rico: Challenges and Opportunities**

*Valeria M Salgado<sup>1</sup>, Hillary Edwards<sup>2</sup>, C Daniel Mullins<sup>2</sup>*

<sup>1</sup>University of Puerto Rico, Medical Sciences Campus;

<sup>2</sup>University of Maryland School of Pharmacy, Baltimore

Objective: To document whether Patient Centered Medical Homes (PCMH) in Puerto Rico offer care according to best

practices, as well as perceived challenges and opportunities for this model of care. Methods: A self-assessment questionnaire was developed consisting of two parts, based on the Joint Principles of PCMH and the Attributes and Functions defined by the Agency for Healthcare Research and Quality. The first part of the assessment consists of a rating scale from 1 (need to improve) to 3 (complete compliance) of each of the principles described. The second part of the assessment consists of open-ended questions to provide context to the answers provided, as well as inquire into challenges and opportunities for PCMH in Puerto Rico. The Asociación de Salud Primaria de Puerto Rico (ASPPR) provided contacts for 21 Federally Qualified Health Centers (FQHC) in Puerto Rico. Results: Nine FQHC participated in the study. Six were PCMH recognized, while 3 were not. On average facilities rated themselves over 2.5 on the 6 principles inquired about. The results differed by region and PCMH recognition status, but no significant differences were observed for between the groups. Patterns were determined for open ended questions as well as certain deviations from these patterns. Conclusion: FQHC in Puerto Rico perceive themselves to provide primary care according to PCMH best practices, as defined by this study. There is a need for further research and improvement on PCMH practices in Puerto Rico.

**2193 Effects of Summer Internship and Follow-up Distance Mentoring Programs on Middle and High School Student Perceptions and Interest in Health Careers**  
*Wilfredo E De Jesus Monge<sup>1</sup>, Craig Locatis<sup>2</sup>, Richard Maisiak<sup>3</sup>, Wei Li Liu<sup>2</sup>, Emma Fernandez Repollet<sup>1</sup>*

<sup>1</sup>Center for Collaborative Research in Health Disparities, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>National Library of Medicine/National Institutes of Health, Bethesda, MD, USA; <sup>3</sup>School of Medicine, University of Alabama at Birmingham, Birmingham, AL, USA

**Background & Objectives:** Minorities are underrepresented in health professions and efforts to recruit minority students into health careers are considered a way to reduce health disparities. However, there is little research about the effectiveness of these programs, other than satisfaction. The objective of this study was to measure program effects on student understanding of and interest in health careers. The significance of this innovative study is that it supports the development of the next generation of biomedical scientists and health professionals. Methods: After approval by IRB, students took a career interest inventory, completed a scale measuring their self-reported understanding and interest in health careers, and wrote essays about health careers before and after completing a one week on campus internship on health careers and after a nine month follow up distance mentoring program where they continued to interact with university faculty

by videoconference about career options. Changes in inventory, scale, and essay scores were analyzed for changes over time using Wilcoxon and Mann-Whitney tests. Results: Inventory scores were unchanged over time, but scale and essay scores trended upward significantly post internship and mentoring. Conclusion: Health career education and mentoring programs can positively affect student knowledge of health careers and their attitudes about them. The study's methods extend measures of program impact beyond satisfaction. In conclusion, programs like ours may improve recruitment of minority students into health careers, a significant contribution toward eliminating health disparities. Acknowledgments: National Institutes of Health (NIH) contract numbers HHSN276201500219P, HHSN276201500493P, and the NIH Intramural Research Program.

**1835 Evaluation of the Dissemination and Implementation of a National Colorectal Cancer Screening Program among Primary Care Physicians in Puerto Rico**

*Walter Morales Borrero, MD<sup>1</sup>; Marievelisse Soto Salgado, DrPH, MS<sup>1</sup>; Hendrick Pagan Torres, MD<sup>2</sup>; Marcia Cruz Correa, MD, PhD<sup>1,3</sup>*

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan PR; <sup>2</sup>VA Caribbean Healthcare System, San Juan, PR; <sup>3</sup>University of Puerto Rico Comprehensive Cancer Center, San Juan, PR

**Background/Objectives:** Colorectal cancer (CRC) is among the most prevalent malignancies worldwide with an associated high mortality, despite current improvements in management and screening programs. Given an increase on early-onset CRC, the Puerto Rico (PR) Health Department issued the Ordinance 334, which promotes CRC screening beginning at 40 years of age with Fecal Immunochemical Testing (FIT). Since its approval in March 2015, primary care physicians (PCP's) throughout PR have been informed of its recommendations. However, its dissemination and impact on the daily practices of CRC screening among PCP's has not been formally evaluated. The aim of this study was to evaluate the knowledge and implementation of the Ordinance 334 among PCP's and potential barriers for adherence. Methods: A cross-sectional study employing the use of an anonymous survey answered by PCP's recruited at various medical conventions held throughout PR during 2017-2018. Study approved by IRB (#A2210317). Results: A total of 150 participants were recruited with mean age of 42 ( $\pm 14$ ) years. 56.7% were males. Most of the participants were residents (30.2%) and general physicians (28.9%). Only 42% of participants were aware of the Ordinance 334. Of these, 89% are employing FIT as the initial CRC screening tool beginning at 40 years of age. Among PCP's not engaging FIT, the most common reasons for non-adherence were: health insurance disapproval on CRC screening among persons younger than 50 years and decisions regarding CRC screening strategies

being based on recommendations from international agencies such as USPSTF and ACS. Conclusion: Preliminary results suggest that most PCP's are not aware of the Ordinance 334 which may result in CRC screening delay. Efforts to increase dissemination throughout PR and address barriers for implementation of the Ordinance 334 are warranted. Acknowledgements: This research was supported by the PR Colorectal Cancer Coalition, UPRCCC and U54 NCI Award Number CA096297/CA096300.

**2210 Dimethyl fumarate decreases cathepsin B release from HIV-infected macrophages**

*Lester Rosario<sup>1</sup>, Krystal Colón<sup>1</sup>, Gabriel Borges<sup>1</sup>, Loyda Meléndez<sup>1,2</sup>*

<sup>1</sup>Department of Microbiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>RCMI Translational Proteomics Center

**Background & Objectives:** HIV-associated neurocognitive disorders (HAND) are prevalent in ~50% of HIV-positive patients, despite antiretroviral therapy (cART). During HIV infection of macrophages, the lysosomal protein, cathepsin B, is secreted and induces neurotoxicity. Cathepsin B is increased in plasma and post-mortem brain tissue from patients with HIV-associated dementia. Oxidative damage increases in HIV-infected patients while antioxidants are decreased in HIV dementia. Dimethyl fumarate (DMF), an antioxidant, has been reported to reduce HIV replication and neurotoxicity mediated by macrophages. We hypothesized that DMF would reduce cathepsin B secretion by preventing oxidative stress in macrophages. **Methods:** Monocyte-derived macrophages (MDM) were isolated from healthy donors, inoculated with HIV-1ADA, and treated with DMF. Cathepsin B secretion was assessed from HIV-infected MDM supernatants at 12 days post-infection (p.i.) using ELISA. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) levels were measured from whole cell lysates and supernatants at day 12p.i. **Results:** Treatment with DMF reduced HIV replication and cathepsin B secretion from HIV-infected MDM. However, intracellular H<sub>2</sub>O<sub>2</sub> levels were not affected by HIV infection at day 12pi, and cathepsin B levels did not correlate with H<sub>2</sub>O<sub>2</sub> levels. Although HIV infection did not alter intracellular H<sub>2</sub>O<sub>2</sub> levels, DMF treatment decreased intracellular H<sub>2</sub>O<sub>2</sub> levels in HIV-infected MDM. **Conclusions:** Thus, our results suggest that cathepsin B secretion from HIV-infected MDM is mediated by a mechanism different from oxidative stress and, thus, the mechanism by which DMF reduces cathepsin B secretion from HIV-infected MDM remains unknown. Therefore, DMF represents a potential strategy against HIV-induced cathepsin B neurotoxicity in HAND. **Acknowledgements:** This research was supported in part by: R25-GM061838 (LR, KC), R01MH083516 (LMM) G12RR03051 (LMM), R25-GM082406, SC1GM11369-01 (LMM), and University of Puerto Rico School of Medicine and Biomedical Sciences Deanships.

**1734 Novel Damaging IRF6 Mutation in a Van der Woude Family from Puerto Rico**

*Ada M Torañó Rodríguez<sup>1</sup>, Tamara Busch<sup>2</sup>, Carolina Bello<sup>1</sup>, N Debs<sup>1</sup>, Augusto Elias<sup>1</sup>, MI Salcedo<sup>1</sup>, LM López Del Valle<sup>1</sup>, M Soto Ortiz<sup>2</sup>, JF Cordero<sup>3</sup>, ML Marazita<sup>4</sup>, Jeffrey Murray<sup>2</sup>, Azeez Butali<sup>5</sup>, Carmen Buxó<sup>6</sup>*

<sup>1</sup>School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Dept. of Pediatrics, University of Iowa, Iowa City, Iowa, USA; <sup>3</sup>Dept. of Epidemiology and Biostatistics, University of Georgia, Athens, Georgia, USA; <sup>4</sup>Oral Biology, Human Genetics, University of Pittsburg, Pittsburg, Pennsylvania, USA; <sup>5</sup>Dept. of Oral Pathology, Radiology and Medicine, University of Iowa, Iowa City, Iowa, USA

**Background & Objectives:** Cleft lip and palate (CL/P) is the second most common congenital birth defect and can be classified as syndromic/nonsyndromic. About 30% of orofacial clefts are syndromic. The most common syndrome associated with orofacial clefts is Van der Woude Syndrome (VWS) (119300). This syndrome is caused mostly by mutations in the IRF6 gene, accounting for about 75% of the cases. **Methods:** In this study, 22 Puerto Rican proband (child) samples with CL/P were analyzed using Sanger sequencing. A novel IRF6 mutation was found in a proband with cleft in the hard palate. This was verified by reverse sequencing of the proband and by sequencing DNA from the parents. **Results:** The novel damaging IRF6 mutation was confirmed in both, the mother and the proband, demonstrating a hereditary pattern, and the presence of VWS was confirmed in the family. Both presented with lip pits, though the proband presented a shallow lip pit phenotype. The IRF6 mutation resulted in an amino acid change from phenylalanine to tyrosine in the position 36 (F36Y). It is in the protein binding domain and expands the genotype/phenotype correlations for IRF6 and VWS (Leslie et al, 2013). According to Polyphen/SIFT, this mutation is predicted to be deleterious or probably damaging. One other amino acid change at position 36 in VWS has also been reported (F36Y). **Conclusion:** It is important to identify mutations in this gene since they are more common in VWS which has a higher recurrence rate for CL/P than for non-syndromic CL/P. Also, if the parent of the proband is affected or has an IRF6 pathogenic variant, the risk to the siblings of inheriting the pathogenic variant is increased by 50%. This information is essential for accurate genetic counselling for families. **Acknowledgements:** This research was supported by NIH grants: K99DE024571, S21MD001830, R37DE008559, and U54MD007587.

**1800 Comparison of the effectiveness of hyaluronic acid, platelet-rich plasma, and plasma-rich in growth factors on the treatment of temporomandibular joint osteoarthritis. A systematic review**

Francisco J Carrillo, DDS<sup>1</sup>; Gonzalo Sader, DDS<sup>1</sup>; Brayann O Aleman, DDS<sup>1</sup>; Oelisoa Andriankaja, DDS, MS, PhD<sup>2</sup>; Lidia M Guerrero, DMD, FACS<sup>3</sup>; Augusto Elias, DMD, MSD, DHC<sup>4</sup>

<sup>1</sup>Resident, Department of Oral and Maxillofacial Surgery, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Center for Clinical Research and Health Promotion, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Director Head, Department of Oral and Maxillofacial Surgery, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>4</sup>Assistant Dean of Research, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Purpose:** Hyaluronic acid (HA), platelet-rich plasma (PRP) and plasma-rich in growth factors (PRGF-Endoret) have been shown to be effective in the management of temporomandibular joint osteoarthritis (TMJ OA) symptoms. We performed a systematic review to compare which of these three interventions is more effective in improving joint pain and maximum mouth opening (MMO), and decreasing joint sounds in adult patients with TMJ OA. **Methods:** Using the Preferred Reporting Items for Systematic Reviews and Meta analyses (PRISMA) statement, we searched the NCBI PubMed and Scopus databases for clinical trials and cohort studies; additional records were identified through other sources. **Results:** We found 661 records, of which only ten (nine clinical trials with a total of 445 participants and one cohort study with 50 participants) met our selection criteria. The ten articles reported the use of different types of effective protocols to treat TMJ OA at different Wilkes stages, as well as comparisons of these types of interventions with or without arthrocentesis or arthroscopy. **Conclusions:** Our findings suggest that HA, PRP and PRGF-Endoret interventions, with or without arthrocentesis or arthroscopy, are effective in significantly improving TMJ OA symptomatology at different Wilkes stages. Moreover, the obtained data suggests that PRP and PRGF-Endoret are more effective than HA in decreasing joint pain, increasing MMO and decreasing joint sounds in adult patients. Although more standardized studies are required to prove this hypothesis in a meta-analysis, our review contributes to the literature by showing the effectiveness of these interventions and their long term stability on the minimally invasive management of TMJ OA.

#### **1820 Reduced Health Disparities in Dental Preventive Services among 12-year-old Puerto Ricans**

Juliana A Iral Pineda, DMD<sup>1</sup>; Rosana Hanke Herrero, DMD, MSD<sup>2</sup>; Oelisoa M Andriankaja, DDS, MS, PhD<sup>2</sup>; Milagros J Toro Arrivillaga, DDS, MSD, PhD<sup>2</sup>; Sona Rivas Tumanyan, DMD, DrPH<sup>2</sup>; Augusto R Elias Boneta, DMD, MSD<sup>3</sup>

<sup>1</sup>Pediatric Dentistry Resident, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Associate Professor, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Assistant Dean of Research, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Purpose.** Assess the overall prevalence of pit-and-fissure sealants (PFS), among 12 year olds residing in Puerto Rico in 2011 and explore the impact of Government Health Insurance (GHI) on the prevalence of sealants on first molars, among private and public school attendees in 1997 and 2011. **Methods.** In this cross-sectional study, a probabilistic sample of 1,587 12-year-olds enrolled in school during 2011 was used, stratified by 1997 GHI regions, school type, and sex. Calibrated examiners conducted visual and tactile evaluation for the presence of PFS on at least one permanent first molar. Logistic regression models were used to compare prevalence of PFS by school type in 1997 and 2011, adjusting for sex and region; Odds ratios (OR) and 95% confidence intervals (CI) were reported. **Results.** Sex and type of school distribution was similar in 1997 (49% female, 18% from private schools) and 2011 (53% female; 23% from private schools). Between 1997 and 2011, the prevalence of PFS increased among all (4.3% vs. 18%), as well as in private (11% vs. 25.8%), public-rural (3.4% vs. 16.3%) and public-urban schools (2.5% vs. 16.8%). Children from public-rural and public-urban schools were less likely to have sealants both in 1997 (OR<sub>public-rural</sub>=0.19, 95% CI: 0.08-0.46; OR<sub>public-urban</sub>=0.17, 95% CI: 0.06-0.48) and in 2011 (OR<sub>public-rural</sub>=0.57, 95% CI: 0.33-0.98; OR<sub>public-urban</sub>=0.60, 95% CI: 0.39-0.93), compared to those from private schools. **Conclusions.** The prevalence of PFS among 12-year-old schoolchildren in Puerto Rico increased between 1997 and 2011, probably due to the increase access provided by the government health insurance, but the disparity between children enrolled in public and private schools was reduced compared to 1997, however, the gap persists suggesting that other social determinants could play a role in the use of primary prevention programs. **Acknowledgements:** This project was partially supported by NIH S21MD001830 and Colgate Palmolive (Caribbean).

#### **2019 Exonic and Intronic Novel Variants in GRHL3 from Puerto Ricans with Cleft Palate**

Carolina Bello<sup>1</sup>, Tamara Busch<sup>2</sup>, Ada Torano<sup>1</sup>, Natalio Debs<sup>3</sup>, Maria I Salcedo<sup>3</sup>, Lydia M López<sup>3</sup>, Ricardo Ledesma<sup>3</sup>, Mairim Soto<sup>3</sup>, José F Cordero<sup>4</sup>, Mary L Marazita<sup>5</sup>, Jeffrey Murray<sup>2</sup>, Azeez Butali<sup>6</sup>, Carmen Buxó Martínez<sup>3</sup>

<sup>1</sup>School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Dept. of Pediatrics, University of Iowa, Iowa City, Iowa, USA; <sup>3</sup>Dental and Craniofacial Genomics Unit, School of



Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>4</sup>Dept. of Epidemiology and Biostatistics, University of Georgia, Athens, Georgia, USA; <sup>5</sup>Oral Biology, Human Genetics, University of Pittsburgh, Pittsburgh, Pennsylvania, USA; <sup>6</sup>Dept. of Oral Pathology, Radiology and Medicine, University of Iowa, Iowa City, Iowa, USA

**Background and Objectives:** In Puerto Rico, the prevalence of cleft palate (CP) is 6.3 per 10,000 live births (2001-2013). A recent genome-wide association study (GWAS) reported a significant association of a missense variant in *GRHL3* to non-syndromic cleft palate (nsCP). Our study aimed to identify *GRHL3* variants in Puerto Ricans with nsCP. **Methods:** DNA samples from an ongoing case-control study (n=398) of families were selected. Cases were recruited from children or probands with nsCL/P (n=199) ages 0-14 years. We collected DNA samples of nsCP probands (n=52) for Sanger sequencing to study *GRHL3* variants. We also sequenced the regions of variants in *PAX7*, *ARHGAP29*, *IRF6*, *FOXE1*, *VAX1*, *BMP4*, *ADCY9*, and *MAFB*. Results were confirmed by reverse sequencing, including sequencing of the parents. **Results:** Six missense mutations, including one novel, a novel frameshift mutation, and a novel intronic mutation were identified in *GRHL3*. A novel missense variant in G473V (glycine to valine), located in exon 11, was found on a proband and mother. Although predicted "tolerated" by SIFT and "benign" by PolyPhen, it may have a biological impact to be determined in the future. We also identified a novel 4bp heterozygous deletion mutation in exon 9 that replaces a cysteine with a stop codon, (Cys365Stop), causing a frameshift on a proband. A novel intronic single nucleotide polymorphism (SNP) (C/T) was identified on two different families (proband and one of the mothers). Multiple sequence alignment (UCSC BLAT) showed it to be conserved in 8 out of the 9 species, suggesting it has evolutionary importance. **Conclusions:** Our findings contribute to the limited knowledge about the etiology of nsCP and serve as potential risk factors to aid in genetic counseling, especially in this Hispanic population. **Acknowledgements:** This research was supported by NIH grants K99DE024571, S21MD001830, R37DE008559, and U54MD007587.

**2127 Rare Mutations in ADCY9 from Puerto Ricans with Orofacial Clefts**

*DA Rodriguez Narvaez*<sup>2</sup>, *J Standley*<sup>4</sup>, *Carolina Bello*<sup>2</sup>, *Ada Torano*<sup>2</sup>, *N Debs*<sup>2</sup>, *MI Salcedo*<sup>2</sup>, *L Garcia Fragosos*<sup>5</sup>, *LM López Del Valle*<sup>7</sup>, *M Soto Ortiz*<sup>7</sup>, *JF Cordero*<sup>6,8</sup>, *A Butali*<sup>3</sup>, *J Murray*<sup>4</sup>, *ML Marazita*<sup>1</sup>, *CJ Buxó Martínez*<sup>2</sup>  
<sup>1</sup>Oral Biology, Human Genetics, University of Pittsburgh, Pittsburgh, Pennsylvania, USA; <sup>2</sup>School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Dept. of Oral Pathology Radiology and Medicine, University of

Iowa, Iowa, USA; <sup>4</sup>Dept. of Pediatrics, University of Iowa, Iowa, USA; <sup>5</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>6</sup>Dept. of Epidemiology and Biostatistics, University of Georgia, Athens, Georgia, USA; <sup>7</sup>School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Objectives:** Adenylate cyclase 9 (*ADCY9*) was previously identified in China as a recent susceptibility locus associated with non-syndromic cleft lip with/without cleft palate (nsCL/P). Approximately 16 babies/10,000 (live births) were born in Puerto Rico (PR) with nsCL/P (2014). The study objective was to identify rare/novel *ADCY9* functional variant mutations in Puerto Ricans with nsCL/P. **Methods:** Children with nsCL/P (n=398) ages 0-14 years were recruited as cases from an ongoing case-control study of Puerto Rican families. Genetic variants were identified using probands (children) DNA samples by Sanger Sequencing of *ADCY9*. We also sequenced the regions of variants in *PAX7*, *ARHGAP29*, *IRF6*, *FOXE1*, *VAX1*, *BMP4*, and *MAFB*. The distribution of likely functional variant mutations seen in case families was compared to controls families and a Discrimination of functional variants was performed. **Results:** Twelve *ADCY9* functional variants of possible functional importance were identified: seven missense, one splice site, and four synonymous mutations. Three mutations were found in exon 2, two in exon 7, and one each in exons 4, 9 and 11. Missense/probably damaging mutations: rs52791170/K564Q (MAF=3.6% / 1.9% controls) and rs372048350/A811V (MAF=0.29% / 0.01% controls) was reported once and not identified in PR. The rs61731442/T236A (MAF=0.29%) missense mutation predicted as deleterious has not been found in PR, and 3 times (MAF=0.48%) in European Americans (EA). The rs113187435/S661G (MAF=0.29% / 0.74% controls) missense mutation was predicted as benign/tolerated and has not been found in PR and EA. One missense/benign mutation was found in 66 cases (MAF=23% / 28% controls). Additionally, four known synonymous mutations were found. **Conclusion:** Identification of rare mutations in admixed populations such as Puerto Ricans may contribute to the list of variants in *ADCY9* contributing to the etiology of nsCL/P. Support Funding Agency/Grant Number: NIH grants: K99DE024571, R37DE008559, R25RR017580, U54RR026139, and U54MD007587.

**2194 Effect of the overexpression of miRNA 142-3p on AC9 in human salivary gland cells**

*J Rodríguez Ramos*<sup>1</sup>, *C Buxó Martínez*<sup>1</sup>, *J Cortes Trancoso*<sup>2</sup>, *I Alevizos*<sup>2</sup>  
<sup>1</sup>Dental and Craniofacial Genomics Core, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>National Institutes of Health, National Institute of Dental and Craniofacial Research, Sjögren's Syndrome Clinic

**Background & Objectives:** Autoimmune diseases (ADs) represent a broad spectrum of chronic conditions that may afflict specific target organs or multiple systems and impose a significant burden on quality of life. Sjögren's syndrome (SS) is an autoimmune epithelitis that affects the exocrine glands, mainly the lachrymal and salivary ones, with a functional impairment that usually presents as persistent dryness of the eyes and mouth. SS is a progressive disease characterized by a complex pathogenesis requiring a predisposing genetic background and involving immune cell activation and autoantibody production. Cyclic AMP (cAMP) is a ubiquitous second messenger that regulates diverse cellular functions, such as exocrine gland secretion and that can be generated by intracellular adenylyl cyclases (AC) or delivered from donor cells to recipient cells through gap junctions. The objective of this study was to evaluate the effect of the overexpression of miRNA 142-3p on AC9 human salivary glands to elucidate the cellular mechanisms involved in SS. **Methods:** Western blot technique and immunofluorescence assay were used to demonstrate that miRNA142-3p regulates the production of cAMP by down-regulating the expression of AC9 in labial salivary glands (LSG). The study was performed in duplicates for both techniques using increasing concentrations of miRNA142-3p, from 2nM to 50nM. **Results:** A directly proportional decrease in the production of AC9 was found in LSG cells that were overexpressed with miRNA142-3p in increasing concentrations. When overexpressing for 3H and extracting the protein 48H after neutralization significant results were found for all concentrations. Similar significant results were obtained when overexpressing for 6H except at 2nM. **Conclusions:** We anticipate this study will provide further insight into the unknown mechanisms of the described pathology; thereby promoting further research into autoimmune diseases, such as SS. **Acknowledgements:** This study was supported by the National Institutes of Health and the National Institute of Dental and Craniofacial Research.

### • Poster Presentations •

#### **1695 Prevalence of Bullying in Children with Chronic Conditions**

*Anndra González<sup>1</sup>, Coral López Prieto MD<sup>2</sup>, Nayomi Caraballo<sup>1</sup>, Lourdes García Fragoso MD<sup>2</sup>*

<sup>1</sup>University of Puerto Rico Rio Piedras Campus, PR;

<sup>2</sup>Department of Pediatrics, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Objectives:** Bullying is unwanted, aggressive behavior among school aged children that involves a real or perceived power imbalance. This behavior is repeated over time. Bullying includes actions such as making threats, spreading rumors, attacking someone physically or verbally, and excluding someone from a group on purpose. The objective of our study was to

determine the prevalence of bullying in children with chronic diseases since they are more prone to depression, anxiety and failure in treatment of their medical conditions. **Methods:** An anonymous survey was handed-out to children 8-20 years of age visiting the University Pediatric Hospital outpatient clinics. The survey included questions regarding demography, medical condition and experience with bullying. The study was approved by the Institutional Review Board. **Results:** A total of 30 subjects were recruited in which 7 (23%) were bullied but none were due to their medical condition; and only 1 of those 7 received medical treatment for their condition at school and didn't stop treatment. Additionally, all bullied subjects were teenagers (ages 15-20); most of the bullying occurred at recess (57%) or in class (43%) and when asked specifically what type of bullying 57% mentioned name-calling, 43% broken school materials, 28% physical harm and 28% being ignored. **Conclusions:** Children with chronic diseases experience bullying at school although not necessarily related to their medical condition. These children and their parents need to be aware of laws protecting children from bullying in Puerto Rico and resources in the community and in schools to address the problem.

#### **1705 SBAR Method for Improvement of Transmission of Information in the University Pediatric Hospital: A Quality Improvement Project**

*Karla Cay Martínez, MD<sup>1</sup>; Carolina Currais, MD<sup>1</sup>; Natalia L. Rodríguez Vázquez, MD<sup>1</sup>; Yasmín Pedrego, MD<sup>2</sup>*

<sup>1</sup>Pediatrics Resident, Pediatrics Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Associate Professor, Pediatrics Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Introduction:** Hospitals are complex structures that use a multilayered approach to communication. Ineffective care transition processes lead to adverse events and higher hospital readmission rates and costs. In recent years, medical handover has been identified as an increasingly important area for hospitals to improve upon. **Objectives:** The objective of this project was to implement the SBAR method as part of the communication process among health care professionals. Subsequently, a PDSA cycle was developed in which the SBAR tool was presented and executed until improvement in usage has been achieved. **Methods:** After establishing deficiencies between staff when communicating patient situations and identifying the grounds for education, a Pediatric Ward was selected for short educational interventions to improve communication among staff with SBAR technique. **Results:** The initial needs assessment was configured to acquire pages answered from the entire hospital. Analysis of results led that only 4.6% calls met the criteria established for adequate SBAR utilization. After implementing the educational intervention, results reported that

25% were answered with a complete SBAR communication technique. Conclusions: The educational program provided to the staff of the Pediatric Ward led us to analyze the efficacy of this intervention. Results demonstrated an improvement in communication between personnel. Acknowledgements: The authors of this project would like to thank all the nursing and medical staff of the University Pediatric Hospital for participating in this Quality Improvement Project.

**1710 Clinical and Demographic Profile of Patients Receiving Benzodiazepines for the Treatment of Anxiety Disorders at a Specialized Center in Puerto Rico**

*Roberto León Barrera, BS; Estefanía Quiroz Herrera, MD; Karen Martínez González, MD*

Psychiatry department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background: Anxiety disorders are those characterized by excessive fear, anxiety, and related behavioral disturbances. Despite the high prevalence of these disorders among Hispanics and Latinos, there are marked health disparities in access to high quality evidence-based treatments. Benzodiazepines are among the most commonly prescribed treatments for anxiety disorders. However, according to evidence-based practices, their use should be limited to the acute phase of treatment. Considering the well-known mental health care disparities among Latino and Hispanic populations, it is important to examine tendencies in benzodiazepine use. We were interested in evaluating whether benzodiazepine prescription practices in Puerto Rico follow evidence-based guidelines. Methods: We evaluated the use of benzodiazepines in 86 subjects receiving treatment for anxiety disorders from 2013 onwards at the Center for the Study and Treatment of Fear and Anxiety at the University of Puerto Rico. This cross-sectional, secondary data analysis will describe social and demographic characteristics, comorbidities, as well as the relative timing of benzodiazepine prescription. Results: Demographic analysis showed 72% of our study participants were female, 28% were male, with ages from 21-76 years. Overall, 53% of all study subjects were prescribed benzodiazepines at some point during treatment, while 47% did not receive a benzodiazepine prescription at all. Among those subjects referred for psychopharmacologic evaluation, only 39% were prescribed benzodiazepines during initial assessment. Generalized Anxiety Disorder was the principal diagnosis in 27% of subjects. However, 80 % had comorbid psychiatric conditions. Conclusion: In addition to characterizing a Hispanic study population undergoing treatment for anxiety disorders, we have highlighted that at a clinic specializing in the treatment of anxiety disorders, most patients were not initially managed with or prescribed benzodiazepine medication. We eventually hope to identify potential diagnostic or psychological factors associated with a greater likelihood of

benzodiazepine use in the treatment of anxiety. Acknowledgements: PR-CTRC Grant # U54MD007587.

**1777 Assessing the Interest, Knowledge and Confidence of Third Year Dental Medicine Students at the University of Puerto Rico Medical Sciences Campus in the Management of Deaf Patients in the Dental Practice**

*Stephanie Pastrana Sánchez, Fellow DMS-III; Ina I Negrón Zorrilla, DMD; Mitzy Pérez Velázquez, DMD; Jocelyn Medina Paneto, PhD*

School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background: Individuals who have some degree of deafness will find more difficult than individuals who have a normal hearing to understand and communicate in the world around them. This is a barrier to provide an adequate dental care. Deaf individuals are reported to have a poorer health status than the general population. Dentists should understand the need of deaf patients to have better oral health and the ways to communicate with deaf patients. Methods: Two questionnaires were given before and after workshops about the management of deaf patients in the dental practice. The first workshop consisted in a lecture about deafness, types, degrees and signs of hearing loss, methods of communication and deaf culture. The second workshop consisted of a lecture of the oral health of deaf people and the management of these patients in the dental office. The third workshop consisted in a hands-on experience about American Sign Language. The fourth workshop consisted in a visit to the Dental Clinic of the *Colegio San Gabriel* where most students have some degree of deafness. Results: The third-year dental students showed increased interest in the management of deaf patients in the dental practice. After the fourth workshops, the third-year dental students increase their knowledge about deaf community and their oral health, as well as their confidence to treat them in a dental practice. Conclusion: The students acquired a new depth of understanding in relation to this community. There is a need to educate dental students in the management of deaf patients in the dental practice to offer a better oral health care to this community. Acknowledgements: This project could be completed thanks to the support of ADEA-Academic Dental Career Fellowship Program and PRIDE from the School of Dental Medicine.

**1792 Repercusiones del Cambio Climático en la Salud Humana: Propuesta de Política Pública en PR para el monitoreo de brotes de enfermedades transmitidas por vectores**

*Karen Agosto Valentín, MPHc, JDC*

Estudiante Graduada de Epidemiología del Recinto de Ciencias Médicas de la Universidad de Puerto Rico y Estudiante de Derecho de la Universidad de Puerto Rico, Recinto de Río Piedras

Política Pública Analizada: A través del análisis jurídico y del contraste de los sistemas de vigilancia de Cuba, Panamá y Estados Unidos, con especial atención de situaciones de emergencia ante brotes de enfermedades transmitidas por vectores, se delineó una propuesta general para mitigar los efectos de dichos brotes en nuestra población. Disciplina o Teoría: En el Capítulo Cinco (5) del más reciente Informe de la Organización Mundial de la Salud, se reconoce que en Cuba y Panamá se ha trabajado el modelo del manejo ambiental y que en la actualidad, muchos países latinoamericanos han regresado a él como estrategia medular para la planificación de la prevención y del control de enfermedades transmitidas por vectores. Fuentes de Información: •En Puerto Rico, la Ley Núm. 161 de 9 de noviembre de 2007 (P. del S. 952) •En Cuba, la Ley Núm. 41 de 13 de junio de 1983 •En Panamá, el Decreto Ejecutivo Núm. 35 del Ministerio de Economía y Finanzas de la República de Panamá. Método: Se reconocen algunas de las limitaciones de nuestro sistema de vigilancia de enfermedades transmitidas por vectores y se contrastan con las propuestas de Cuba y Panamá. Hallazgos: El efecto de cambio de un (1) grado en temperatura propulsa efectos insospechados en muchas especies y provoca un cambio dramático de los climas a nivel global. En PR no estamos preparados para atender eficientemente la proliferación de enfermedades transmitidas por vectores tras condiciones de emergencia ambiental tras desastres naturales. El manejo del medio ambiente es la manera más efectiva de controlar la proliferación de vectores. Implicaciones: Aspiramos a que en Puerto Rico se adopte esta Propuesta para la implantación de Políticas Públicas en Salud dirigidas al monitoreo eficiente de brotes epidémicos de enfermedades, ante nuestra realidad ambiental que repercute y es cada vez más latente. Reconocimientos: Ninguno.

**1794 Orthopedic Surgery Residency Case Log Transition: An Analysis of ACGME Data**

*Eduardo Natal Albelo, MD<sup>1</sup>; Norberto Torres Lugo<sup>2</sup>, Roberto Colón Miranda, MD<sup>1</sup>; Antonio Otero Lopez, MD<sup>1</sup>*

<sup>1</sup>Orthopedic Surgery Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR;

<sup>2</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background and Objectives: Through the years the Orthopedic Surgery Department of the University of Puerto Rico: School of Medicine, like other programs in the nation, has tried to determine the elements that affect the academic performance of their residents. In this study we evaluate this institution for the first time, in terms of educational impact of the surgical case log of the residents. The aim is to provide a broad and comprehensive understanding of the incidence of cases and how they affect surgical education and performance. Methods: The surgical case log of the fifth-year residents of the Orthopedic

Surgery Department were evaluated in the period of 2006 to 2016. They were compared with the national mean of cases per subspecialty of the Orthopedic Surgery Programs in the United States. The case log was also associated to the Orthopedic In-Training Examination to determine the impact in the academic performance of residents. The data for this research was obtained from the Department of Orthopedic Surgery and the Accreditation Council for Graduate Medical Education database. Results: There was no statistical significance between the residents' mean case log in the institution and the Orthopedic Training Programs in the United States in any specialty. No association found between the number of cases per specialty and the performance of residents in the Orthopedic In-Training Examination. Conclusions: Our results suggest that the amount of surgical case logged have no association with the academic performance of residents. Future studies should be performed on a larger scale. Acknowledgements: We sincerely thank Claribel Rivera, Residency Program Coordinator, for their guidance in the safety and confidential management of the residents' data. Her support was essential for the progress of this project. Approved by IRB (Protocol B0110317)

**1812 Orthopaedic Surgeon Communication Skills: Perception of Empathy and Patient Satisfaction through the use of Anatomic Models**

*Edwin Portalatin, MD; Roberto Colon Miranda, MD; Ricardo Abreu, MD; Dennys Rivera Perez, BS; Luis Lojo Sojo, MD*

Background & Objective: Empathy is one of the strongest driver of patient satisfaction and it has become an important measure of patient centered care. Physicians and surgeons need to have excellent communication skills if they want to deliver high quality care; the usage of anatomical models during an outpatient visit may help with this. The objective of this cross sectional study is to determine if the usage of anatomical models during an orthopaedic appointment affects patient satisfaction and perceived empathy. Methods: A sample size of n = 304 participants was divided into a control group and an anatomical model group. Both groups were evaluated with the Consultation and Relational Empathy (CARE) Measure questionnaire at the end of each interaction. A Skewness/Kurtosis and Shapiro Wilk W test was conducted to verify for the normality of the distribution. Mann-Whitney U was used to compare the differences between the two independent groups. Categorical variables were compared and analyzed utilizing Chi square and Fischer exact tests. Results: The Median CARE score of the control group and the anatomical group was 46 and 48 respectively. Physicians ranked between the 75th and 95th percentile of empathy in the CARE Measure. No statistical significance was observed in patient satisfaction and perceived empathy, p value < 0.90. Conclusion: Our results suggest that using anatomical models during an orthopaedic appointment does not

affect patient satisfaction or the perceived empathy. Acknowledgment: This project is supported by Award Number Grants 5S21MD000242 and 5S21MD000138, from the National Center for Minority Health and Health Disparities, National Institutes of Health (NCMHD-NIH).

**1839 The Use of Oral Hypoglycemic Agents in the Management of Diabetes Mellitus During Pregnancy**

*Loida A. Gonzalez Rodriguez<sup>1</sup>, Sheila Mercado<sup>1</sup>, Josefina Romaguera<sup>2</sup>*

<sup>1</sup>Endocrinology, Diabetes, and Metabolism Division, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Obstetrics and Gynecology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Gestational Diabetes Mellitus (GDM) and Type 2 Diabetes Mellitus (DM2) are metabolic disorders characterized by increased insulin resistance. The prevalence of both conditions is increasing and associated with complications during and after pregnancy. Even though insulin is the preferred therapy in pregnant patients with DM, the prescription of oral hypoglycemic agents has been increasing among practitioners. This study aims to determine the prevalence of patients using hypoglycemic agents to manage DM during pregnancy at the University Hospital of Puerto Rico (UDH); and to evaluate maternal and neonatal outcomes with the use of these agents. **Methods:** Medical records from the Obstetrics Clinics were reviewed. Patients that were treated with metformin, sulfonylurea or insulin were included. Maternal and neonatal outcomes were compared between groups using Chi-square/Fisher's Exact and Kruskal-Wallis tests. **Results:** A total of 70 medical records were included. The patient's mean age was 28 years. The majority had GDM (91%). The most common comorbidity was hypertension (28%). During the second trimester 70% of the patients were initially treated with lifestyle modification; however, 48% required pharmacologic management during the third trimester being insulin the preferred therapy. Among the oral hypoglycemic agents, sulfonylurea was preferred. There was a non-significant increase in caesarean section, episiotomy, labor induction, and pre-term delivery among patients treated with insulin. Among neonatal outcomes, the risk of macrosomia, dystocia, and NICU admission tend to be higher with insulin, but not statistically significant. Also a non-significant increased risk for small gestational weight was observed with insulin and sulfonylurea. **Conclusion:** No statistical significant differences were found in most of the maternal and neonatal outcomes among treatment groups. However, oral hypoglycemic agents cross the placenta and further studies evaluating long terms effects in exposed children will be needed. **Acknowledgements:** This research was supported by NIMHHD NIH Award Number 2U54MD007587.

**1856 Anogenital Findings of Child Sexual Abuse in Puerto Rican Children: Revisited**

*Keysha I Pietri Mattei<sup>1</sup>, Jorge L Mejías Ramos<sup>1</sup>, Valeria Muñoz Becerra<sup>1</sup>, Tagrid Ruiz Maldonado, MD<sup>2</sup>, Brenda Mirabal, MD,MPH<sup>3</sup>, Maritza Salcedo, MD<sup>3</sup>*

<sup>1</sup>Department of Medicine, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Pediatrics, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Biopsychosocial Program, University Pediatric Hospital, San Juan, PR

**Background:** A high child-abuse victimization rate has been reported in Puerto Rico when compared to USA, amidst lower reporting rates. Victims suffer multiple types of abuse, and child sexual abuse (CSA) comprises the third most common form. Little has been documented regarding trends of anogenital findings, and it is important that health-care professionals recognize the most common, as well as their medico-legal implications. We revisit the issue in an effort to update the available literature for this population. **Methods:** Five-year records review of Puerto Rican children 0-17 y/o evaluated for CSA. Data comprising anogenital findings, epidemiologic and demographic factors were collected for frequency and bivariate analysis. **Results:** Preliminary results of 82 cases evaluated for CSA show a mean age of 8.2 years, with 41.5% of patients in the 6-12 school-age range. 34.1% reported a friend/person known to victim as the perpetrator with most complaints regarding genital contact without penetration (45%) and genitogenital/anogenital penetration (26.8% and 22%, respectively). The most common genital findings were residual trauma to external genitalia. Most patients (83%) denied physical symptoms prior to evaluation, but nearly 40% reported a history of emotional symptoms. In approximately 64% of children with emotional symptoms, allegations were confirmed. On physical findings, 83% and 67% of cases evaluated for CSA had an unremarkable general physical exam and genital exam, respectively. Interestingly, 14% of cases had positive findings suggestive of anal trauma. **Conclusions:** When compared to other studies, there appears to be a higher prevalence of findings suggestive of anogenital trauma in this population. Small sample size is a factor to consider. Nonetheless, a normal anogenital exam was the most common finding. The child's disclosure continues to be the most important element of the evaluation. Further statistical correlation of symptom history and physical findings, and additional bivariate analysis, is currently underway. **Acknowledgements:** None.

**1874 Pharmacists' Impact on Preventable Hospital Readmission Rates of High Risk Patients by offering Transition of Care Services upon Discharge in a Teaching Hospital**

*Sara M Ramos González, Christine M Raymond Biaggi, Keyla M Rivera Ruiz, Ángel R Rodríguez Rivera, Ileana Rodríguez Nazario, PharmD; José J Hernández Muñoz, PhD; Jonathan Hernández, PhD*

Background: Transitions of care involve the coordination and continuity of care as patients are moved through different settings of care. If not coordinated correctly, these could turn into vulnerable exchange points prone to adverse events that result in higher costs to the health system. Health care systems are facing economic challenges due to the suboptimal performance in these transitions, which often result in preventable medication-related problems leading to readmissions and patient dissatisfaction. Because the CMS is now penalizing hospitals in the US for exceeding readmission rates of patients with acute myocardial infarction, heart failure, pneumonia, and chronic obstructive pulmonary disease, it is imperative for hospitals to implement protocols and strategies in order to prevent readmissions. Integrating a pharmacist in transitional care by performing Comprehensive Medication Management (CMM) interventions has demonstrated great benefits. Therefore, the research project aims to determine if pharmacists' CMM interventions reduce readmission rates among high risk patients within 30-days post discharge by 10% as compared to those not receiving the intervention. Objectives: (1) Compare the number of preventable hospital readmissions within 30-days post discharge between patients receiving or not CMM interventions upon discharge; (2) Identify the number of medication-related problems within the group of patients receiving the CMM interventions; (3) Assess medication adherence levels within 30-days post discharge among patients receiving CMM interventions upon discharge; and, (4) Assess patient satisfaction over the discharge and follow-up process within 30-days post discharge among patients receiving CMM interventions. Setting: Dr. Federico Trilla Hospital in Carolina, PR. Methodology: A pre- and post- quasi-experimental design will be used to compare the number of preventable hospital readmissions between patients receiving or not the CMM intervention upon discharge. Eligible patients will be selected using a randomized sampling method making up the experimental group which will receive the pharmaceutical intervention. This group will be compared to a control group selected from the database provided by the hospital. The experimental group will be followed in time, while the control group will be analyzed retrospectively, thus measuring the variables of medication-related problems, medication adherence and patient satisfaction only in the experimental group. Descriptive statistics will be used to analyze the data obtained. A chi-square analysis will be used to compare face-to-face versus telephone interventions in the experimental group. The experimental group will be compared with the control group using a chi-square analysis as well. As a randomized experimental study, inferential statistics will be performed. Preliminary Results: Data collection for the exper-

imental group was until September 2017. Data collection for the control group is still on going.

**1880 Uso de Simulación Clínica para Desarrollar Autoconfianza y Pensamiento Crítico en Estudiantes Subgraduados de Enfermería Psiquiátrica/Salud Mental**

*Noemy Díaz Ramos, RN, EdD*

Escuela de Enfermería, Universidad de Puerto Rico  
Recinto de Ciencias Médicas, San Juan, PR

Antecedentes & Objetivos: Los escenarios de salud mental/psiquiatría son complejos e impredecibles pudiendo impactar el proceso de enseñanza y aprendizaje. Para los profesores es retante preparar a estudiantes con las destrezas y competencias necesarias por la carencia de laboratorios especializados. La situación fiscal, el aumento de estudiantes y complejidad de la salud de los pacientes, se han traducido en una reducción en la disponibilidad de lugares para realizar las prácticas. Se ha establecido que la simulación logra aumentar el conocimiento del alumno y ayuda al desarrollo del pensamiento crítico y autoconfianza. La integración de la simulación clínica como estrategia de enseñanza ofrece al estudiante la posibilidad de realizar de manera segura y controlada, una práctica análoga. El propósito de este estudio fue investigar si el uso de la simulación clínica en los cursos de enfermería psiquiátrica/salud mental promueve el desarrollo de la autoconfianza y el pensamiento crítico en los estudiantes de subgrado. Metodología: Se seleccionó el muestreo probabilístico con 40 estudiantes de Enfermería, nivel bachillerato. De 18 años en adelante, de ambos sexos; estos fueron expuestos a la simulación clínica con pacientes estandarizados. Se realizó un estudio experimental con pre y postprueba, utilizando dos instrumentos. Se analizaron los datos a través de SPSS®. Obteniendo medidas de tendencia central, estadísticas descriptivas, prueba de hipótesis. Resultados: Los resultados establecieron un aumento en la autoconfianza y el desarrollo de pensamiento crítico, luego de la exposición a la simulación clínica, ( $p < 0,05$ ). Conclusión: La simulación clínica es la respuesta para la brecha existente entre la teoría y la práctica; ofreciendo un ambiente seguro para el estudiante. A través de la repetición de la destreza, el estudiante alcanza un grado mayor de autoconfianza y pensamiento crítico. Sin embargo, se necesita más investigación al respecto de mayor jerarquía, así como también se debe incluir una muestra mayor.

**1885 Curricular Mapping to ACPE Standards 2016 Appendix 1 and NAPLEX Blueprint**

*Edna N Almodóvar Caraballo, PharmD; Jonathan Hernández Agosto, EdD*

School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Objectives: 1) To evaluate the alignment of the curriculum content with ACPE Standards 2016- Appendix 1. 2) To eva-

luate if the curriculum content addresses the revised NAPLEX blueprint competency statements. 3) To determine breadth and depth of the curriculum content when compared to Appendix 1 and NAPLEX blueprint. Methods: A curricular mapping process was conducted during the second semester of 2015-2016 for the required courses of the curriculum, the Appendix 1 Key Elements, and the NAPLEX Blueprint. Data was collected through an electronic platform, during a workshop offered to the faculty. Data was extracted and summarized from the electronic database. A tabular display of the map/cross-walk was developed and reviewed by the Curriculum Committee (CC). A descriptive analysis of the data was performed and results were presented to the faculty. Results: Faculty response rate was 85%. All Appendix 1 content areas are represented within the curriculum. Appropriate breadth and depth is suggested by the number of courses that address each key element at different years in the curriculum. All NAPLEX competency statements are represented within the curriculum, however, percentage of distribution for Area 2 is significantly lower (16%) than the 33% of weight distribution for this area in the NAPLEX. Results for Area 2 show that competency statements related to the compounding of sterile and non-sterile products (2.2.2, 2.2.3, and 2.2.5) may need to be reinforced. Conclusion: This analysis provides the basis for the correlation between students' performance on PCOA, NAPLEX and curricular alignment. Acknowledgements: We appreciate the School of Pharmacy Faculty and the Curriculum Committee participation in this study.

**1914 Acceptability, barriers, and facilitators of a preventive group intervention for self-management of functional disabilities among older Hispanics**

*Elsa M Orellano Colón, Alexandra Melendez Ortiz, Edith M Lopez Lugo, Stephany Ramos Peraza, Johan Ortiz Torres, Stephanie Harrison Cruz, Janice Rodríguez Marrero*

University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: The proportion of people 65 years and older, who have a disability and live independently, is substantially higher for older Hispanics living in Puerto Rico than for older adults living in the U.S. However, there is a lack of preventive interventions for older Hispanic to decrease functional disabilities. The aim of this study was to assess if an assistive technology self-management intervention (VIVE-AT) was feasible with regard to participants' acceptability and practicality of the intervention. Methods: We used a mixed-method intervention design. We recruited ten Hispanics aged 65+ enrolled in an 8-week group program delivered in a community context once a week by trained facilitators. Acceptability was assessed using the Participants Assessment of the Feasibility of the Intervention. Practicality was assessed by exploring the barriers and enablers for the implementation of the intervention. Results:

The intervention was scored highly in all aspects related to the activities, duration, facilitators, and application of the new learning into the participants' daily life activities and routines. Participants reported that the intervention was enjoyable, and that they felt mostly engaged and motivated. The main enablers were activity enablers such as active engagement and hands-on practice sessions and participants-facilitators positive interactions. The main intervention barriers were the complexity and inadequacy of some of the activities and contextual barriers such as exterior noises and space limitations that interfered with the delivery of the intervention. Conclusions: The results suggested that this intervention was acceptable and practical to be delivered in a group format. Future directions include the revision of the intervention and a randomized controlled trial to test the VIVE-AT effectiveness. Acknowledgements: This research was supported by the NIMHD [R25MD007607]. Approved by IRB A4120316.

**1921 Muscle Controlled 3D Printed Prosthetic Hands**

*Oswaldo Rivera<sup>1</sup>, Dessire Verges<sup>2</sup>, Abraham Schwartz<sup>3</sup>, Emma Fernández Repollet<sup>3</sup>*

<sup>1</sup>University of Puerto Rico Rio Piedras Campus, PR;

<sup>2</sup>University of Puerto Rico Humacao Campus, PR;

<sup>3</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: The BioInnovation Suite, a laboratory located in the Medical Sciences Campus of the University of Puerto Rico, has been involved in developing 3D printed prosthetic hands that are remotely controlled by electrical impulses from human arm muscles. This technology can serve patients that have lost their hand by retraining muscle function in their upper and lower arms. This project is at a Proof of Concept stage and additional applications are being explored. Methods: Several models of prosthetic hands have been produced from polylactic acid (PLA) a biodegradable polymer filament with the 3D WOX Sindoh Printer. The Raptor and Flexi-Hand prosthetic hand designs were obtained from the Internet as STL print files. These designs differ in the joint connections and mechanism of flexure. The prosthetic joints of the Raptor hand are printed as an internal rod, whereas Flexi-Hand requires separately printed joints produced from a flexible material, e.g., FilaFlex. The designs were printed using Polylactic Acid (PLA) in filament form. The remote control components consisted of a Myo Gestures Control Armband containing eight (8) separate sensors that detect electrical muscle signals, as well as 3-axis position sensors. The Myo unit connects to an Arduino micro-computer which in turn, controls five separate micro-servos to mechanically activate the individual fingers. Results: Two prosthetic hand designs were successfully printed and servos installed in a support box. The servos were wired to the Arduino computer and programs were written to activate the Bluetooth connection between the Myo unit and the

Arduino and control the individual servos. The system was initially calibrated to remotely mimic specific hand motions of the individual wearing the Myo unit. Conclusion: We have successfully demonstrated the feasibility of generating an operational Proof of Concept to remotely control 3D printed hands via a Myo armband unit. Acknowledgments: NIMHD-RCMI Grant U54-MD 007600, Deanship School of Medicine, UPR Medical Sciences Campus.

**1928 Razones preventivas y económicas: Obligatoriedad de Exámenes Dentales a escolares de Puerto Rico**

*Violeta Contreras, Luis A Avilés*

Escuela Graduada de Salud Pública y Ciencias Biosociales, Departamento de Ciencias Sociales, Universidad de Puerto Rico, Recinto de Ciencias Médicas, San Juan, PR

Política pública analizada: La ley 63 de 2017 hace obligatorio los exámenes orales y tratamientos preventivos como requisito de admisión en escuelas públicas y privadas. En el proceso de vistas públicas emergieron posiciones encontradas entre el Colegio de Cirujanos Dentistas, quien favoreció la medida y la Asociación de Escuelas Privadas de Puerto Rico quien se opuso a que la medida aplicara a sus escuelas. Disciplina o teoría: Recurrimos a la disciplina de la retórica para analizar las estrategias argumentativas de estos dos grupos. Fundamentamos la investigación en el análisis retórico de política pública realizado por Albert Hirschman en “The Rhetoric of Reform” y James Aune en su libro “Selling the free Market”. Fuentes de información: Obtuvimos seis ponencias escritas presentadas ante la Comisión de Salud y una ponencia adicional de la Coalición de Salud Oral de Puerto Rico. Métodos: Identificamos cada uno de los argumentos a favor y en contra del proyecto y buscamos cómo ellos recurren a las estrategias argumentativas planteadas por Hirschman y Aune. Hallazgos: De acuerdo a Hirschman, argumentos a favor mencionan los principios reformistas de sinergia, es decir, la prevención disminuye el ausentismo escolar, enfermedades orales y sistémicas y el carro de la historia, de no adoptarse esta medida favorecería una alta prevalencia de caries. La asociación de escuelas privadas consideró la tesis de la futilidad, al mencionar que esto no beneficia a sus escuelas directamente. Según las estrategias mencionadas por Aune, las ponencias apoyan su credibilidad a través de las estadísticas. Implicaciones para la política pública: no fue contemplado en el debate el mercado laboral de los dentistas y la disminución de la matrícula en las escuelas. Por otra parte, el Colegio de Cirujanos Dentistas debe considerar la elaboración de leyes o el ejercicio de la abogacía en salud como parte de su formación profesional.

**1959 Calculus prevalence among adults in San Juan, Puerto Rico**

*Javier A Cevallos Ramos, Milagros J Toro, Sona Rivas Tumanyan, Augusto Elías Boneta*

Background & Objectives: Dental calculus and its effect on overall health is a growing concern in adults who face risk factors that could potentially promote the development of tartar. This study aimed to estimate the prevalence and evaluate the risk factors for calculus in a group of adults from San Juan, Puerto Rico. Methods: In this representative community-setting study, 624 volunteers were evaluated by trained-calibrated examiners in 8 randomly selected regions of San Juan. Participants completed a medical history/socio-demographic/behavioral questionnaire. Clinical examinations included assessment of visible plaque (whole mouth; 6 sites/tooth), and presence of calculus (lingual, antero-inferior; 3 sites/tooth). All analysis was weighted using normalized sampling weights. Multivariate logistic regression was used to evaluate the associations between potential risk factors (age, sex, smoking, education, frequency of dental visits, tooth brushing frequency, flossing), and calculus (as outcome); odds ratios (OR) and 95% confidence intervals (CIs) were estimated. The analyses were repeated in males, females and never smokers. Results: Out of 624 (WtN=610) participants (55% women), 88.1% had calculus. The average calculus index was 60.1%, while the interproximal calculus index was 67.3%. None of the risk factors had significant association with calculus among all. Among never smokers (WtN=409), having middle or technical education (vs. university) increased the odds of calculus (adjusted OR: 1.68; 95% CI: 1.08-2.62). Among females (WtN=306), brushing  $\geq 3$  times per day (vs. twice/day) was inversely associated with calculus (adjusted OR: 0.42; 95% CI: 0.21-0.86); this association was not significant among males. Conclusion: Calculus is highly prevalent in San Juan, Puerto Rico. Educational attainment and dental hygiene were significantly associated with calculus in select subgroups. Acknowledgements: We thank the Caribbean Oral Health Initiative for promoting oral health in the Caribbean.

**1960 The politics of health: A discourse analysis of Zika virus infection and sexual and reproductive rights in Puerto Rico**

*José E Guerrero Bravo, DrPHc, MS; Carlos E Rodríguez Díaz, PhD, MPHE, MCHES*

Doctoral Program in Public Health with Specialty in Social Determinants of Health, Social Sciences Department, School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Health policy analysis - Public Policy Under Analysis: Policies related to the Zika Virus (ZIKV) epidemic pertaining to Puerto Rico in the aftermath of the epidemic. Academic Discipline and Theoretical Framework: We explored a right-based approach to health, deeming greater attention to the social determinants of health, health equity, and the power structure. We use the report issued by the World Health Organization Commission on Social Determinants of Health, as a lens through which to address these issues. Source of Information: A scope review of



policies related to the global, national, and local ZIKV epidemic was conducted. Policies pertaining to Puerto Rico were selected. Research Methods: A discourse analysis was conducted to identify how the right to health and sexual and reproductive rights have been portrayed and addressed in these policies. Findings: The relevant policies of WHO (World Health Organization), CDC (Centers for Disease Control and Prevention), and the Department of Health of Puerto Rico were analyzed. Policies implemented to Puerto Rico's public health structures were mainly made through the oversight power of US-based institutions. Efforts to control the ZIKV epidemic were focus on vector control and birth control. Most birth control recommendations were directed to women and inconsistent with the resources locally available to prevent pregnancy or sexual transmission of the virus. Policies represented a burden to women and their role in decision making for protective health practices. Limited attention was placed on structural determinants for ZIKV prevention measures, included poverty, limited access to proper reproductive healthcare, and biased sex education. Implications for Public Policy: Local policies in Puerto Rico are influenced by the colonial relationship with the United States, and as a result, lack attention to actual social determinants that increase the burden for infection and disease progression. Acknowledgement: None

**1967 Assessment of the validity of anal Pap cytology and HPV typing in the detection of anal intraepithelial neoplasia in women**

*Ramos Cartagena JM, Pérez CM, Amaya C, Guiot HM, Ortiz AP*

Background & Objectives: Anal intraepithelial neoplasia (AIN) is a precursor of anal cancer, with human papillomavirus infection (HPV) infection being one prominent risk factor. Screening for AIN is performed through anal cytology, while tissue biopsy during high resolution anoscopy (HRA) is diagnostic. This study assessed the validity of anal cytology as a screening tool for the diagnosis of AIN against HRA among women, individually and in combination with HPV typing. Methods: A secondary analysis of 126 consecutive women that attended the Anal Neoplasia Clinic of the University of Puerto Rico Comprehensive Cancer Center between 2014 and 2017 was undertaken. Sensitivity and specificity were calculated using HRA as the gold standard. The kappa statistic was used to evaluate the concordance between the two tests. Results: Out of 126 women, 80.2% had anal infection with oncogenic HPV types. AIN was detected with anal cytology and HRA in 73.0% and 82.5% of women, respectively. Measured against the results from HRA, the sensitivity of the anal cytology alone was 77.9% (95% CI: 68.7, 85.4), whereas specificity was 50.0% (95% CI: 28.2-71.8). However, the sensitivity of the two tests combined (cytology plus HPV) increased (92.3%, 95% CI: 85.4-96.6), but the specificity decreased (22.7%, 95% CI: 7.8, 45.4). The

same pattern was observed among HIV-infected women and in the detection of high-grade AIN. The concordance between anal cytology and HRA was 0.22 (p-value <0.001). Conclusion: Anal cytology in combination with HPV typing for the screening of AIN improved the detection rate of AIN.

**1976 Acquiring Clinical Skills with Standardized Patients: Integrating Qualitative and Quantitative Methods**

*Elias K Pabon, Aileen M Torres, DMD; Jocelyn Medina, PhD*

Departamento de Ciencias Restaurativas, Escuela de Medicina Dental, Universidad de Puerto Rico Recinto de Ciencias Medicas, San Juan, PR

Purpose: The use of standardized patient (SP) as a tool for the teaching of clinical skills have been widely used in medical education since the 1990's. The UPR School of Dental Medicine introduced the concept successfully in its curriculum in 2003 for medical history interviews and dental clinical examinations. The SP activity involves a general understanding of medical history concepts and assisting to lectures and seminars serving as introduction to what the student can expect from a SP and a real case patient. The SP activities begin during freshman year with medical history interviews and vital signs acquiring skills. In an effort to understand what students need to learn for real case scenarios, this research aims to study the perceptions of first year dental students toward the SP activities and how second year students feel prepared to engage in a real patient scenario using these previous experiences. Methods: Quantitative and qualitative techniques are used to analyze the perceptions and attitudes toward the SP techniques. Using a pre-test and post-test, freshmen student's perceptions were evaluated before and after the completion of the SP activity. These results are compared with the outcomes of two focus groups with sophomores' students. Discussion: The results showed improvements in cognitive and affective components in the freshmen students' survey. The obtained results from the focus groups assert the importance of giving students a hands-on experience in the dentist-patient relationship. Conclusions: In conclusion, this research reaffirms the necessity to continue SP activities for dental students as a mean to acquire clinical skills for preparation of real life scenarios.

**2012 Características de las viviendas de Puerto Rico antes del paso de los huracanes 2012-2016**

*Bianca Rosa Avilés, Paloma Rivera Ortiz, Ana Luisa Dávila Román*

Universidad de Puerto Rico, Recinto de Ciencias Médicas, Escuela Graduada de Salud Pública y Ciencias Biosociales, Departamento de Ciencias Sociales, Programa de Demografía, San Juan, PR

Introducción: La vivienda está vinculada al desarrollo socioeconómico de un país, y provee un ambiente de seguridad, es-

tabilidad y privacidad a sus ocupantes. En el 2017 Puerto Rico fue azotado por dos huracanes que se estima causaron la destrucción de 70,000 residencias, y 550,000 sufrieron algún daño lo que trastocó la vida cotidiana y lleva a repensar como enfrentar las nuevas realidades. Objetivos: El propósito de este estudio fue presentar las características de las viviendas ocupadas en Puerto Rico antes de los ciclones. Método: Esta investigación fue de carácter descriptivo. Se utilizó el archivo de la Encuesta de la Comunidad de Puerto Rico (PUMS) 2012-2016. Se consideraron las siguientes variables: tenencia, agua potable, electricidad, seguro de la propiedad, equipamiento, entre otras. Resultados: El PUMS estimó un total de 1,571,764 residencias habitables, 21.2% estaban vacantes y 24.7% se encontraban rentadas. En el 54.1% vivían sus propietarios. De la totalidad el 96.5% pagaba por los servicios de electricidad y 98.8% contaban con agua corriente. Las viviendas rentadas que son hogares familiares constituyen un 63.4%, en contraste 73.4% de las propias. El 31.1% de los propietarios cuenta con seguros para sus domicilios. El 87.2% de las hipotecas incluye en el pago el seguro de la casa. Conclusiones: La falta de agua, electricidad y los destrozos a las estructuras ocasionados por estas tempestades impone la toma providencias para proteger a los ciudadanos ante diferentes adversidades. Pocas son las propiedades no hipotecas que cuentan con seguros y las exigencias de Federal Emergency Mitigation Act (FEMA) dejan descobijadas muchas edificaciones; sin contar la disponibilidad de servicios esenciales. Correspondería considerar medidas de política pública que ayuden a hacer asequibles seguros para salvaguardar bienes y facilitar el acceso a los servicios indispensables, como pueden ser mediante el uso de micro redes y depósitos para almacenar agua entre otras.

**2046 El perfil de las madres adolescentes en Puerto Rico, 2016**

*Ana G Jara Castro<sup>1</sup>, Orville Disdier<sup>2</sup>*

<sup>1</sup>Escuela Graduada de Salud Pública y Ciencias Biosociales, Departamento de Demografía, Universidad de Puerto Rico, Recinto de Ciencias Médicas, San Juan, PR; <sup>2</sup>Instituto de Estadísticas de Puerto Rico

Trasfondo-Objetivos: Distintos estudios señalan que entre 15% y 20% de los nacimientos en América Latina son de madres menores de 20 años. En Puerto Rico, el 12% (2016) de los nacimientos provinieron de madres entre 15 a 19 años. La tasa de fecundidad de las adolescentes en la Isla ha estado entre las más altas comparado con otras jurisdicciones de Estados Unidos. El objetivo de esta investigación es realizar un perfil de las madres adolescentes en Puerto Rico. Método: Esta es una investigación descriptiva. Se utilizaron los archivos de nacimiento de 2016 del Registro Demográfico y el archivo de la Encuesta de la Comunidad de Puerto Rico (PUMS), 2016. Se hizo un análisis de las características sociodemográficas de las madres adolescentes y se calcularon las tasas específicas de fe-

cundidad (TEF). Resultados: los nacimientos de madres entre 15-19 años han disminuido entre 2006 y 2016 de 18% a 12%. La TEF se redujo de 40.17 a 29.68 (2006-2016). Para el 2016, la edad de los padres de este grupo de nacimientos era distinto al de las madres, la mayor proporción (52%) estaban entre 20-24 años, seguido por el 28% entre 15-19 años, comparado con 14% de 25-29 años y 4% de 30-34 años. Aun con las diferencias de edades en la escolaridad tienen semejanzas como que 41% de las madres completaron escuela superior y 43% de los padres también. El 70% de las madres tuvieron menos de 13 visitas prenatales y 30%, 13 visitas prenatales o más. Conclusión: A pesar que la fecundidad de las madres adolescentes ha disminuido sigue siendo una de las más altas de todas las jurisdicciones (8va posición). Es importante analizar el perfil de las madres adolescentes para poder crear políticas públicas para prevenir los embarazos de este grupo y redirigir los esfuerzos a este grupo de madres. Agradecimiento: Instituto de Estadísticas.

**2091 Análisis del Estado Laborar entre Personas con y sin Discapacidad en Puerto Rico para los años 2008, 2011 y 2014**

*Carmen P Oyola Rivera, BA; Illia Torres Avillán, MS*

Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Introducción: La situación económica por la cual está atravesando el país ha complicado el panorama laboral tanto para las personas sin algún tipo de discapacidad como para las que tiene algún tipo de discapacidad. El impacto siendo mayor entre las personas con algún tipo de discapacidad. Objetivo: El objetivo del estudio fue analizar diversas características laborales y sociodemográficas entre las personas con y sin alguna discapacidad. Métodos: Se utilizó la base de datos del ACS, los estimados de un año en Puerto Rico, para los años 2008, 2011 y 2014. Los cálculos se realizaron en personas de 16 a 64 años. El estudio fue descriptivo. Resultados: Los resultados obtenidos del estudio indican que la mayor parte de las personas con algún tipo de discapacidad no forman parte de la fuerza laboral, y la tasa fue en aumento de 706.64 en el 2008 a 717.78 en el 2014, en comparación con las personas sin alguna discapacidad que en su mayoría forman parte de la fuerza laboral. Las personas sin alguna discapacidad obtuvieron tasas más altas de educación mayor a la escuela superior que las personas con alguna discapacidad. Conclusión: Existen diferencias entre las personas con alguna discapacidad en comparación con las personas sin alguna discapacidad las cuales tienen una mayor participación laboral. Es necesario examinar en un futuro cómo se comportan estas tendencias luego del paso del huracán María que ha cambiado la vida en la isla.

**2123 Riesgo de muerte por cáncer de colon según el tiempo de inicio de la cirugía después del diagnóstico de cáncer en Puerto Rico**

*Tonatiuh Suárez Ramos, MS(c); Marievelisse Soto Salgado, DrPH; Karen J Ortiz Ortiz, DrPH*

<sup>1</sup>Universidad de Puerto Rico Recinto de Río Piedras, San Juan, PR; <sup>2</sup>Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR; <sup>3</sup>Universidad de Puerto Rico Centro Comprehensivo de Cáncer, San Juan, PR

**Trasfondo/Objetivos:** El cáncer colorrectal es la primera causa de muerte por cáncer en Puerto Rico (PR). Estudios previos han reportado inconsistencias en el impacto del retraso del tratamiento luego del diagnóstico de cáncer. Nuestro estudio pretende analizar el riesgo de muerte según el retraso en la primera cirugía en pacientes con cáncer de colon (CC). **Métodos:** Se analizaron los datos de pacientes diagnosticados con CC entre 2009-2012, reportados al Registro Central de Cáncer de PR. El retraso se definió como el tiempo que transcurre entre el diagnóstico de CC y la primera cirugía (< 16 días, 16-30 días y ≥ 31 días). Las variables de control fueron: edad, sexo, estadio del cáncer, grado del tumor, estado marital, plan médico y el Índice de Comorbilidad de Charlson. Se utilizó el método de Kaplan-Meier y el modelo de Cox para evaluar los riesgos de muerte según el tiempo de retraso. **Resultados:** Se incluyeron 1354 pacientes de los cuales 51.9% fueron masculinos; la edad promedio fue 67 años (±12.6). El riesgo de muerte en personas que tuvieron un retraso en la cirugía ≥ 31 días fue 47% (HR: 0.53, IC 95%: 0.39-0.70) menor que el riesgo de muerte en personas con un retraso < 16 días, cuando ajustamos por variables de control. **Conclusión:** Se observó un riesgo de muerte mayor en pacientes con poco retraso entre el diagnóstico de CC y la primera cirugía. Aunque este resultado va en contra de la hipótesis formulada, los resultados son consistentes con estudios previos. Estudios futuros deben considerar el tipo de cirugía (electiva vs. emergencia) y diferentes factores de riesgo de CC al evaluar la relación entre riesgo de muerte y retraso en el tratamiento. **Agradecimientos:** Este trabajo fue apoyado por el NPCR #5U58-DP 003863-05, NIH-NCI SUGICA189862-04 y NIH-NCI #CA096297/CA096300. Este proyecto fue aprobado por el IRB.

**2129 Access to substance abuse treatments: Whites and Hispanics**

*Darlene I Santiago<sup>1</sup>, Doug Landistte<sup>2</sup>, Cheng Li<sup>2</sup>*

<sup>1</sup>School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Pittsburgh Medical Sciences Campus, Pennsylvania, USA

**Public Policy Under Analysis:** This study presents and analyzes the most recently available dataset (2015) of the National Survey on Drug Use and Health (NSDUH) to further evaluate more recent trends in the on-going disparity between Hispanics and Whites access to substance use treatments. **Theoretical Framework:** The conceptual model proposed by King and Williams (1995) links social, economic and behavioral factors

to associate race and health outcomes. **Sources of Information:** This study characterizes results and associations from the Substance Treatment module of the Substance Abuse and Mental Health Services Administration (SAMHSA) NSDUH 2015 annual census data. **Research Methods:** Categorical variables were summarized using frequencies and percentages. Chi-squared test was used to test associations between ethnicity (Hispanic versus not Hispanic) and other categorical variables. **Findings:** Hispanics and Whites reported at different frequencies receiving treatment in the past ( $p = 0.005$ ), Whites receiving more frequently treatment than Hispanics. During 2015 Hispanics reported more frequently the need for treatment and for additional treatment than Whites ( $p = 0.206$  and  $0.261$ ). Hispanics also reported more frequently making efforts to receive the needed treatment compared to Whites ( $p = 0.289$ ). Both ethnic groups coincide in the three most frequent reasons for not receiving the treatment they needed. No health insurance was the most frequent reason why Hispanics did not receive the treatment they needed ( $p = 0.037$ ), whereas whites reported not ready to stop ( $p = 0.960$ ). Hispanics reported more frequently the statement “there were no openings” as the main reason for not receiving the additional treatment ( $p = 0.017$ ). **Implications for Public Policy:** Hispanics still at 2015 show differences in substance abuse treatments compared to Whites in terms of access to treatment and need for treatment. **Acknowledgements:** This project was partially supported by The National Institute of Health Award Numbers: HCTRECD R25MD007607 and HiREC S21MD001830.

**2138 Accuracy of the Short Blessed Test and the Clinical Dementia Rating Scale – Memory Domain as screening tools for Early Onset Alzheimer’s Disease**

*Alexandra Rivera Santos<sup>1</sup>; Jorge Acevedo Canabal, MD<sup>1</sup>; Ginette González Ramírez<sup>2</sup>; Mariela M Rivera Agosto, MD<sup>1</sup>; Nathalie Rivera<sup>1</sup>; María Rodríguez<sup>1</sup>; Arturo Pérez<sup>2</sup>; José Nieves<sup>1</sup>; Aleyda Maldonado, PhD<sup>1</sup>; Ivonne Z Jiménez Velázquez, MD<sup>3</sup>*

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Puerto Rico Río Piedras Campus, PR; <sup>3</sup>Department of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR;

**Objective:** Early Onset Alzheimer’s Disease (EOAD) is a rare cause of Alzheimer’s Disease (AD) associated to inheritable genetic mutations that occur in an autosomal dominant pattern. EOAD is distinguished from AD by having an age of onset < 65 years. Members of families with history of EOAD may have up to 50% risk of developing AD and could benefit from screening tests that identify early symptoms. This study aims to describe the accuracy of the Short Blessed Test (SBT) and the Clinical Dementia Rating-Memory Domain (CDR-M) in identifying cognitive impairment suggestive of dementia in members of

families with EOAD in Puerto Rico. Methods: A sample of 206 participants <65 years of age with family history of EOAD SBT and CDR-M were performed. Positive results suggestive of early onset dementia were defined as a score  $\geq 10$  for the SBT, and a score  $\geq 1$  for the CDR-M. All tests were scored by study physician and neuropsychologist. Results were correlated to previous EOAD diagnosis, and data was analyzed to determine the Positive Predictive Value (PPV), Negative Predictive Value (NPV), Sensitivity, and Specificity of both screening tools. Results: Out of 206 participants, 15% (n=31) had been previously diagnosed with EOAD. Sensitivity ranged from 48.4% (CDR-M) to 58.1% (SBT). PPV for both tests were < 43%. Specificity ranged between 77.1% (SBT), and 88.6% (CDR-M), and both tests had a NPV > 90%. Conclusion: In our study, the SBT and CDR-M screening tests were found to have limited sensitivity and positive predictive value for assessing cognitive impairment. However, a strong negative predictive value was present in our population. Accurate screening tests for early diagnosis in our population are still needed.

**2147 Professional Volunteer Teams Help Communities After the Hurricane María**

*Yari Valle Moro<sup>1</sup>, Iván Delgado López<sup>2</sup>, Gipsie Rodríguez<sup>3</sup>, Lisbeth Rodríguez<sup>3</sup>, Leslynette Ramos Iriarry, María Victoria García Cingolani, Ralph Reyes Ventura<sup>4</sup>, Maribel Campos Rivera<sup>2</sup>*

<sup>1</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, San Juan, PR; <sup>2</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>San Juan Bautista School of Medicine, Caguas, PR; <sup>4</sup>National University College

**Background & Objectives:** Loss of essential services post hurricane Maria affected the health services infrastructure hindering the capacity to provide care for both acute and emerging health conditions as well as continuity of care of established chronic diseases. Healthcare professionals from different backgrounds met to establish multidisciplinary groups and set out to offer medical assistance to help the communities affected by the hurricane in response to a call to action disseminated through professional organizations on the behalf of the Puerto Rico Department of Health. Beyond the impact on resource availability and established infrastructure on the routine delivery of services, a more humane approach is required considering the impact of the event on social determinants of health. The objectives of this project are: 1) Document the experience of a team of providers who participated of this volunteer effort. Methods: Every day, a group of healthcare professionals from different disciplines reached out to communities affected in different municipalities. Upon completion of each visit the team performed a debriefing procedure. Results: Time investments to establish and sustain a deployment process and steady supply of resources are needed to provide timely response. In this

emotionally intense scenario, we heal not only through medicine but we also heal through the psychological, social and emotional aspects. A sense of abandonment was a recurrent complaint and the steadiest resource was community based.

**Conclusions:** The accounts of providers and receivers of the services channeled through this effort should encourage partnerships between the private and public sector and the willingness from both sectors to assist with funding for training, and logistical support for healthcare professionals on how to prepare and respond to other disasters events. Acknowledgements: This was achieved thanks to the efforts of Professional Colleges and Associations, volunteer groups, students, and information from the Department of Health.

**2156 Pobreza entre los ancianos: características sociodemográficas y económicas de la población de 65 años o más en Puerto Rico, 2012 -2016**

*Luis A Rodríguez Ortiz, Chrystal M Galán Rivera, Luz E León López*

Centro de Investigaciones Demográficas, Programa de Demografía, Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

**Introducción y objetivos:** Puerto Rico se enfrenta a una crisis económica sin precedente. Estudios señalan una relación directa entre el nivel económico y la salud. La población de 65 años o más se encuentra más vulnerable ante la crisis dado a que gran parte ya no participa de la fuerza laboral, depende de sus pensiones o del seguro social y muchos tienen algún tipo de discapacidad. El objetivo principal fue estudiar las características sociodemográficas y económicas de las personas de 65 años o más que residen en la isla. Métodos: Se realizó una investigación transversal descriptiva utilizando los datos de la Muestra de Micro Datos de Uso Público de la Encuesta de la Comunidad para Puerto Rico, 2012-2016. La población estudiada fueron las personas de 65 años o más que residían en Puerto Rico para el periodo de 2012-2016. Resultados: El 17.4% de la población total de Puerto Rico era mayor de 65 años. El 56.5% de la población de 65 años o más eran mujeres y 43.5% eran hombres. El 39.9% de esta población estaba bajo el nivel de pobreza, la mediana de ingreso por individuo es menor para las mujeres (\$7,993) que para los hombres (\$11,457.25) y que el 66.6% dependen solo del seguro social. También se observa que a menor educación, menor ingreso y que a mayor edad, menor el ingreso. Comparando los hogares, los que se componen de parejas casadas tienen mayor ingreso y los hogares compuestos por hombres que viven solo tienen el menor ingreso. Conclusión: Hay características sociodemográficas que puede afectar la situación económica de los ancianos. Un poder adquisitivo menor significa menos dinero para medicamentos y menos dinero para lograr una mayor calidad de vida. Esto amerita atención y políticas públicas que minimicen el impacto de la crisis en las poblaciones vulnerables.

**2181 Asthma and COPD Overlap Syndrome in Puerto Rico: A Descriptive Study**

*Darilys M Cuevas Acevedo, PharmD; Jonathan Rojas Muñoz, PharmD; Zaidimar Vargas Villarubia, PharmD; Kyle Melin, PharmD, BCPS, AE-C; José J Hernández Muñoz, RPh, MPH, MS, PhD*

School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** The Asthma-COPD Overlap Syndrome (ACOS) is characterized by persistent airflow limitation that presents several features usually associated with asthma and COPD. In 2015, the GINA and GOLD associations published a consensus statement in which they presented the first approach for management of this syndrome. The primary goal of this investigation is to estimate the prevalence of ACOS in the ASES beneficiaries of the Puerto Rican population. **Methods:** This investigation will follow a retrospective cross-sectional design. The first stage of the project will consist of the identification of the ACOS population from the ASES database using ICD-9 codes for asthma and ICD-9 codes for COPD. For the purposes of this study, ACOS will be defined as an individual with one ICD-9 code for asthma and one for COPD through the three-year period. This step will also be performed in the years individually to observe possible variabilities in the estimated prevalence. **Results:** The results of the absolute prevalence of ACOS in the studied population is 28 individuals per 1,000. This type of prevalence was also established for asthma and COPD and the results were 126 and 44 per 1,000, respectively. The results are consistent with values reported in previous literature. **Conclusion:** ACOS is a prevalent syndrome in the ASES beneficiaries with shares characteristics like COPD. It is more common in females than males and at the age of approximately 66 years old. **Acknowledgements:** Nothing.

**2188 Procesos de resiliencia y recuperación post huracán María en la comunidad Socucho en Morovis y su vinculación con la actividad académica durante el proceso de recuperación comunitaria y reconstrucción del país**

*María T Borges Cancel, Marcilyn Colón Colón, Claudia E Colón Burgos, Gladys J Estrella Ayala, Alexis L Laboy Almodovar, Melany L Lopez Maldonado, Wandimar Matos Rosario, Marysel Pagán Santana, Yazahira Pérez Rodriguez, Naresly Reyes Medina, Lenulisy Rosado, Jesica Vicente Reyes, Dayanara Martínez Rosado, Kimberly Cartagena Rivera*

Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

**Antecedentes y Objetivo:** El 20 de septiembre de 2017 Puerto Rico fue afectado por el Huracán María. Este sistema atmosférico categoría 5 devastó al municipio de Morovis. El sistema

eléctrico de la Isla y del municipio de Morovis quedó destruido y el sistema de agua potable fue afectado severamente. La ausencia de agua potable y la falta de energía eléctrica provocaron que muchas personas de la comunidad Socucho en Morovis recurrieran a otros mecanismos poco recomendados para el lavado de ropa y de utensilios del hogar. Estas nuevas prácticas adoptadas generaron condiciones de vida insalubres en esta población. El objetivo de los estudiantes y la facultad del curso EDSA 6045 Participación Social y Apoderamiento Comunitario fue promover el manejo adecuado del agua y prácticas de higiene en un grupo de estudiantes de la escuela elemental de dicha comunidad. **Método:** Se ofrecieron unas actividades educativas sobre el sobre el manejo adecuado del agua y el uso de un filtro de agua donado por el proyecto PROTECT y se colocó una mesa con material informativo adaptado para niños en el vestíbulo de la escuela. Se realizaron entrevistas con el personal escolar y se efectuó una visita ocular por la comunidad. **Resultados:** 310 personas fueron impactadas durante las actividades. En específico, 290 estudiantes, 15 personas que forman parte del personal de la escuela y 5 personas de la mencionada comunidad. Esto contribuyó al uso adecuado del filtro de agua. Los esfuerzos de la comunidad escolar a favor de la salud fueron evidentes en las entrevistas. **Conclusión:** Vincular la actividad académica al análisis salubrista del impacto y recuperación comunitaria facilitó que los estudiantes consolidaran su experiencia de aprendizaje y reforzaran su compromiso con la reconstrucción del país. **Agradecimientos:** Proyecto PROTECT.

**2189 Evaluation and Analysis of a Noise Reduction Enclosure: The impact of absorbing materials, surface area, and design**

*Sergio A Caporali, PhD<sup>1</sup>; Ernack E Guzmán, BS<sup>2</sup>*

<sup>1</sup>Profesor y Coordinador del Programa Graduado de Higiene Industrial, Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR; <sup>2</sup>Estudiante Graduado en el Programa de Higiene Industrial, Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Given hurricane Maria's catastrophic impact over Puerto Rico on September 20, 2017 it caused general power blackout in the island. That lasted for many months, this situation led Puerto Ricans to find the way to get electric power in their houses, generally by the use of portable power generators. It is broadly recognized that this type of equipment represents a significant source of noise, both occupationally and environmentally. For this reason, many people started to look for alternatives to control the noise, many of them without any knowledge about the physics of sound and how to control it. Using the theory contained in the course of "Control of Physical Hazards", this is a requirement of the Industrial Hygiene

Graduate Program, Dr. Sergio A. Caporali assisted by second year graduate students from Industrial Hygiene Program designed and built an acoustic enclosure for a small, 2,100 Watts inverter type power generator. The main purpose of this project was to evaluate the enclosure ability to reduce noise in the octave band frequencies of 125, 250, 500, 1000, 2000, and 4000 Hz. Results suggests that the enclosure was in fact very effective in reducing noise, especially from sources of high frequency. Throw the development of this work many doors where open to evaluate and analyze some interesting concepts contained in the course material like the materials absorption coefficients, the impact of reverberant fields, transmission loss, and natural frequency.

**2207 Epidemiología de Desastres: Puerto Rico después del Huracán María**

*Agosto Rosa H, Estrada Merly N, González W, Hernández Fradera L, Ramos Cartagena J, Rivera Cátala C, Rodríguez Reyes LE, Zayas Martínez LM, Reyes Pulliza JC*

Departamento de Bioestadística y Epidemiología, Escuela Graduada de Salud Pública y Facultad de Ciencias Biosociales, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Trasfondo/Objetivos: En el año 2017, Puerto Rico experimentó el peor desastre natural en su historia. El Huracán María causó daños en infraestructura, potenció secuelas negativas en estadios de salud, y colapsó los servicios esenciales del país. Desde la perspectiva de epidemiología de desastres, se condujo una investigación para evaluar las consecuencias del paso del Huracán, los elementos de sistemas de vigilancia durante desastres naturales, y la respuesta de las autoridades en Puerto Rico. Metodología: Se realizó una revisión de las guías y protocolos contenidos en la literatura científica y de noticias locales desde septiembre a noviembre de 2017. Resultados: Se evidenció el colapso de: acueductos y alcantarillados, electricidad, telecomunicaciones, servicios de salud, sistemas de vigilancia y manejo de emergencias. No se contabilizó correctamente los casos de influenza, sarna, conjuntivitis, gastroenteritis, leptospirosis, piojos, rabia, y enfermedades arbovirales. El número de muertes relacionadas al huracán no se ha reportado con certeza, desatando controversias sobre el verdadero número de muertes. Se evidenció pobre manejo de la salud mental, aumentando los casos de suicidio reportados. Conclusión: La población de Puerto Rico se encuentra en un estado de indefensión y vulnerabilidad. La evidencia denuncia pobre manejo de la emergencia y los resultados indican una falta de un plan para el manejo de la emergencia antes, durante y después del paso del huracán. No se siguieron los pasos determinados por las agencias pertinentes ante el manejo de un desastre natural. Se recomienda emplear, evaluar, y simular planes de emergencias periódicamente en el sector público y privado.

**2213 La vulnerabilidad ante el desastre: características sociodemográficas de la población ubicada en la ruta del huracán María**

*Chrystal Galán Rivera, Luis A Rodríguez Ortiz, Leidymee Medina de Jesús, Alfonso Mercedes Guevarez, Rady Lugo Estrada, Luz E León López*

Introducción y objetivos: Las características demográficas de una población afectada por un desastre natural pueden aumentar el potencial de riesgo que esta experimentará ante el evento, particularmente cuando este tipo de evento afecta a grupos menos privilegiados. El objetivo del estudio fue analizar las características sociodemográficas de la población directamente afectada por la ruta del huracán María ocurrido en Puerto Rico el 20 de septiembre de 2017. Métodos: El estudio fue transversal descriptivo. La fuente de información fue el Puerto Rico Community Survey, 2012-2016. Se construyó una región que combinó los municipios tocados por la trayectoria directa del fenómeno y aquellos cerca de la misma. Se calcularon indicadores sociodemográficos relacionados con la vulnerabilidad de la población. Resultados: La trayectoria afectó 32 municipios (41%), con 1,167,103 habitantes. La población de la región tiene una estructura de edad vieja (mediana de edad de 38 años). Más de la mitad son mujeres (52%); 14% de los hogares están dirigidos por féminas con hijos menores de 18 años. Existe un alto por ciento de hogares con personas de 60+ (44%), considerable proporción de personas con discapacidad (23%), bajos niveles de ingreso (mediana \$16,272), y un 53% bajo el nivel de pobreza. Una alta proporción solo había completado escuela superior o menos (61%). Cerca de la mitad recibe beneficios del programa de asistencia nutricional (47%) y 53% tiene seguro médico público. Conclusión: La población residente en los municipios en o cerca de la trayectoria presentó características sociodemográficas que aumentan los riesgos y la vulnerabilidad ante el fenómeno. Su interacción tiene la capacidad de aumentar el riesgo de daños antes, durante y luego del evento. Las mismas en conjunto con otras variables como la ubicación geográfica, infraestructura, tipo y condición de vivienda pueden limitar la habilidad de sus miembros para protegerse y reponerse del daño ocasionado.

**2214 La población extranjera en Puerto Rico: diferencias en sus características sociodemográficas de acuerdo al país de nacimiento, 2012-2016**

*Leidymee Medina De Jesús, BA; Luz E León López, PhD*  
Centro de Investigaciones Demográficas, Programa de Demografía, Escuela Graduada de Salud Pública, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Trasfondo y objetivos: Puerto Rico se caracteriza por ser un país emisor de migrantes. La población extranjera que reside en Puerto Rico se encuentra expuesta a situaciones de vulnerabilidad debido a las condiciones que enfrentan en el país de

destino. La población extranjera que reside en la isla proviene de diferentes países, por lo tanto, podrían reflejar diferentes necesidades y circunstancias. El objetivo de la investigación fue analizar y comparar las características sociodemográficas de la población extranjera residiendo en la isla por grupos étnicos. Métodos: La fuente de información fue el Puerto Rico Community Survey, 2012-2016. El estudio fue transversal descriptivo. Resultados: El 8% de la población nació fuera de PR. La población extranjera se compone de personas que nacieron en: Estados Unidos (62%), República Dominicana (22%), Cuba (5%) y otros países (12%). Las mujeres predominaron en todos los grupos étnicos. Dentro de la población extranjera se distinguieron las personas cubanas con una estructura de edad más vieja, mayor mediana de ingresos, mayor mediana en el valor de vivienda, un nivel más alto de educación y en estar casados. El grupo étnico que resultó estar en condiciones más precarias fue la población dominicana con un bajo nivel de educación (38.6% con menos de 4to año escuela superior), mayor por ciento en estado de pobreza (49.8%) y un alto porcentaje residiendo en viviendas alquiladas (48.5%). Conclusión: La población extranjera que reside en PR muestra características que se diferencian por grupos étnicos. Examinar las características sociodemográficas de los diferentes grupos étnicos es fundamental porque brindan un acercamiento a sus condiciones de vida y situaciones de vulnerabilidad, lo que podría traer consecuencias a la salud. Proteger la salud de la población extranjera, requerirá de una planificación de servicios y políticas públicas dirigidas a identificar sus necesidades y manejo de servicios de salud.

**1671 Psycho-Social Survey: Comparison of Permanent Pacemaker Impact through 15-year Interval**

*Vivian V Altiery De Jesús, BS, MDC<sup>1</sup>; Vivian A Altiery De Jesús, BSc<sup>2</sup>; Julio A Altiery De Jesús, BSc<sup>3</sup>; Robert González Fernández, MD, PhD<sup>1</sup>; Enid J García Rivera MD, MPH<sup>1</sup>*

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Biology BS candidate University of Puerto Rico Río Piedras Campus, PR; <sup>3</sup>Political Science BS candidate University of Puerto Rico Río Piedras Campus, PR

Cardiovascular disease is one of the main health problem in Puerto Rico. Permanent Pacemaker (PPM) are known to be beneficial. However, as most procedures, its therapeutic success depends on the patient's acceptance. A brief interview was made at an Interventional Cardiologist Office located at Centro Cardiovascular de Puerto Rico y del Caribe. Ninety-two patients were chosen based on medical record and then a list was provided with potential subjects, only 67 completed the interview. Patients were classified among six groups based on implantation time (2001-2016). The interview was guided by a short survey composed of three parts: Demographics, Positi-

ve/Negative Aspects, and 16 questions which 14 were adapted from a previous study. Overall results revealed that most patient adapted to PPM in less than a month and had not suffered an overall negative impact. However, pacemakers were the second condition considered as a major life impact, preceded by none. Nonetheless, pacemakers provided better compliance and was perceived as an enhancer of security and health. However, PPM did not promote healthy eating habits nor increased physical activity. Stratified results for cohort showed statistical significance in the involvement of a supportive group and individual independence. The following aspect showed marginal statistical significance: awareness about cardiovascular disease, life extension perception and worthiness. Although, not statistical significant, we found clinical importance in the following: depression, psychiatric help consideration, physical activity, work, economy, and positive impact in security and health. We conclude that some aspect of pacemaker adaptation is dependent of the time span since implantation. This study was supported by the UPR School of Medicine Endowed Health Services Research Center, Awards: 5S21MD000242 and 5S21MD000138. Approved by IRB.

**1675 Aplicación de la Teoría de Acción Razonada a la Intención/Acción de Hacerse la Mamografía en Mujeres No Adherentes Mayores de 40 Años en Puerto Rico**

*Emily Loran Velázquez, Héctor Colón Jordán, Mirza Rivera Lugo, Vivian Colón López*  
University of Puerto Rico Medical Sciences Campus, San Juan, PR

Introducción: En PR el cáncer de mama es el principal tipo de cáncer que afecta la salud de las mujeres. El método de detección temprana recomendado para identificar los tumores en mujeres sin síntomas es la mamografía. La literatura plantea varios elementos que median en las prácticas de mamografía en diferentes escenarios y segmentos poblacionales. Las actitudes, creencias, normas subjetivas e intenciones han mostrado ser influyentes en la toma de decisiones a nivel conductual. Estos elementos no habían sido explorados en torno a las prácticas de mamografía de las mujeres en PR. El objetivo del presente estudio fue examinar la influencia de las actitudes de las mujeres en Puerto Rico hacia la mamografía mediante la aplicación de la Teoría de Acción Razonada (TRA). Métodos: La fuente de información fue la base de datos del Proyecto Cultivando la Salud realizado con una cohorte de 259 mujeres no adherentes a la mamografía, mayores 40 años y residentes de Canóvanas, durante los años 2012 al 2013. El análisis multivariado consistió de una regresión logística para estimar los efectos independientes de los constructos de la TRA ajustando por predictores significativos en la literatura. Resultados: Las variables de normas subjetivas (OR = 4.9; p = .017), plan médico de reforma (OR = 2.5; p = .024), edad (50 a 59: OR = 3.6; p = .011, 60 a

69: OR = 3.5;  $p = .027$ , 70 o más: OR = 6.6;  $p = .007$ ) y divorcio en estado marital (OR= 0.3;  $p = .041$ ) fueron predictores significativos de mamografía. Conclusión: Los resultados del presente estudio aportan a conocer sobre las actitudes y otros elementos que conforman la decisión de realizar la mamografía en mujeres no adherentes. Los hallazgos permiten inferir que vínculos sociales pueden tener un fuerte efecto en la toma de decisiones en torno a la mamografía. Aprobado por el Institutional Review Board (IRB) del Recito de Ciencias Médicas de la Universidad de Puerto Rico el día 16 de noviembre de 2016, protocolo número A8S30216.

**1693 Exploring the Well-being of Resident Physicians at a Hispanic Academic Medical Center, 2015-2016**

Luz N Colón de Martí, MD<sup>1</sup>; Linnette Rodríguez Figueroa, PhD<sup>2</sup>; Alondra M Ayala, MD

<sup>1</sup>Department of Psychiatry, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Biostatistics and Epidemiology, Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Columbia Associates in Psychiatry, Arlington, Virginia

Background: During their training, residents are exposed to stressors which often include but are not limited to sleep deprivation, financial debt, and a large work load. These stressors can impact residents' well-being. Physician's well-being is crucial to deliver safe and cost-effective care to patients. Objectives: To explore residents' sleep hours on work days and off-duty days, and if there is an association between sleep hours, having moderate-severe depressive symptoms, and seeking health care services. Methodology: Residents officially enrolled at the UPR School of Medicine Residency Programs were asked to participate. Participation was voluntary and anonymous. IRB approval was obtained. Socio-demographical data, questions related to their wellbeing, and questions about their willingness to seek health care services were collected. Participants completed the Patient Health Questionnaire (PHQ-9) and the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA). Proportions were compared using chi-square tests. Results: A total of 230 subjects (response rate =54.7%) participated, 50.7% were males. Most (75.9%) reported sleeping  $\leq 6$  hours on workdays, 14.8% of which also slept  $\leq 6$  hours on off-duty days. Significantly, more females slept longer hours during both work and off-duty days compared to males. Almost 16% of those who slept  $\leq 6$  hours on work days reported moderate to severe depressive symptoms compared to 7.3% of those who slept 7-8 hours. 55.2% of those with moderate-severe depressive symptoms did not make any appointment with a health care provider. Reasons for not seeking mental health providers included: "Not having time" (60%), "Worry about being absent from work" (43%), and expressing that their "Problems were not that severe" (26.7%). Conclusion: It's necessary

to increase residents' awareness about the relevance of adequate sleep hours and compromise with their overall mental health and wellness.

**1697 Decision Tree Method Application to Identify Proteins Critical to Learning in a Mouse Model of Down Syndrome**

Christian E Cruz Cruz, BSc

Department of Biostatistics and Epidemiology, Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR

In recent decades, chromosomal abnormalities have been a worrying topic in the medical sciences research. Down syndrome (DS) is a genetic condition (trisomy of human chromosome 21) associated with intellectual disability. The overexpression of Hsa21 genes by the extra copy of a normal chromosome results in learning and memory defects in mouse models, suggesting that trisomy of these genes may contribute to learning disability in people with DS. In this research, I have carried out a strategy based on the classification method, Decision Tree (DT), to identify biologically significant differences in protein levels in mice exposed to the context of fear conditioning. I analyzed expression levels of 77 proteins obtained from normal genotype control mice and from their trisomic littermates (Ts65Dn) both with and without treatment with the drug memantine. Control mice learn successfully while the trisomic mice fail, unless they are first treated with the drug, which rescues their learning ability. The application of DT in the dataset reduced a subset of 33 proteins to make the most significant and critical contributions to normal learning, failed learning, and salvaged learning. On the basis of this reduction, a visual representation of the data is provided which allows a better connection of new biological responses to understand the different types of learning and response to memantine. In conclusion, results demonstrate that the DT method to classify is efficient for new experimental data sets related to identify common critical protein responses, and drug treatments to facilitate the rescue of learning impairments.

**1712 Fatty acid-induced inflammasome activation in old-endothelial cells develops pro-atherogenic senescence**

Aidaliz Lloréns Bonilla<sup>1</sup>, Venkateswara R Gogulamudi<sup>2</sup>, Anthony Donato<sup>2</sup>

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Geriatric Research, Education, and Clinical Center, Salt Lake City Veterans Affairs Medical Center, Utah, USA

Atherosclerosis is a major concern in the aged-population diagnosed with cardiovascular diseases. This disease is caused by a disruption of the body's lipid metabolism, which leads to progressive narrowing of arteries<sup>3</sup>. Recently, it has been



shown that endothelial dysfunction is a major trigger of vascular inflammation and therefore, atherosclerotic lesions<sup>1</sup>. In age-related diseases, this vascular inflammation can be caused by: irreversible growth arrest (senescence), activation of inflammasomes<sup>2</sup>, and other pro-inflammatory molecules. In this study, we aimed to compare the effects that fatty acids (palmitic acid, PA) have on young and old endothelial cells using the HUVECs cell line. We hypothesize that in old endothelial cells, fatty acids will induce an acute inflammatory response through the inflammasome pathway leading to augmented senescence and therefore, development of atherosclerotic plaques in old people's vasculature. First, cells were incubated with 100  $\mu$ M of PA, 2 mg/mL of LPS or a combination of both for 72 hours. Then, they were stained with X-Gal staining solution to assess the senescence. Also, MitoSox Red Mitochondrial Superoxide Indicator was used to compare the morphology and amount of reactive oxygen species (ROS) produced by the cells. Although both young and old endothelial cells co-incubated with PA exhibited increase senescence compared to control, the old HUVECs had a higher number of senescent cells. Increase ROS production in old cells suggests a higher activation of the inflammasome pathway, and therefore, higher risk of developing atherosclerotic lesions. In conclusion, this study provides evidence that old endothelial cells display an acute inflammatory response leading to higher senescence and therefore, higher vascular inflammation and higher risk of developing atherosclerotic lesions. Pharmacological induced blocking of the inflammasome pathway could have therapeutic potential in age-related diseases such as atherosclerosis. Acknowledgements: This work was supported by NIH/NIDDK, T35 DK103596. References: 1Chen, Y., Pitzer, A. L., Li, X., Li, P. L., Wang, L., & Zhang, Y. Instigation of endothelial Nlrp3 inflammasome by adipokine visfatin promotes inter-endothelial junction disruption: role of HMGB1. *Journal of cellular and molecular medicine* 2015;19:2715-2727. 2Guo, H., Callaway, J. B., & Ting, J. P. Y. Inflammasomes: mechanism of action, role in disease, and therapeutics. *Nature medicine* 2015;21:677. 3Wen, H., Gris, D., Lei, Y., Jha, S., Zhang, L., Huang, M. T. H., & Ting, J. P. Fatty acid-induced NLRP3-ASC inflammasome activation interferes with insulin signaling. *Nature immunology* 2011;12:408-415.

**1715 Assessing Cancer Driving CCR4 Mutations in Cutaneous T-Cell Lymphomas**

*Axel Delgado Amador<sup>1</sup>, Cheng-Hui Hu<sup>2</sup>, Xiao Ni<sup>2</sup>*

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Dermatology, The University of Texas MD Anderson Cancer Center, Houston, USA

**Background & Objectives:** Cutaneous T-Cell Lymphomas (CTCLs) are lymphoproliferative diseases affecting skin-homing cells, and Mycosis Fungoides (MF) and Sézary Syndrome (SS) are the most common types of CTCL. C-C chemokine

receptor type 4 (CCR4) is a T-cell skin homing receptor, and often upregulated in CTCL cells. Our group recently identified 5 mutations (3 nonsense and 2 frameshift) in CCR4 gene. We hypothesize that CCR4 mutation may affect CCR4 expression on CTCL cells and patients' clinical response to anti-CCR4 treatment. **Methods:** In this study, 23 CTCL patients who were in the anti-CCR4 clinical trial were studied. Nested PCR was performed with cDNA synthesized from tumor cell total RNA of 17 patients, and PCR products were sequenced. **Results:** No nonsense and frameshift mutations were seen. Instead, an unreported silent mutation (SM)(c.C1014T) was found in 13 of 17 patients (76.5%) and 4 of 17 (23.5%) had wild-type (W-T) CCR4. **Conclusions:** The carriers of the SM may be correlated with a worse clinical presentation and a hindered clinical response when compared to the W-T group. However, more patient samples and healthy donors need to be studied to validate this SM and its clinical relevance. **Acknowledgements:** This presentation is supported by the National Cancer Institute through the U54 CA096297/CA096300: UPR/MDACC Partnership for Excellence in Cancer Research Training Program.

**1729 Psychometric Properties of the Patient Health Questionnaire-9: A Multigroup Analysis for Depression Symptoms among Puerto Rican Adolescents**

*Stephanie López Torres, BA; Coralee Pérez Pedrego, PhD; Israel Sánchez Cardona, PhD*

Carlos Albizu University, San Juan Campus, PR

**Background and Objectives:** Depression is a serious public health issue and properly validated instruments are required for its evaluation and assessment especially among at-risk groups. The Patient Health Questionnaire-9 (PHQ-9) is one of the most commonly used instruments and has been validated across diverse populations but is rarely evaluated among youth. Considering that, the following study aims to evaluate the psychometric properties of the PHQ-9 through a secondary data analysis based on a sample of children and adolescents residing in Puerto Rico. **Method:** The sample consisted of 567 children and adolescents. Psychometric properties such as sensitivity and specificity of the instrument were evaluated, as well as the exploration of its factor structure. A multigroup confirmatory factor analysis was also included for the purpose of evaluating the invariance among youth considering gender. **Results:** The PHQ-9 proved to be a better fit when the item that assessed suicidal ideation was removed, making reference to the Patient Health Questionnaire-8 (PHQ-8). The PHQ-8 model proved to be the best fit for the data, improving sensitivity and specificity while also presenting high internal reliability and divergent validity. Findings based on the multigroup factor analysis also suggest that symptoms of depression are similar between youth despite gender. **Conclusion:** The PHQ-8 proves to be a useful instrument for the development of future studies based on di-

verse groups who are at-risk for depression such as adolescents. This is especially pertinent for the improvement of assessment, prevention and treatment of depression which has become a worldwide public health issue. Acknowledgments: This research was supported by the Center for Evaluation and Socio-medical Research which provided secondary data of the service program titled: Traumatic Events during Childhood: Evidence Based Stepped Care Model as an Alternative for Management and Mitigation funded by the Department of Justice's Victims of Crime Act Program (VOCA).

**1754 El Síndrome de Quemazón y su relación con la violencia de los pacientes percibida por el personal de enfermería que trabaja en un hospital psiquiátrico**  
*Jennifer Rivera Pérez, RN, MSNs; Natalia B Romero Ayala, RN, MSNs; Elizabeth Román Rivera, RN, EdD*  
Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Introducción: El personal de enfermería psiquiátrico está cuatro veces más propenso que otras especialidades dentro del campo a enfrentar violencia por parte de los pacientes. Estos sucesos afectan a enfermeros psiquiátricos causándoles el Síndrome de Quemazón. A pesar de que este fenómeno se atribuye a diferentes factores, la violencia por parte de los pacientes contribuye considerablemente. El estudio investiga si existe una relación entre el Síndrome de Quemazón y la violencia de los pacientes percibida por el personal de enfermería que trabaja en un hospital psiquiátrico de Puerto Rico. Metodología: Cuantitativo, correlacional-transversal. El Síndrome de Quemazón fue medido con el: "Maslach Burnout Inventory-Human Services Survey" (MBI-HSS) y violencia percibida con el "Perception of Prevalence of Aggression Scale" (POPAS). La población reclutada consistió en profesionales de enfermería, con grado mínimo de asociado entre las edades de 21 a 65 años, trabajando por contrato permanente o per-diem y con experiencia laboral mínima de 2 años en un hospital psiquiátrico de la región Norte de Puerto Rico. La muestra no aleatoria, por disponibilidad estuvo conformada por 50 enfermeros y enfermeras. Los datos se analizaron mediante estadísticas descriptivas. Resultados: La violencia verbal ha sido percibida por al menos un 96% de los enfermeros y la física por al menos un 70%. A diferencia de los enfermeros, las enfermeras son más propensas a experimentar violencia física por parte de los pacientes. Los aspectos que componen el Síndrome de Quemazón presentan niveles por encima de lo esperado. Los hombres presentaron niveles más altos de agotamiento emocional y despersonalización, mientras que las mujeres presentaron niveles altos en la falta de realización personal. No obstante, los componentes del MBI-HSS presentaron niveles variados de consistencia. Conclusión: Los resultados sugieren que ambos instrumentos poseen validez. Sin embargo, los datos recopilados no presentan suficiente evidencia para demostrar una correlación entre variables.

**1745 Experience of HIV Adolescents Compared with Sickle Cell and Inflammatory Bowel Disease Adolescents Regarding Transition to Adult Care in Puerto Rico**

*Minelys M Alicea Marrero, MD<sup>1</sup>; Mónica Rivera Agosto, MD<sup>1</sup>; Irma Febo, MD<sup>2</sup>*

<sup>1</sup>University Pediatric Hospital, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University Pediatric Hospital, Proyecto Gamma, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Every day the number of children with conditions that were previously associated with poor life expectancy, are surviving into adulthood; these adolescents eventually have to transition to adult care, posing increased responsibility on the adolescent. In this qualitative study, we compare the experience of transition of HIV-positive adolescents with that of adolescents with Sickle Cell Disease (SCD) and Inflammatory Bowel Disease (IBD), in Puerto Rico. Methods: We interviewed 31 patients (11 for HIV, 10 for SCD and 10 for IBD), from the University Pediatric Hospital at Centro Médico; regarding general satisfaction, treatment compliance, stigma concerns, health insurance issues, and new health provider relationships. Analysis was made using descriptive statistics, Chi-Square for categorical data and T-test for continuous data. Results: The HIV group was more satisfied with the transition process than the SCD group (p-value: 0.018); no statistically significant difference was found between the HIV and IBD groups. With regards to preparation prior to transition, general satisfaction with new healthcare provider, and problems with health insurance, no statistically significant difference was found between groups. All participants stated trusting their new healthcare provider, which showed in adequate compliance to treatment. However, common concerns found were: problems with authorization of treatment by health insurances, lack of knowledge by the adult healthcare provider about the disease in the SCD, and expecting their pediatric provider to be present in the first appointments with the adult provider in the IBD group. No stigma issues reported. Conclusion: HIV adolescents are the most satisfied with the transition process. However, due to the common complaints between the groups of SCD and IBD, more progress need to be made regarding the transition process. Standard guidelines should be written as a protocol of transition of care at our institution. Acknowledgements: Proyecto Gamma, UPH-SCD Clinics, UPH-IBD Clinics.

**1756 Norovirus Pathogenesis: Elucidation of Programmed Cell Death-associated Molecular Pathways**

*Carlos A Castrodad Rodríguez<sup>1,2</sup>, Kim Y Green, PhD<sup>1</sup>; Eric A Levenson, PhD<sup>1</sup>*

<sup>1</sup>Caliciviruses Section, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda,

MD; <sup>2</sup>School of Medicine, University of Puerto Rico  
Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Human norovirus, from the Caliciviridae family, is a leading cause of acute gastroenteritis. Infection in immunocompetent individuals usually resolves quickly without major complications. However, norovirus exposure in immunocompromised patients can lead to serious chronic infection. Therefore, it is a priority to continue working towards the understanding of norovirus pathogenesis to further development of therapeutics and vaccines. In order to better understand norovirus pathogenesis, it is imperative to further study the cytopathic effect and programmed cellular death mechanisms induced by viral replication. **Methods:** To gain insight into the cellular response to norovirus infection, we sought to analyze the programmed cell death pathways activated during infection in RAW264.7 and BV2 cells, two cell lines which allow robust murine norovirus (MNV) replication. **Results:** Transcriptional analysis of the host response to MNV infection shows upregulation of genes associated with Pyroptosis and Necroptosis. Both of these processes ultimately lead to pore formation in the plasma membrane and cellular death with a role in the clearance of pathogens and stimulation of immune responses. We detected increased cellular permeability of MNV infected RAW264.7 and BV2 cells which is characteristic of both processes. Pyroptosis is mediated in part by inflammatory caspases and the cleavage of Gasdermin D, however, we did not detect this in either cell line. We did detect the localization of mixed lineage kinase domain like pseudokinase (MLKL) to the plasma membrane by immunofluorescence, a hallmark of necroptosis. **Conclusion:** The increased cell permeability, upregulation of genes associated with necroptosis, and the localization of MLKL suggest necroptosis is utilized by the host during MNV infection. **Acknowledgements:** This research was supported by the Intramural Research Program of the National Institute of Allergy and Infectious Diseases (NIAID) of the National Institutes of Health (NIH).

**1780 Endoplasmic Reticulum (ER) Stress is Anti-angiogenic and Anti-tumorigenic**

*Andrea Rivera Ruiz<sup>1</sup>; Jesus E Serrano Negrón<sup>1</sup>; Dipak K Banerjee<sup>1</sup>, Krishna Baksi<sup>2</sup>*

<sup>1</sup>Department of Biochemistry, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Anatomy and Cell Biology, School of Medicine, Universidad Central del Caribe, Bayamon, PR

**Background & Objectives:** Influencing cellular microenvironment could disturb ER function. The result is ER stress activated unfolded protein response (upr) signaling and cell death. Our laboratory has recently shown tunicamycin an asparagine-linked protein glycosylation inhibitor induces ER stress and inhibits angiogenesis in ER-/PR-/Her2+

and ER-/PR-/Her2- breast tumors in balb/c(nu/nu) athymic nude mice. The objective is to address if tunicamycin could also induce ER stress in breast cancer cells. **Methods:** We have used human breast cancer cells as models and tunicamycin as a tool here. The cells were grown in EMEM containing 10% fetal bovine serum, treated with tunicamycin (0.0 - 10.0 µg/ml) in EMEM containing 2% FBS for 7 days, and counted every 24h. To detect surface expression of N-glycan or GRP78 by immunofluorescence microscopy, cells were incubated with FITC-Concanavalin A or Texas Red-Wheat germ agglutinin or anti-GRP78 antibody. The protein expression was quantified by SDS-PAGE followed by Western Blotting. **Results:** Images of tunicamycin treated MDA-MB-231(ER-/PR-/Her2-) and MCF-7 (ER+) cells exhibited inhibition of surface expression of N-glycan. Dose response curve indicated a time dependent inhibition of cell proliferation. However, the immunofluorescence microscopy as well as the western blotting detected increased expression of GRP78 in the ER and supported ER stress in breast cancer cells. Increased expression of IRE-1, ATF4/ATF6 and PERK confirmed upr signaling processed the response. **Conclusion:** Tunicamycin is an antibiotic and a cytokine mimic. Its intracellular target is N-acetylglucosaminyl 1-phosphate (GlcNAc-1P) transferase in the ER. In treated cells, the asparagine-linked proteins are not glycosylated and unfolded/misfolded proteins accumulate in the ER lumen. The result is apoptotic cell death. Therefore, tunicamycin's unique effect on microvasculature and in tumor cells support its developing as a glycotherapy for breast cancer. **Acknowledgement:** We acknowledge the support from NIADDK-NIH STEP-UP Summer Internship Program (AR), NSF grant EPS-1002410 (DKB) and the NIH/NIMHD G12MD007583 grant (KB).

**1805 Synergistic effects of Dantrolene and Nimodipine on the Phenylephrine-induced Contraction and ACh-induced Relaxation in Aortic Rings from Diabetic Rats**

*Roman M<sup>1</sup>, Ramirez J<sup>2</sup>, Torres R<sup>1</sup>, Morales M<sup>2</sup>, Torres H<sup>2</sup>, Crespo MJ<sup>1,2</sup>*

<sup>1</sup>Departments of Physiology, <sup>2</sup>Anesthesiology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Diabetics have a higher risk of developing cerebral vasospasms (CVSP) than non-diabetics. The addition of the ryanodine receptor (RyR) blocker dantrolene to standard therapies reduces vasospasms in non-diabetics. Whether diabetics with CVSP also benefit from this drug, however, is unknown. We evaluated the effects of a 30-min incubation with dantrolene (50 µM), nimodipine (50 nM), and both drugs in combination, on phenylephrine (PHE)-induced contraction, and on acetylcholine (ACh)-induced relaxation in aortic rings from streptozotocin (STZ) diabetic rats. Age-matched, non-diabetic rats served as controls. The oxidative-stress markers malondialdehyde

(MDA) and 4-hydroxyalkenal (4-HAE) were also evaluated in the presence and absence of dantrolene and nimodipine. The combination of these two drugs acted synergistically to reduce the PHE-induced contraction by 80% in both diabetics and controls. In contrast, it increased the Emax value for ACh-induced relaxation (from  $56.46 \pm 5.14\%$  to  $96.21 \pm 7.50\%$ ;  $n=6$ ,  $P < 0.05$ ), and it decreased MDA +4-HAE values in diabetic rats only. These results suggest that the combination of dantrolene and nimodipine benefits both diabetics and non-diabetics by decreasing arterial tone synergistically. Supported by NIH (MBRS-RISE Grant R25GM061838), and NIMHD-RCMI (Grant G12-MD007600).

#### **1807 The Use of Metabolomics in the Study of Mild Hypospadias**

*Coriness Pineyro Ruiz<sup>1</sup>, Nataliya E Chorna<sup>2</sup>, Marcos R Perez Brayfield<sup>3</sup>, Juan C Jorge<sup>1</sup>*

<sup>1</sup>Department of Anatomy & Neurobiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Biochemistry, PR-INBRE Metabolomics Research Center, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Division of Urology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Development of the male urethra is accomplished by many scaffolding processes from genes to metabolites during development. Hypospadias, the atypical anatomical positioning of the urethral opening, reminds us that urethral tube formation in males involves the dynamic interaction of cells/tissues. Metabolomics may offer important insights into metabolic pathways that are altered in hypospadias. A pilot study was conducted to determine whether metabolomics analyses align with previously identified genes associated with hypospadias. **Methods:** We obtained preputial samples from boys with mild hypospadias and control (circumcised) boys ( $n=6$ /each). Identification and quantification of metabolites was performed by gas chromatography/mass spectrometry (GC-MS). Bioinformatics analysis was performed using MetaboAnalyst 4.0. Multivariate analysis was performed by principal component analysis (PCA) to analyze variance between samples and partial least squares-discriminant analysis (PLS-DA) to identify separation between groups. **Results:** PCA total explained variance equals 91.3%. Total variance was mainly explained by PC1 with 86.0 % whereas PC2 contributed 5.3%. PLS-DA total explained variance equals 89.4.3% between mild hypospadias and control boys. PC1 carried an 85.6 % of the total variance whereas PC2 contributed 3.8%. For both PCA and PLS-DA, positive contribution of variance was made by pyroglutamic acid. Negative contribution was made by citrate, 3-hydroxybutyric acid, methylmalonate, and urea. Our results show a significant separation between mild hypospadias and control boys mainly explained by pyroglutamic acid. Pyroglutamic acid

is an intermediate in the glutathione metabolism. Glutathione is critical during development since it is involved in the regulation of cellular proliferation, differentiation and apoptosis. Our working hypothesis is that signaling for urethral tube formation may be truncated by a disturbance in the intracellular redox state. **Conclusion:** Initial metabolomics analyses do not match with previously identified genes in the search of hypospadias etiology. **Acknowledgements:** This research was supported by MBRS-RISE R25 (GM61838) and by NIGMS-INBRE-PR NIH (SP20GM103475-16).

#### **1809 Clinical Profile and Psychiatry Comorbidities of Patients with Obsessive-Compulsive Disorder treated at Center for the Study and Treatment of Fear and Anxiety (CETMA) in Puerto Rico**

*Jahaira Lopez Pastrana, MD; Nestor J Flores Buonomo; Veronica Gutierrez del Arroyo; Alejandra Báez Rivera; Andrea Refojos Liano; John M Sanchez Pares; Karen G Martínez, MD, MSc*

Department of Psychiatry, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Objectives:** Obsessive-compulsive disorder (OCD) is characterized by obsessions, described as recurrent intrusive thoughts, images, or urges that cause distress in an individual and by compulsions described as repetitive mental or behavioral acts, which the person feels driven to fulfill in response to an obsession. Although OCD affects approximately 1% of the population, we do not have research about OCD manifestation in Puerto Rico. **Methods:** This study is a retrospective medical record review of patients diagnosed with OCD treated at the UPR CETMA during the period 2013-2017. The aim of this study to identify the clinical profile and comorbidities in Puerto Ricans patients diagnosed with OCD to better understand the condition, helping the mental health professionals find an accurate treatment plan to help them with the improvement of their quality of life. **Results:** For the period 2013-2017, we treated at CETMA a total of 30 patients diagnosed with OCD. Half of the patient were female and half male with an average age of 33.5 years old. Regarding education and work status 50 % finished a bachelor degree and 54 % are actively working. According to the data, 53% of patients were single, and 63 % has not children. Among psychiatric comorbidities, generalized anxiety disorder identified as the most common comorbidity in OCD patients. The most common obsession found was aggression (88%), and the most common compulsion was checking (88%). **Conclusions:** The OCD observed in equal proportion between females and male, where half of them finished at least a bachelor degree and are actively working. Moreover, we identified the characteristic of OCD symptoms in our population according to the manifestation of obsessions and compulsions. This data demonstrates that GAD is the most common

comorbidity found in our patients. These results provide a profile of OCD in Puerto Rican population that could help us to design an accurate treatment plan including pharmacotherapy and psychotherapeutic modalities to treat our patients appropriately.

**1846 Uso de suplementos herbarios en adultos en el área noreste de Puerto Rico y su potencial de interacción**

*Nelly Conte Schmidt, EdD, BSPH; Odalis Cruz Rivera, PharmD*

Escuela de Farmacia, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

**Trasfondo y Propósito:** La automedicación con suplementos herbarios es preocupante porque los pacientes podrían estar utilizando remedios que los exponen a interacciones droga-herbario. El estudio tuvo el propósito de identificar los herbarios más utilizados, las motivaciones para utilizarlos y determinar el potencial a que ocurran interacciones. **Metodología:** Se realizó un estudio descriptivo mediante encuesta y entrevista a una muestra de adultos de 21 años o mayores (n=150) del área noreste de Puerto Rico. **Resultados:** Un 52.6% (n= 80) de los sujetos han utilizado al menos un suplemento herbario en los pasados 6 meses. De estos, 54 eran mujeres entre las edades 51-60 años. Se identificaron 15 suplementos herbarios los cuales fueron seleccionados de entre un listado de 21 herbarios. Las interacciones más frecuentes involucraban el té verde, la canela y el Aloe vera. Algunas de las razones para su uso fueron: mejorar su salud, son más económicos y porque les gusta. Se identificó un potencial de al menos una interacción droga-herbario en un 71% de los usuarios (n=57). De los medicamentos prescritos identificados el mayor número de interacciones a causa del uso de herbarios fueron metformin (n=19) y simvastatin (n= 15). **Conclusión:** El uso de suplementos herbarios es significativo, sobre todo, entre las mujeres entre las edades 51-60 años. Los usuarios indicaron que los suplementos herbarios ofrecen beneficios como mejorar la salud. Los suplementos herbarios más utilizados presentaron interacción con medicamentos. Se evidenció que el uso de suplementos herbarios trae consigo el potencial de interacción droga-herbario, lo cual supone un posible riesgo para la salud. Los autores recibieron subvención ni tienen algún conflicto de interés.

**1853 Expression of antioxidant genes and drug sensitivity profile of Plasmodium berghei abcg mutant**

*Angélica K de Jesús Sosa, Emilee E Colón Lorenzo, Adelfa E Serrano*

Microbiology Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Malaria is considered the most important parasitic disease in the world due to its morbidity and mortality. Although artemisinin (ART) based treatment

has been successful during years, resistance has been reported to ART and also to other antimalarial drugs. The ART metabolism is associated with an increase in oxidative stress in the parasite by formation of reactive oxygen species. A group of highly conserved membrane transporters, the ATP-Binding Cassette (ABC) has been associated with drug resistance. *Plasmodium* has 16 members of ABC transporters classified in six subfamilies. ABCG is the only member of the G subfamily in *Plasmodium*. In other organisms the ABCG subfamily has been associated with sterol transport, drug resistance, autophagy and glutathione transport. The aim of the study was to assess the contribution of pbabcg to the antioxidant response and to drug sensitivity using the pbabcg mutant parasite (pbabcg<sup>-</sup>). We hypothesized alterations in the expression of antioxidant genes of the glutathione and thioredoxin system, in the pbabcg<sup>-</sup> mutant parasite, which could affect the parasite's drug sensitivity to antimalarials. **Methods:** Expression of *P. berghei* antioxidant genes: gamma-glutamyl synthetase, glutathione-S-transferase, glutathione reductase, glutaredoxin-like proteins, multidrug resistance associated protein, thioredoxin reductase, thioredoxin 1, thioredoxin 2, and plasmoredoxin; was assessed by quantitative real time PCR in pbabcg<sup>-</sup> parasite. Drug sensitivity to chloroquine and ART was determined in the pbabcg<sup>-</sup> parasite. **Results:** The expression of genes in the glutathione and thioredoxin systems was altered in the pbabcg<sup>-</sup> parasites and a displacement in the dose response curve to chloroquine was observed. **Conclusions:** This is the first study that demonstrates an association of the pbabcg gene with the antioxidant systems and a change in susceptibility to antimalarial drugs. **Acknowledgements:** This study was partially supported by grants 8G12MD007600 and U54MD007600 from the NIMHD.

**1871 Novel curcumin analog nanoparticles decreased cell viability, proliferation, and apoptosis in prostate cancer cells**

*Maylein C Juan Rivera<sup>1,2</sup>, Maria M Sánchez Vázquez<sup>2</sup>, Gamalier Maldonado<sup>3</sup>, Geovanny Ruíz<sup>3</sup>, Noralejandra Vázquez<sup>3</sup>, Christian Vélez<sup>4</sup>, Beatriz Zayas<sup>4</sup>, Carlos Cabrera<sup>5</sup>, Magaly Martínez Ferrer<sup>1,2</sup>, David Sanabria Ríos<sup>3</sup>*

<sup>1</sup>Department of Pharmaceutical Sciences, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Puerto Rico Comprehensive Cancer Center, San Juan, PR; <sup>3</sup>Department of Natural Sciences, Inter American University of Puerto Rico, Metropolitan Campus, San Juan, PR; <sup>4</sup>School of Environmental Affairs, Universidad Metropolitana, San Juan, PR; <sup>5</sup>University of Puerto Rico, Río Piedras Campus, San Juan, PR

**Background:** Prostate cancer (PCa) is the most frequently diagnosed cancer and the third cause of cancer-related deaths in American men. Bioavailability of therapeutic agents is impor-

tant for treatment effectiveness. Previous studies demonstrated that development of nanoparticles (NPs) drug delivery vehicles offer an opportunity for targeted drug delivery to tumor cells. Natural compounds including curcumin have shown decreased bioavailability and stability when used as anticancer agent. The purpose of this study is to synthesize the curcumin analog *m*-nitrochalcone (3B) encapsulated into poly (lactic-co-glycolic acid) (PLGA) NPs (3BNP) and determine its anticancer activity against PCa cell lines. Methods: In our approach, 3B were encapsulated into PLGA NPs in the presence of PVA using the single emulsion-solvent evaporation method. 3B loading, encapsulation efficiency, and drug release was determined by spectrophotometric techniques. Physico-chemical properties like zeta potential, particle size, polydispersity index (PDI), and morphology was measured using a combination of Dynamic Light Scattering (DLS) and Scanning Electron Microscopy (SEM). Effects in cell viability, Nf- $\kappa$ B p-65, proliferation, and apoptosis of PC3 and 22RV1 PCa cell lines were investigated when treated with 3B and 3BNP. Results: 3BNP were found to have a particle size of 250nm and smooth spherical shape negatively charged. Moreover, PC3 and 22RV1 cells treated with 3BNP have shown decreased cell viability and proliferation at 48h when compared to control ( $p < 0.05$ ). Additionally, 3B and 3BNP induced apoptosis, but did not affect Nf- $\kappa$ B p-65 when compared to control at 48h. Conclusions: We demonstrated that 3B was successfully encapsulated into PLGA NPs. Our results revealed that 3BNP decreased cell viability and proliferation of PCa cells (PC3, 22RV1) and induced apoptosis when compared to control, suggesting that PLGA improves the delivery of 3B inside the cell. Results from our study will impact broadly the field by developing more effective and less toxic PLGA NPs based therapies.

**1887 Maintaining Neuronal Function: The Role of the Transcription Factor Gooseberry in Synaptic Growth and Stability**

*Marizabeh Pérez, Carihann Dominicci Cotto, Bruno Marie*

Institute of Neurobiology, Anatomy and Neurobiology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background and Objectives: Transcription factors control gene expression to regulate neuroblast fate, neuronal differentiation, axonal guidance and target recognition. Our lab is interested in Gooseberry (Gsb), a transcription factor homologous to the vertebrate *pax3/7*, present in mature motoneurons (MNs) and required for the maintenance of homeostatic compensation at the neuromuscular junction (NMJ). Nonetheless, little else is known about the role of *gsb* in the developed nervous system. Methods: To assess the role of *gsb* in the mature nervous system we manipulated its expression at different stages of MNs development and asked whether the growth and stability of the

NMJ was affected. Results: Perturbing *gsb* expression at both early (pan-neuronal; embryo) and late (after initial synaptic growth; larval stage 2) stages of synapse development affected synaptic growth, suggesting that *gsb* is not only an early fate determinant but can also control synaptic growth at different stages of MNs development. Furthermore, early or late *gsb* overexpression led to cytoskeletal alterations at the NMJ, a hallmark of synaptic instability. We therefore quantified the frequency of synaptic retractions in synapses where *gsb* expression was altered. We found that increasing or decreasing *gsb* expression led to a significant increase in synaptic retraction frequency, suggesting that *gsb* is critical to maintain synaptic integrity. We argue that *gsb* controls mechanisms involved in both synaptic stability and elimination, and that its expression level is critical in directing these processes. We also found that *gsb* and wingless (*wg*) maintain an antagonistic relationship in synaptic growth and stability, and we propose that *gsb* affects a molecule downstream of *wg*. Conclusions: Our data suggest that Gsb, a transcription factor involved in neuroblast differentiation and synaptic homeostasis, controls, in fully developed MNs, an array of synaptic processes essential to the maintenance of neuronal function. Acknowledgements: This research is supported by RISE: 5R25GM061151-16.

**1896 Experiencias de adultos entre 40 y 60 años viviendo con DT2**

*Clara Inés Valderrama F RN, DNS; Nancy Dávila Ortiz, RN, PhD*

Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Antecedentes: La diabetes tipo 2 (DT2) constituye un problema de salud pública. Las grandes fallas en su manejo, están representadas por cifras cada vez más altas de morbilidad, mortalidad y representa altos costos a nivel mundial. Sin embargo se conoce poco sobre cómo es percibida y manejada desde la perspectiva del propio actor. La forma de experimentar la enfermedad es diferente en cada persona y no solo depende de la naturaleza de la enfermedad sino también de las estrategias que utilizan para ajustar su vida a la enfermedad, es un reto que deben enfrentar cada día. Objetivo: describir e interpretar la experiencia de vivir con una enfermedad como la DT2, desde la perspectiva de un grupo de hombres y mujeres entre 40 y 60 años; profundizar en lo que significa para ellos la DT2 y el efecto que ha tenido en su vida. Metodología: Con un acercamiento cualitativo y la fenomenología como método, se entrevistaron a profundidad 10 pacientes diagnosticados con DT2 de un Centro Profesional del oeste de Puerto Rico. Hallazgos: El deterioro lento y progresivo de la salud ante la DT2 es un reto inesperado y catastrófico, les lleva a reajustar su forma y estilo de vida para mantenerse saludables. Estos cambios afectan no solo su vida personal, familiar y social, sino también su estado emocional y psicológico donde el apoyo es fundamen-

tal. Conclusiones: Enfermería debe incluir en el estimado del paciente con DT2 los cambios psicosociales y corporales para ayudarles a afrontar las repercusiones funcionales y los cambios necesarios en sus estilos de vida. Es importante, que enfermería les ayude a redefinir su vida, a integrar en forma positiva la DT2 en su vida diaria, a entender que hay situaciones que no pueden cambiar y que tienen que enfrentar la realidad y aprender a vivir con ella.

**1897 Manifestaciones de traumatización vicaria y del síndrome de quemazón en una muestra de enfermeras que trabajan con mujeres sobrevivientes de violencia doméstica en salas de emergencias de Puerto Rico**

*Wanda Irizarry Justiniano, RN, DNS; María del C Delet Braña, RN, PhD*

Escuela de Enfermería, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Antecedentes: Las enfermeras que trabajan en salas de emergencias están continuamente expuestas a los efectos de los eventos traumáticos que presentan los pacientes que buscan estos servicios, entre ellos, se encuentran mujeres sobrevivientes de violencia doméstica. Esto pone en riesgo la salud física y mental de las enfermeras, que laboran en estas áreas, a presentar manifestaciones de traumatización vicaria o síndrome de quemazón por exposición continua a los relatos de las sobrevivientes. Objetivos: Explorar y describir las manifestaciones de TV y SQ en una muestra de enfermeras que trabajan con mujeres sobrevivientes de VD en salas de emergencias en PR. Metodología: Estudio de investigación con un diseño exploratorio con una muestra de 30 enfermeras que laboraban en 4 salas de emergencias. Se utilizaron dos instrumentos: Escala Modificada de Síntomas de Desorden de Estrés Postraumático y Inventario de Burnout de Maslach y una planilla de datos sociodemográficos. Datos fueron analizados: estadísticas descriptivas, correlación de Pearson y la t de Student, utilizando el programa STATA15. Resultados: Se encontró, que una tercera parte (30%) de las participantes presentaron tanto en las escalas de frecuencia como en severidad, sintomatología de TV. Que existe una relación estadísticamente significativa entre el desarrollo de la sintomatología de TV y el SQ,  $r(30) = .54$ ,  $p = .002$ , y existe diferencia marginal en el SQ entre las participantes con experiencia de VD entre progenitores versus las que no tuvieron experiencia,  $t(28) = -2.03$ ,  $p = .052$ . Conclusión: Aunque los resultados no mostraron diferencias estadísticamente significativas en respuesta a las preguntas de investigación si hay diferencias clínicamente significativas por el efecto en la conciliación vida laboral y personal. La relación entre TV y SQ hace necesario se realicen investigaciones con muestras mayores por la cantidad de víctimas de VD que se mantienen visitando las salas de emergencias en PR.

**1900 BAT-1 Up-Regulation Decreases Cell Invasion and Migration In Vitro**

*García Vargas AM<sup>1,2</sup>, Sanchez Vazquez M<sup>2</sup>, Martínez Ferrer M<sup>2,3</sup>*

<sup>1</sup>Department of Pharmacology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Puerto Rico Comprehensive Cancer Center; <sup>3</sup>Department of Pharmaceutical Sciences, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: In Puerto Rico, prostate cancer is the most common type of cancer and the leading cause of cancer death in men. Approximately one out of seven men will be diagnosed with prostate cancer in his lifetime. The current available biomarkers are unable to predict malignant outcomes such as recurrence. Thus, there is a critical demand for the development of innovative diagnostic and prognostic tools for the management of prostate cancer. Preliminary data from patients who had prostate cancer recurrence identified that HLA-B associated transcript 1 (BAT-1) was down-regulated in patients with prostate cancer recurrence when compared with non-recurrent patients. Methods: We up-regulated BAT-1 in androgen independent PC3 and androgen dependent 22RV1 prostate cancer cell lines using a BAT-1 recombinant protein. *In vitro* assays were performed to measure proliferation, migration and invasion. Results: Proliferation assays using MTS showed no significant change in BAT-1 recombinant protein concentrations ranging from 0.25-2.0µg/mL at 12, 24 and 48hrs for PC3 and 22RV1 cells. Wound healing assay showed that cells treated with BAT-1 recombinant protein at 0.25µg/mL and 2.0µg/mL significantly decreased migration at 6, 12hrs and 24hrs in PC3 cells when compared to control. Boyden assay showed that cells treated with BAT-1 recombinant protein at 0.25µg/mL and 2.0µg/mL significantly decreased invasion in PC3 and 22RV1 cells at 24hrs when compared to control. Conclusions: Our results showed that BAT-1 up-regulation decreased migration and cell motility. Cells did not show a significant change in proliferation. These results were expected due to previous data showing that BAT-1 down-regulation increased cell migration and invasion, suggesting that BAT-1 expression promotes aggressiveness in prostate cancer recurrence. A possible mechanism of action for BAT1 is the modulation of cell migration and invasion. Acknowledgements: This work was supported by the RCMI pilot project (RCMI#8G12MD007600) and the MBRS-RISE Program grant R25GM061838.

**1905 Anti-cancer Activity Of Novel Chalcones Against Highly-Metastatic Prostate Cancer Cells**

*Metsiel Donate<sup>1,2</sup>, Maria Sanchez<sup>2</sup>, Joseph Mooney<sup>3</sup>, Magaly Martinez Ferrer, PhD<sup>1,2</sup>, David Sanabria, PhD<sup>3</sup>*

<sup>1</sup>School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of

Puerto Rico Comprehensive Cancer Center, San Juan, PR; <sup>3</sup>Inter American University of Puerto Rico, San Juan, Puerto Rico

**Background & Objectives:** Prostate cancer (PCa) is the third leading cause of cancer related death in United States. Docetaxel (Dxtl) is one of the current chemotherapeutic drugs that is used for treating PCa in US. Due to its potential toxicity treatment with Dxtl has been relegated to metastatic castration-resistant prostate cancer patients who have progressed after androgen deprivation therapy and presented symptoms arising from the progression of the disease. Thus, there is a critical need to develop new modalities of more effective and less toxic chemotherapies. Recent studies have shown the effectiveness of natural-occurring chalcones (e.g. Curcumin, Curc) as anticancer agents in PCa resistant to Dxtl. It was evidenced that these compounds induced apoptosis and suppress NF- $\kappa$ B activity. The objective of this study is to investigate the effect of C5-Curc and IJMG-205 (synthetic analogs of Curc) in prostate cancer. **Methods:** PC-3 and 22RV1 cell lines were treated with C5-Curc and IJMG-205. Curcumin and Dxtl were used as control. The cytotoxicity effects were analyzed by MTS assays. The NF- $\kappa$ B and proliferation activity were tested by immunofluorescence assay and the apoptosis effects were performed by Western Blot analysis. **Results:** Our studies indicate that Curc-analogs reduce cell viability in PC-3 and 22RV1 in a dose dependent manner after 48h. IC<sub>50</sub>'s values for C5-Curc were 24.8 $\mu$ g/mL and 22.7 $\mu$ g/mL for PC-3 and 22RV1, respectively and for IJMG-205 were 22.9 $\mu$ g/mL and 17.1 $\mu$ g/mL, respectively. There was no significant difference in NF- $\kappa$ B, proliferation and apoptosis activity. **Conclusion:** Cell viability of Curc-derived therapies C5-Curc and IJMG-205 in both cell lines when compared with their control and reduced toxicity. Our findings demonstrate that chalcones may be potential drugs in the treatment of PCa. **Acknowledgments:** Institutional start-up funds from: the University of Puerto Rico Comprehensive Cancer Center and the School of Pharmacy Graduate Program (MMF); and grant P20GM103475 INBRE (DSR).

**1912 Novel Ehop-016 derivatives decrease cell viability, migration/invasion and Rac activity in prostate cancer**

Valerie Velez Rodríguez<sup>1,2</sup>, María M Sánchez Vázquez<sup>2</sup>, Gabriela Fenolla<sup>3</sup>, Eliud Hernández<sup>1</sup>, Cornelis Vlaar<sup>1</sup>, Magaly Martínez Ferrer<sup>1,2</sup>

<sup>1</sup>Department of Pharmaceutical Sciences, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Puerto Rico Comprehensive Cancer Center, San Juan, PR; <sup>3</sup>University of Puerto Rico, Rio Piedras Campus, PR

**Introduction:** Prostate cancer is the first cause of new cancer cases and the third cause of cancer deaths in American men. Therefore, there is a critical need to develop potent inhibitors for

inhibition of metastatic cancer. Rac, a member of the Rho family has been implicated in progression and metastasis of many cancers including prostate adenocarcinoma. Ehop-016, a novel compound, is a previously reported small molecule that inhibits the interaction of Rac with its GEF's with an IC<sub>50</sub>=1.1 $\mu$ M in metastatic breast cancer cells. Ehop016 also inhibits cell mammary fat pad tumor growth, metastasis and angiogenesis *in vivo*. **Methods:** In the current study, we investigated the effects of Ehop-016 derivatives (1-7) in cell viability, migration/invasion and Rac activity of prostate cancer cells. Wound-healing assays (PC3), invasion assays (PC3 and 22Rv1), Rac and Rac-homolog, Cdc-42 activity (PC3 and 22Rv1) were performed following treatment with selected Ehop-016 derivatives. **Results:** *In vitro* studies indicate that Ehop016 derivatives (1,2) reduce cell viability in PC3 and 22Rv1 after 48h when compared to control. IC<sub>50</sub> values for Ehop-016 derivative 1 was 27.95 $\mu$ M and 45.35 $\mu$ M for PC3 and 22RV1 cells respectively. IC<sub>50</sub> values for Ehop-016 derivative 2 was 37.39 $\mu$ M and 25.05 $\mu$ M for PC3 and 22RV1 cells respectively. IC50 values for Ehop-016 derivative 3 was 2.12  $\mu$ M for PC3 cells. Additionally, derivatives 1 and 2 decrease PC3 cell migration/invasion at 12h and 24h when compared to control (p<0.05). Ehop-016 derivative 2 decreases Rac activity at 24h when compared to control (p<0.05). **Conclusion:** Our results indicate that these novel compounds show potential for further development as inhibitors of prostate cancer progression. **Acknowledgements:** This work was supported by Institutional start-up funds to MMF from the University of Puerto Rico Comprehensive Cancer Center and funds from the School of Pharmacy Graduate Program.

**1913 Level of Satisfaction and Perception of Patients that Benefit from a Comprehensive Evaluation of Medications by Pharmacists in the Ambulatory Clinics of the School of Medicine from the University of Puerto Rico**

Ileana Rodríguez Nazario<sup>1</sup>, Mayra L Vega Gerena<sup>1</sup>, Allison Fonseca González<sup>2</sup>, Naiomi González Gorritiz<sup>2</sup>, Cristina M Medina Matos<sup>2</sup>

<sup>1</sup>Faculty of Pharmacy, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Graduated from the Doctor of Pharmacy Program in 2017, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Management Therapy Services (MTS), consists of different services provided by the pharmacist to help the patient solve any drug related problem and optimize their therapy. There is still a lack of information and studies measuring patient satisfaction with MTS. The objectives of this study are: to measure the satisfaction and perception levels, among individuals 21 years of age and older, with the comprehensive evaluation of medications provided by their pharmacists. As well to determine if the overall satisfaction



level is correlated with the perception patients have about the pharmacist's role in their care. Methods: The study followed a descriptive design, including a questionnaire (administered via phone to 57 subjects) with a Likert scale that contained 23 variables. In the inclusion criteria, the subject had to be a person who met the age requirement and received the service during the period of January to December 2016 while being able to answer the questionnaire with or without the help of a caregiver. A descriptive statistic in Excel program was used to obtain the average, standard deviation and frequency for each question of the questionnaire, and a correlation coefficient was calculated in order to measure the possible association between satisfaction and perception levels of subjects. Results: Participants gave positive feedback in the questions measuring satisfaction, with the highest percentage (75.4%) pertaining to the question #16 with a mean of  $4.65 \pm 0.81$ . Regarding the questions measuring perception, the highest percentage (68.4%) belonged to the question #15 with a mean of  $4.65 \pm 0.55$ . The correlation coefficient was 0.6408. Conclusions: There is a positive correlation between the variables of satisfaction and perception. In general, patients were satisfied with comprehensive evaluation of medications offered by pharmacists in the ambulatory clinics. Acknowledgements: Ileana Rodríguez, Mayra Vega, Nicole Quiles, Luis Vilá, María López, Jonathan Hernández and José Hernández.

**1919 Knowledge and Practice of Pertussis Vaccination During Pregnancy by Mothers of Infants Admitted to the Neonatal Intensive Care Unit**

Nicole M Rivera Jiménez<sup>1</sup>, Andrea P Cortes Nazario<sup>1</sup>, Claudia S Rosado Torres<sup>1</sup>, Joann M González MD<sup>2</sup>, Lourdes García Fragoso MD<sup>3</sup>, Zayhara Reyes Bou MD<sup>3</sup>  
<sup>1</sup>University of Puerto Rico, Río Piedras Campus, PR; <sup>2</sup>Department of Pediatrics, San Juan City Hospital, PR; <sup>3</sup>Neonatology section, Department of Pediatrics, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background: Pertussis is a highly contagious upper respiratory infection caused by the bacterium *Bordetella pertussis* that affects individuals of all ages. However, small infants are reported to have more hospitalizations and complications. There are 2 strategies to prevent pertussis in infants: vaccinating pregnant women and caregivers. Objective: To determine knowledge and practice about pertussis vaccine in mothers of newborns admitted to the Neonatal Intensive Care Unit. Methods: Cross sectional study consisting of an anonymous questionnaire given to mothers of newborns admitted to the University Pediatric Hospital NICU from March- December 2017. Approved by IRB. Results: Subjects included 56 mothers ages 19-38 (median 25) who delivered at 24-39 weeks (median 33). Fifty-four percent (54%) have heard about pertussis. Nine percent (9%) were advised by their obstetrician to get the vaccine, only one

mother was not vaccinated. Influenza vaccine was recommended to 26% and one mother did not get it. Ninety one percent (91%) would agree to get a vaccine that can help prevent an infection in their babies. Conclusions: Our study results demonstrated that mothers of newborns had insufficient knowledge about pertussis. Nevertheless, most of the women who were recommended by their obstetricians to get the pertussis vaccine during their pregnancy, got vaccinated. Obstetricians and pediatricians should be proactive in letting women know about the importance of the pertussis vaccine during pregnancy and after delivery to prevent infection in small infants.

**1932 Application of retinoic acid after optic nerve injury affects optic nerve glia and macrophages in adult frog *Rana pipiens***

Valeria de la Rosa<sup>2</sup>, Mildred V Duprey, Jonathan M Blagburn<sup>2</sup>, Rosa E Blanco<sup>1,2</sup>

<sup>1</sup>Department of Anatomy and Neurobiology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Institute of Neurobiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Retinoic acid (RA) is a molecule that plays major roles during development and is present in the adult nervous system. Some RA signaling components are upregulated after injury, we have shown that they are present in the uninjured frog retina at low to moderate levels. After optic nerve injury, there is an increase in the enzyme RALDH and the retinoic acid receptors (RARs) in the frog retina. It is not known whether similar changes take place in the glia of the injured optic nerve. Our objective is to characterize the RA signaling system in the frog optic nerve and to determine the changes that occur after axotomy and application of RA. We performed optic nerve crush and applied into the nerve either saline solution or RA. We examined the optic nerves at 48h, 1 week, and 2 weeks after axotomy with immunocytochemistry and electron microscopy. Our results indicate that RARs are in the optic nerve glia at low levels, and that one week after axotomy there is a significant increase in staining intensity in those glial cells. Electron microscopy studies of the proximal, injury, and distal sites of the optic nerves show macrophages filled with secondary lysosomes and residual bodies. Application of RA to the optic nerve causes a significant increase in the number of macrophages present one week after optic nerve injury. The majority of cells were F4/80-positive in saline- and RA-treated nerves. We also identified a sub-population of anti-inflammatory M2 macrophages (arginase-positive) at the injury and distal sites. We are currently studying the changes in time and location of these populations. In conclusion, axotomy increases RARs in optic nerve cells. The application of RA affects macrophage number and distribution after optic nerve injury and it may play a role in the success of optic nerve regeneration. REB is supported by NIH grant GM116692, JMB by NIH grant NS081726

**1938 Transition Readiness (TR) from Pediatric to Adult-Oriented Care Among Young Adults with Type 1 Diabetes Mellitus (T1DM) in Puerto Rico (PR)**

*Jonathan Vélez<sup>1</sup>, Carlos Leyva<sup>2</sup>, Francisco Nieves<sup>1</sup>, Olga Díaz Miranda<sup>3</sup>, Nilka de Jesús González<sup>1</sup>*

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Centro de Diabetes y Endocrinología, Hospital San Francisco, San Juan, PR; <sup>3</sup>Endowed Health Services Research Center, University of Puerto Rico Medical Sciences Campus, San Juan PR

**Background & Objectives:** This study aims to evaluate if young adults with T1DM in PR are ready to transition from pediatric to adult healthcare settings; and assesses whether socio-demographic, clinical characteristics, and patient's perception about transition are associated with TR. **Methods:** Patients with T1DM aged 16-21 years were consecutively selected from government-sponsored and privately owned endocrinology clinics for six months. Sociodemographic (age, gender, insurance, education) and clinical variables (HgbA1c, number of diabetes-related hospitalizations [DRH], medication regimen) were collected. Perception was appraised by questioning if they considered themselves to be ready for transition, or formally trained and evaluated for such. The validated questionnaire TRAQ5.0(20-items scored from 1 to 5) was administered to patients and caregivers to assess TR (defined as an overall score >4). Mean (standard deviation) and frequencies (percentages) were used to describe the samples, while comparisons were by t-test and Spearman's. **Results:** Sixty-one patients with mean age of 18years were evaluated. Mean TRAQ5.0 for patients was 3.99 (SD=0.55). Thirty-seven (61%) patients perceived themselves as ready for transition. Higher TRAQ5.0 was observed among patients who have had multiple DRH ( $r=0.37$ ,  $p=0.003$ ). Conversely, caregivers rated the patients with lower TRAQ5.0 (3.25 vs. 3.99,  $p<0.05$ ). Lower TRAQ5.0 was also observed among caregivers of patients with elevated HgbA1c ( $r= -0.33$ ,  $p=0.022$ ). Other variables were not associated with neither patient's nor caregiver's TRAQ5.0 scores. **Conclusions:** This sample of young adults with T1DM was not ready to transition to adult care, despite more than half of them perceiving that they were. Caregiver responses validated such findings by rating the patient's overall TR as significantly lower, more so in those with poorer glucose control. Patients with multiple DRH were readier for transition likely due to more frequent inpatient education; or contrariwise, due to less illness-related introspection leading to response bias. Interventions that promote TR in PR are vital to ensure that young adults with T1DM transition to self-empowered adult care.

**1941 Las experiencias de violencia vertical de los estudiantes de enfermería en la práctica clínica**

*Azaria M Candelario, RN, MSNs; Ana N Ortiz, RN, MSNs; Marta Rivero Méndez, RN, DNS*

Escuela de Enfermería, Universidad de Puerto Rico  
Recinto de Ciencias Médicas, San Juan, PR

**Antecedentes:** La violencia vertical es una combinación de comportamientos ofensivos y abusivos entre un personal de poder superior a uno menor. Muy pocas investigaciones han sido dirigidas a la violencia vertical en estudiantes de enfermería, quienes están susceptibles a sentirse humillados, vulnerables, amenazados y ofendidos, creando ansiedad y baja autoestima. Debido a las consecuencias fisiológicas y psicológicas experimentadas en los estudiantes, la calidad en el cuidado del paciente puede disminuir. El propósito de esta investigación fue examinar las experiencias de estudiantes en enfermería sobre la violencia vertical en la práctica clínica. **Metodología:** Estudio cualitativo, fenomenológico descriptivo. Participaron 8 estudiantes (6 mujeres y 2 hombres) de cuarto año entre las edades de 20 a 22 años de una escuela de enfermería en el área metropolitana. Se realizaron entrevistas semi-estructuradas utilizando la técnica de grupos focales. Las entrevistas fueron grabadas en formato de audio y transcritas al verbatim. Los datos fueron sometidos a análisis de contenido. **Hallazgos:** Del análisis de las entrevistas y codificaciones se obtuvieron 5 temas, interpretando la violencia vertical, viviendo la violencia vertical, barreras percibidas, estrategias de afrontamiento y nuevas alternativas. **Conclusiones:** La violencia vertical en la formación clínica y profesional constituye una realidad en la vida de los estudiantes de enfermería. Se hace importante proponer alternativas en los currículos de enfermería sobre el tema de la violencia vertical y preparar a los estudiantes y profesores de cómo afrontar estas experiencias en los escenarios clínicos. **Reconocimiento:** Nuestro agradecimiento a todos/as estudiantes participantes en este estudio.

**1951 Control ejecutivo en medidas de fluidez verbal en una muestra de mujeres puertorriqueñas VIH seropositivas (VIH+)**

*Elisa Ramos Pérez<sup>1,2</sup>, Jan C Barreto<sup>1</sup>, Nadia Centeno Alvarado<sup>1,2</sup>, Valerie Wojna<sup>2</sup>, Rosa J Rodríguez Benítez<sup>1,2</sup>*

<sup>1</sup>Universidad de Puerto Rico, Recinto Río Piedras, PR;

<sup>2</sup>Universidad de Puerto Rico, Recinto de Ciencias Médicas, San Juan, PR

**Introducción y Objetivo:** Luego de la introducción del tratamiento antirretroviral combinado para pacientes VIH seropositivos (VIH+), su expectativa de vida ha aumentado significativamente. Sin embargo, la prevalencia de Trastornos Neurocognitivos Asociados al VIH se ha mantenido a través de los años. El objetivo de este análisis es explorar en tareas de fluidez verbal el control ejecutivo en un grupo de mujeres VIH+. **Método:** En este trabajo se realizó un análisis secundario de datos de un estudio anidado en un cohorte de mujeres VIH+. Se evaluaron 45 mujeres VIH+ estratificadas en cognición normal (CN) y deterioro cognitivo (DC) y 16 mujeres VIH seronegativas, pareadas por edad y educación. El control ejecutivo se eva-

luó a través de las pruebas de fluidez verbal, Newcombe y FAS. Resultados: Para establecer el componente de control ejecutivo en tareas de fluidez verbal, se realizó un análisis de validez concurrente entre las pruebas ( $r=.37$ ,  $p<.05$ ). Se encontró diferencias estadísticamente significativas entre mujeres VIH+ con CN vs. DC en tareas de fluidez verbal ( $p=.015$ ). La adaptación de la prueba Newcombe demostró 71% de sensibilidad, siendo la medida más sensible a detectar dicha diferencia entre mujeres con CN vs. DC ( $p=.013$ ). Conclusión: Los resultados obtenidos podrían sugerir que el DC en el dominio de fluidez verbal se debe a un deterioro en las habilidades de control ejecutivo, más que por un déficit en habilidades verbales en las mujeres VIH+. Agradecimientos: Esta investigación fue parcialmente apoyada por R25MH080661, R21MH095524, S11NS046278, PO31S100037, G12MD007600 y 2U54MD007587.

**1953 Structure of The Seminal Receptacle of Female *Dirofilaria immitis***

Gabriel Borges Vélez<sup>1</sup>, Adriana E Osorio Jiménez<sup>1</sup>, Camillo C Cangani<sup>2</sup>, Nelson Santiago<sup>3</sup>, Wieslaw J Kozek<sup>1,2</sup>

<sup>1</sup>Department of Microbiology and Medical Zoology, <sup>2</sup>Central Electron Microscopy Unit, <sup>3</sup>Department of Pathology, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: *Dirofilaria immitis*, a nematode parasite of dogs, which can produce zoonotic infections in humans, endemic to islands of the Caribbean and countries of Central and South America. As component of our studies on oogenesis of *D. immitis* and Wolbachia-oocyte-rachis relationship, we are studying, by light and electron microscopy, structures of the ovary, oviduct, seminal receptacle and uterus. The seminal receptacle is important component of the reproductive system storing sperm cells in considerable numbers and length of time, ensuring abundance of sperm cells to fertilize oocytes emerging from the oviduct, assuring production of microfilariae. The receptacle in *D. immitis* is different from other filariae forming a solid, goblet-shaped structure, easily identifiable from other components of female gonads. Methods: To study the receptacle, female adult *D. immitis* were collected from naturally infected dogs, transported to UPR-RCM where they were dissected, reproductive system isolated and sections processed by standard procedures for examination by transmission electron microscopy. Comparison was made between wall structure of the receptacle and distal portion of uterus. Results: Examination of thick and thin sections, obtained through the basal portion of receptacle, indicated that thickened uterine wall formed trabeculae projecting into the lumen of the vesicle, providing rigidity to the structure and creating compartments within the vesicle. Spermatozoa, undergoing their second meiotic division, were observed among unfertilized oocytes. Trabeculae were absent in distal portions of the uterus that contained ma-

ture microfilariae; uterine walls in these regions consisted only of basal membrane and epithelial layer. Conclusion: Results suggest that the receptacle has been modified to provide a more rigid and safe area where spermatozoa complete their maturation and be stored as mature spermatozoa for subsequent fertilization of oocytes. Acknowledgements: Supported in part, by RCMI grant G12 MD007600 from the National Institute on Minority Health and Health Disparities of NIH.

**1984 Patients' satisfaction regarding implant-retained prosthesis: A ten year follow-up study**

Aníbal A González Escalante<sup>1</sup>, María A Loza Herrero<sup>2</sup>

<sup>1</sup>Department of Interdisciplinary Sciences, Natural Sciences Faculty, University of Puerto Rico, Rio Piedras Campus, PR; <sup>2</sup>Department of Restorative Sciences, School of Dental Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: As tooth decay may come along with age, oral function may be enhanced when patients are rehabilitated with dental implants. To analyze the effectiveness of implant dentistry, a sort of methods is implemented to measure changes in masticatory performance, speech ability and patient's satisfaction. The aim of this study was to assess the patients' satisfaction towards esthetics, clarity of speech, comfortable chewing including solid foods, and improvement in oral functions regarding to their implant supported prosthesis performed at various clinics of the School of Dental Medicine, UPR. Methods: Patients who had implants placed and restored were identified from clinic records, were contacted and invited for a clinical examination and a questionnaire. From 2006 to 2016, 268 patients were able to participate. Results: The participants were distributed in 4 clinics: 119 Graduate Prosthodontics, 96 DMD, 52, GPR & 1 AEGD Clinics. Generally, patients were satisfied with esthetics (93.13%), clarity of speech (98.86%), comfortable chewing (97.33%) including solid foods (94.32%), and improvement in oral functions (94.32%). A Trend Analysis was performed comparing these variable to the patient's general satisfaction. Conclusions: There is a significant trend, as one satisfaction measure increases, there is a significant increase in the general patient satisfaction. Most of the patients were satisfied by the esthetics and function of their implant-retained prosthesis performed in any of our four clinics at the School of Dental Medicine, MSC, UPR. Acknowledgements: To the Research Deanship SDM, UPR for all the support thru the years and to Dr. Doug Landsittel and Dr. Chengli Shen for their statistical support, University of Pittsburgh.

**1985 Antimicrobial Resistance Patterns in Puerto Rico: A Cross-Sectional Review of Hospital's Antibiograms**

Liza M Castro, Noritza Caraballo, Selimar Ledesma, Brenda Méndez, Glendalis Vargas, Frances M Rodríguez, José J Hernández

School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Antibigrams are instruments for selecting empirical antimicrobial treatments and monitor resistance patterns. This study aims to describe regional antibiograms for the eight health-regions in Puerto Rico and to identify if there is a relationship between the presence of Antimicrobial Stewardship Programs (ASP) and the antimicrobial resistance pattern observed. **Methods:** This cross-sectional study sampled at least two hospitals from each of the eight health-regions. Hospitals with at least two antibiograms from the last three years were included. Antibigrams were compared intra- and inter-regionally using descriptive statistics. The resistance data were merged, creating regional antibiograms using the ten most prevalent pathogens. A questionnaire was utilized to inquire about the existence of ASP and antibiograms. **Results:** The Southeast, North, and Northeast regions were represented by one hospital each, and there was no representation from the Metro-North region. The intra-regional analysis showed the highest resistance for ampicillin in Southwest; piperacillin/tazobactam and ceftriaxone in North; meropenem in San Juan, ciprofloxacin and gentamycin in Northeast; clindamycin in Southeast; and trimethoprim/sulfamethoxazole in East. The West had the lowest resistance. In the inter-regional analysis, susceptible microorganisms (>80%) were: *E. faecalis* to ampicillin; *P. mirabilis* to ceftriaxone, *S. marcescens* to ciprofloxacin, and *S. aureus* to trimethoprim/sulfamethoxazole. All microorganisms evaluated for vancomycin were susceptible. *A. baumannii* presented resistance to all the antibiotics included. From the 12 participating hospitals, 9 did not have an ASP at the moment of data collection. However, 6 were working on one. Susceptibilities of > 80% for some antibiotics were more significant at regions that had ASP. **Conclusions:** This study could help the Department of Health as well as individual hospitals to address resistance and to identify critical areas of opportunity such as the development of ASP. **Acknowledgements:** Prof. Rafael García, Dr. Susette Var, and Dr. Nancy Khardori for their guidance and every participating hospital pharmacy director.

**1992 Assessment of the Clinical Utility of Pharmacogenetic Testing in a Comprehensive Medication Management Service**

*Idaliz Rodríguez Escudero, Julio A Cedeño Alicea, Ileana Rodríguez Nazario, Jonathan Hernández, Jorge Duconge*

School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** The aim of this study is to evaluate the clinical utility of adding pharmacogenetic testing (PGx) information into the pharmacist-driven practice of Comprehensive Medication Management (CMM). Pharmacogenetics is the study of the effects of genetic differences on the obser-

ved variability in response to medications among patients. To our knowledge, this is the first time that PGx-driven recommendations have been incorporated into a CMM service in Puerto Rico; hence, the relevance of this study. **Methods:** This is a pilot study to gather preliminary evidence on clinical benefit of genotyping patients receiving CMM services. Since psychiatric drugs are susceptible to gene-drug interactions, volunteers were recruited from a psychologist's clinic. A total of 20 volunteers had a face-to-face interview with a pharmacist to complete a Comprehensive Medication Review, Personal Medication Record, and Medication-Related Action Plan (MAP) blind to PGx findings. Collected buccal DNA samples were genotyped using DMET Plus Array. With the PGx results, the pharmacist will generate new MAPs for each patient. A sample of 10 pharmacists will evaluate the pre- and post-PGx MAPs and answer a 26-item questionnaire on perception of utility. **Results:** Analyzed patients used, on average, 8.8 prescription drugs and 2.3 non-prescription drugs. On initial pre-PGx evaluation, the pharmacist identified an average of 4.6 medication-related problems per patient. Genotyping identified an average of 5.1 polymorphisms per patient. Most common polymorphisms: CYP2D6\_1661G->C (poor metabolizer, 75%); CYP2D6\_2850C->T (poor metabolizer, 55%); CYP2D6\*2\_4180G->C (poor metabolizer, 55%); CYP2D6\*2a/\*35\_-1584C->G/\_31G->A (ultra-rapid metabolizer, 50%). **Conclusions:** Results show the presence of, at least, one polymorphism that can potentially affect the metabolism of drugs by CYP2D6, CYP2C19 or CYP2C9 enzymes in all patients. Based on these findings, different pharmacotherapy recommendations by the pharmacist are anticipated. **Acknowledgements:** Grant #2U54 MD007600-31 by NIMHD, NIH (RCMI Program). Approved by IRB.

**1998 Etiology, Factors, and Outcomes Associated to Open Elbow Release after Post-Traumatic Elbow Stiffness**

*Francisco López González, Román Guerrero Maestre, Danny Mangual Pérez, Viviana Serra López, Marcantonio Pinci*

University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** This study identifies and analyzes etiologic factors and their multifactorial influence in the outcomes of patients treated with open elbow release after developing elbow stiffness. Functional elbow arc of motion needed to perform activities of daily living include 100 degrees of linear movement and 100 degrees of forearm overall rotation. Direct trauma to the elbow has a positive correlation on the formation of heterotopic ossification around the elbow, leading to elbow stiffness. Heterotopic ossification is the formation of lamellar bone in nonosseous tissues. Newly formed bone around the articulation restricts the arc of motion and can lead to significant disability. **Methods:** After receiving IRB approval, pa-

tients were selected using the procedure code for open elbow joint release, which was traced to the insurance claims at the Department of Orthopaedic Surgery at UPR-RCM, from 1998 to 2014. Data from 240 patients was analyzed. Chi square and Fisher's exact test were used for categorical variables. Results: 54% of the population analyzed was under the age of 40, and 67.9% were male. 20.8% of patients had presented initially with a humerus fracture and 15% had a fracture of one or more bones. The leading cause of the initial trauma was motor vehicle accidents (37.5%), followed by falls (35.1%). Heterotopic ossification was identified in 57.1% of the patients at the time of contracture release. Conclusions: Multiple etiological factors were evaluated, and their potential correlation with the development of HO. Factors such as gender, hypertension and brain injury at the time of the initial trauma were associated with the development of HO. Acknowledgements: We wish to express our appreciation to all the orthopaedic residents at the Department of Orthopaedic Surgery at the University of Puerto Rico Medical Sciences Campus for their support and assistance during this study.

**2002 A Center for the Rapid Analysis of Clinical-grade Biologics: The Biophysical Characterization of HIV-1 Env Protein as a Vaccine Candidate**

*Pearl Akamine<sup>1†</sup>, José A. González Feliciano<sup>1†</sup>, Coral Capó Vélez<sup>1</sup>, Manuel Delgado Vélez<sup>1</sup>, José A Lasalde Dominicci<sup>1,2,3\*</sup>, Abel Baerga Ortiz<sup>1,4\*</sup>*

*<sup>†</sup>Authors contributed equally, <sup>\*</sup>Corresponding authors*

<sup>1</sup>Molecular Science Research Center, University of Puerto Rico, San Juan, PR; <sup>2</sup>Department of Biology, University of Puerto Rico, Río Piedras, San Juan, PR; <sup>3</sup>Department of Chemistry, University of Puerto Rico, Río Piedras, San Juan, PR; <sup>4</sup>Department of Biochemistry, University of Puerto Rico, Medical Sciences Campus, San Juan, PR

**Background and Objectives:** The development of a prophylactic vaccine against the human immunodeficiency virus (HIV) is of paramount importance in the global drive to halt the spread of the virus. The current goal of the Clinical Bioreagent Center (CBC) is to streamline the vaccine development pipeline from a promising lead to the clinic, in part by developing state-of-the-art analytical tools to characterize and to quickly monitor the quality of HIV-1 Env protein, a new vaccine candidate. **Methods and Results:** A method was developed to determine the purity of HIV-1 Env glycoprotein by capillary electrophoresis that provides higher sensitivity of detection of impurities and better resolution as compared to regular gel electrophoresis techniques. Using an Octet QK<sup>®</sup> system, host cell protein content was confirmed using a novel kit that has greater precision and linear range than available kits based on ELISA. Imaged capillary isoelectric focusing results highlight the charge heterogeneity of the recombinant HIV-1 Env protein. The binding affinity

of the broadly neutralizing antibody, 4E10, to the HIV-1 Env protein was determined by biolayer interferometry. The glycan profile obtained by MALDI mass spectrometry showed that the recombinant HIV-1 Env protein glycans are distinct from SF162 gp140. Altogether, these analytical tools can be implemented to ensure that the protein expression and purification conditions do not change the integrity, bioactivity, and therapeutic properties of the vaccine. Furthermore, the methods developed here can be qualified per current good manufacturing practices to facilitate their transfer to a biomanufacturing facility. **Conclusion:** In summary, our experimental tools have been developed to monitor the quality of the HIV-1 Env protein with the goal of boosting production yields to expedite its success onto clinical trials. **Acknowledgements:** Supported by 1 R01 AI122935-01, NIH-NIAID R01AI22935 and by NIH-NIMHD 8G12MD007600.

**2008 EtOH activation of  $\beta$ -catenin signaling promotes TCF/LEF transcriptional regulation and Wnt secretion**

*Kiara M Cardona Jordan, Jessica M Soto Hernández, Katherine Cordero Padilla, <sup>1</sup>Cristina Velázquez Marrero*

<sup>1</sup>Institute of Neurobiology, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Molecular alcohol tolerance includes an important persistent component characterized by the redistribution of the high conductance voltage- and calcium-dependent potassium channel (BK) plasma membrane surface expression. This form of alcohol tolerance has been shown to be mediated by the Wnt/ $\beta$ -catenin signaling pathway and is protein synthesis-dependent after 6 hr ethanol exposure (Velázquez-Marrero et al., 2015; 2016). Redistribution of the BK channel only occurs after 6hr exposure and not 1 or 3 hrs and further persists after 24 hr withdrawal. Studies with *Drosophila* has established that Wnt signaling is a requirement in the formation of long-term memory where impairment was reversible, being rescued by expression of wild type  $\beta$ -catenin (Tan et al., 2013). Changes in the profile of mRNA and miRNA can shape the long-term properties of neurons in response to EtOH. We have thus, initiated a comparative transcriptome analysis of striatal tissue under naïve and 6hr ethanol treatment with 25mM EtOH to further our understanding of the consequences of transcriptional regulation in response to EtOH. Our preliminary results show HEK293 cells stably expressing the ZERO isoform of the BK channel activate LEF/TCF transcription in response to recombinant Wnt3A protein treatment. Cells expressing the alcohol-insensitive isoform of the BK channel, STREX, do not activate LEF/TCF transcription in response to Wnt3A nor EtOH. However, the combination of Wnt3a and EtOH elicits LEF/TCF transcription. Alcohol activation of the Wnt/ $\beta$ -catenin signaling pathway is further supported by the detection of Wnt3A secretion in preliminary experiments. Furthermore, activation of transcription in striatal tissue leads to changes in miRNA pro-

file with potential ties to Wnt/ $\beta$ -catenin gene targets. Research support is provided by: 5P20GM103642 COBRE project grant to CV-M and Research infrastructure support was provided in part by a grant from the National Institute of Minority Health and Health Disparities (8G12 MD 007600).

**2014 Social Isolation Stress Increases Anxiety-like Behavior on Male Sprague Dawley Rats**

*Natalia B Ortiz Bachier, Carlos J Rivero, Jaime A Freire, Ivan G Santiago, Annabell C Segarra*

NSF Partnerships for Research and Education (PIRE) Program (OISE #1545803), University of Puerto Rico Medical Sciences Campus, San Juan, PR

An increasing amount of evidence has linked the effects of early life stress with the development of several psychopathologies, including anxiety, depression and addictive behaviors. Moreover, alterations in dopaminergic signaling have been hypothesized to contribute to the development of these behavioral changes. Here we determined if social isolation of rats during the adolescent period induces changes in behaviors and in the dopaminergic circuitry. Male Sprague Dawley rats were weaned at postnatal day 23, and separated into two distinct groups; the control group (n=10) consisted of group-housed animals while the experimental group (n=10) consisted of individually-housed animals. At day 34 they were tested in an open field (OF) and subsequently in an elevated plus maze (EPM). From day 35-48 each group was subdivided into two groups and then subjected to Cocaine-Induced Conditioned Place Preference (CPP) to test spatial memory and reward-based behavior. Biochemical quantification of changes in dopaminergic signaling was performed through Western blotting for dopamine receptor 2 (DRD2) expression in the prefrontal cortex region. We found that isolated male rats spent more time in the margins of an open field, suggesting less risk-taking behavior. In addition, they spent more time in the closed arms of an EPM than grouped housed males, indicative of increased anxiety-like behavior. Both groups showed conditioning to cocaine. A decrease in DRD2 receptors was found in cocaine treated animals, those that were isolated showed a greater decrease. These data show that isolation stress during adolescence induces changes in anxiety and risk-taking behaviors of male rats. Moreover, cocaine induced a downregulation of DRD2 in the PFC, and this decrease was exacerbated in isolated males.

**2018 Gene Polymorphisms linked to Clopidogrel Response within the Puerto Rican Population**

*Jonnalie C Tomassin<sup>1</sup>, Angélica Cuevas<sup>1</sup>, Jennifer Liriano<sup>1</sup>, Dariana Padilla<sup>1</sup>, Nannette Rivera<sup>1</sup>, Anyelis Rosario<sup>1</sup>, Rocío Vega<sup>2</sup>, Jessica Renta<sup>3</sup>, Héctor Núñez<sup>3</sup>, Dagmar Hernández<sup>3</sup>, Carmen L Cadilla<sup>3</sup>, Jorge Duconge<sup>3</sup>*

<sup>1</sup>University of Puerto Rico, Rio Piedras Campus, PR;

<sup>2</sup>University of Puerto Rico, Bayamón Campus, PR;

<sup>3</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Clopidogrel is an antiplatelet drug commonly used to prevent stent thrombosis perioperatively in patients undergoing percutaneous coronary intervention or to reduce risks of cardiovascular events in coronary artery diseases. This drug effectively inhibits platelet aggregation by irreversibly blocking the P2Y<sub>12</sub> receptor on platelets. However, significant variability in Clopidogrel responsiveness and clinical outcomes has been found among individuals. This study is aimed at ascertaining the frequency distribution of major polymorphisms on *CYP2C19*, *PON1*, *ABCB1* and *P2RY12* pharmacogenes in Puerto Ricans. **Methods:** Samples were collected from the existing biobank at the local Newborn Screening Program by using a population-based, stratified-by-region sampling strategy to be representative of the Puerto Rican population. A total of 200 DNA specimens were extracted, purified and quantified from the corresponding dried blood spotted on filter cards. Taqman<sup>®</sup> SNP assay techniques were used for genotyping. Chi-squared test was used to assess departure from Hardy-Weinberg equilibrium (HWE) and Z-test for proportions was performed to compare prevalence between populations. **Results:** Minor Allele Frequencies (MAF) were 41% for *ABCB1* (rs1045642), 13% for *CYP2C19\*2*, 0.3% for *CYP2C19\*4*, 14% for *CYP2C19\*17*, 46% for *PON1* (rs662) and 12% for *P2RY12-H2*. No carriers of the *CYP2C19\*3* variants were detected. All alleles and genotype proportions were found to be in HWE. Overall, there were no significant differences between MAFs of these variants in Puerto Ricans and the general population (n=453) of the 1,000 Genome project, except for the Yoruba in Ibadan from Nigeria (YRI, West-African ancestry; p<0.05). As expected, the prevalence of these markers in Puerto Ricans most resembled those in the 181 subjects from reference populations of the Americas. **Conclusions:** These prevalence data provide a necessary groundwork for future clinical studies of Clopidogrel pharmacogenetics in Caribbean Hispanics.

**2021 Presence of gastrointestinal parasites in Macaca mulatta in a seasonal and diverse environment: Implications of parasites and sociality on wildlife**

*Carla M Escabi Ruiz<sup>1,2</sup>, Bonn Aure<sup>1</sup>, Marilyn Arce<sup>1</sup>, Melween I Martinez<sup>1</sup>*

<sup>1</sup>Caribbean Primate Research Center, University of Puerto Rico Medical Sciences Campus, San Juan, PR;

<sup>2</sup>School of Science and Technology, Environmental Sciences Department, Universidad del Turabo, PR

**Background & Objectives:** It is important to recognize the growing knowledge that parasites influence nonhuman primate behavior and sociality. Understanding the relationship between parasites and hosts can be very useful for environmental and species management. In addition, these parasite species have a zoonosis potential, which may impact public health. In this

research, the relationship between gastrointestinal parasites (GIP) and nonhuman primate behavioral ecology in the rhesus macaque (*Macaca mulatta*) population of Cayo Santiago, Puerto Rico was investigated. Methods: The subjects of this study were 56 adult male macaques of whom fecal samples and behavioral data were collected for 12 months. GIP species diversity, prevalence, and density were compared between seasons (birth/mating, rainy/dry) and between dominance ranks. Results: The most prevalent species found were *Amoeba* spp., *Balantidium coli*, *Strongiloides fulleborni*, and *Trichuris trichuria*. All animals/samples had at least one parasite species. GIP species diversity was higher during the wet, nonmating seasons and lower ranking males had fewer diversity than higher ranking individuals. GIP prevalence varied depending on species, larger differences found between seasons among medium ranking males. *T. trichuria* was the only species to have a significant difference between the seasons. Density differed among GIP, *Amoeba* spp. having the highest densities and *T. trichuria* the lowest. None of the GIP species were present in high densities. Conclusions: Animals were healthy during the study, which may mean that intermediate virulence is the best option for these GIP species as their fitness will be maximized. This research will broaden the understanding of the relationship between parasites and hosts. Studies like this can help improve captive nonhuman primate lives and the zoonosis potential. In addition, this can be translated into environmental and wildlife management practices in other nonhuman primates or mammal species. Acknowledgements: This research was supported by NIH P40OD012217 and IACUC A350117.

**2023 Oligotyping analysis of gut bacterial genes previously associated with inflammation and colorectal neoplasia**

Rachell Martínez Ramírez<sup>1</sup>; Ramón Gómez Moreno<sup>2</sup>; Josué Pérez Santiago<sup>3</sup>; Abel Baerga Ortiz<sup>4</sup>

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Candidate of Biochemistry at Medical Science Campus, UPR, (Molecular Science Research Center (Lab)- Student of MBRS-RISE program; <sup>3</sup>Assistant Professor, Director of Omics Center, UPR Comprehensive cancer center, Division of Cancer Biology; <sup>4</sup>Catedrático asociado, Department of Biochemistry, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** The colorectal cancer (CRC)-associated intestinal microbiota is characterized by the presence of commensal strains that harbor pro-inflammatory and genotoxic bacterial genes. Some of these bacterial genes like the *pks island*, the uropathogenic specific protein (*usp*), and the *tcpC* gene are present predominantly in CRC cases, but also present in stool samples from healthy individuals. One possibility is that there are specific DNA sequence variants, or oligotypes,

present in CRC stool samples while other sequence variants are associated with healthy phenotype. To detect the presence of nucleotide variants for this set of genes, we performed deep parallel sequencing of the PCR products obtained from stool samples known to be positive for the *pks island*, the *usp* gene, and the *tcpC* gene. Methods: DNA was extracted from stool samples and used as a template for a PCR reaction for the detection of the three bacterial genes. The resulting amplicon was sent to the Sequencing and Genotyping Facility (SGF) for pair-end sequencing using the Illumina platform. The reads obtained were analyzed using the Oligotyping software, a tool for the detection of hotspots of sequence variation along a nucleotide sequence. Results: The amplicons for *pks island* and *tcpC* showed the low levels of heterogeneity that were comparable with that of isolated strains. However, the amplicons for *usp* revealed three distinct oligotypes in two different regions. The oligotype "AC" was the most abundant one whereas the "GT" oligotype was the one associated with the uropathogenic control strain and with two CRC cases. This variability in the nucleotide sequence translates to variability in the protein sequence, switch position 110 of the pyocin domain containing either Gln or Leu, and also in the middle of the nuclease domain with the positions 218 and 221 which could either contain Arg and Leu or His and Pro, respectively. Conclusions: Our results indicates the presence of sequence variants for virulence genes that could influence colon carcinogenesis. Further studies are warranted to investigate the impact of sequence variation on carcinogenesis. Acknowledgements: This research was supported by NIGMS-RISE R25 GM061838.

**2025 Towards an accurate anatomical measurement of the human liver: lessons from Ultrasound and MRI**

Jancarlo Lugo Rosado<sup>1</sup>, Bárbara Riestra<sup>2</sup>, Juan Carlos Jorge<sup>2</sup>

<sup>1</sup>MD Program, <sup>2</sup>Department of Anatomy and Neurobiology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background and Objectives:** Medical imaging is an important aspect of modern medicine to diagnose what the naked eye cannot perceive. Accurate liver measurements can offer important clinical insights when pathology is suspected. Traditionally, ultrasound measurement of the right liver lobe (RLL) in anteroposterior (AP) and craniocaudal (CC) views have been favored because it is cost-effective and safe, but has been criticized for offering operator-dependent measures. We have previously shown with cadaveric specimens that midaxillary line (MAL) CC measurement of the RLL is a promising anatomical approach to more accurately measure the organ. The aim of this study is to compare ultrasound and MRI measurements of the RLL in healthy living subjects according to sex. Methods: Blood testing was employed to assess basal liver health (n=10/sex). Ultrasound imaging was taken by using GE Logic E9 machine

with a C1-5MHz transducer with the conventional approach and with our hypothesis-driven approach, and then contrasted with 3D LAVA Flex sequences acquired on a 3T MRI during breath-hold. Measurements were taken from coronal and sagittal slices with an in-plane resolution of 1.1 mm x 1.4 mm and a slice thickness of 2.4 mm, and 1.0 mm x 1.1 mm and a slice thickness of 2.6 mm, respectively. Results: Ultrasound MAL-CC panoramic view measurements shows the strongest correlation with MRI measurements ( $r^2= 0.78$ ), especially among females ( $r^2= 0.87$ ). Conclusions: Ultrasound imaging can provide accurate measurement of the RLL in MAL-CC panoramic view where "MAL" is defined as a line between anatomical mid clavicular line (MCL) and MAL. Sharing this important caveat among medical imaging practitioners is warranted. Acknowledgments: The study received IRB approval, MSC-UPR and was supported by NIMHD and NIAID (U54MD007587). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

**2026 Phthalates affect synaptic growth and stability at the Drosophila NMJ**

*KM De León González, B Marie*

Background: Dibutyl phthalate (DBP) is a plasticizer used in everyday products. Phthalates are not chemically bound to their polymer matrix and can leach-out into the environment. Little is known about the effects of DBP on the nervous system. Studies have shown that DBP acts as a teratogen and as an endocrine disruptor. In addition, recent studies have linked DBP to apoptosis and neurotoxicity in mouse and rat models. Methods: In the present study, we address the effect of DBP at the neuromuscular junction (NMJ). We characterized a variety of synaptic markers: vesicle marker synapsin, microtubule-associated protein (MAP1B homolog), active zone associated protein (CAST homolog), and the postsynaptic marker discs-large (PSD-95 homolog). The animals were reared with a milieu containing environmentally relevant concentrations of DBP (0.02-20 ppm). Results: Synapses from animals reared in milieu at different concentrations of DBP showed a growth that was 80% of control synapses. In addition, the animals reared in milieu with DBP showed synaptic retractions. These retractions are defined by the presence of postsynaptic markers and the absence specific presynaptic markers. We found that the frequency of retraction to be dose dependent, where up to 30% of the synapses observed, showed synaptic retractions phenotype at 20 ppm. We observed that the animals exposed to DBP have boutons deficient in MAP1B and CAST. We expanded our research to determine if different phthalates had similar effects on the synapse. Indeed, when exposed to di-2-ethylhexyl-phthalate (DEHP) animals showed a reduction in synaptic growth and 41% retraction frequency. In contrast, exposing animals to benzylbutyl-phthalate, diisononyl-phthalate and diisodecyl-phthalate had no effect on synapse growth

nor retraction frequency. Conclusion: These results correlate with the literature describing higher chained phthalates safer than shorter chained. This study shows that specific phthalates, such as DBP and DEHP can affect synaptic growth and stability. Acknowledgments: NSF-CREST-HRD-1137725, MBRS-RISE-2R25GM061838-18

**2037 African genetic ancestry is associated with BRAF-mutated colorectal tumors and distal location in Puerto Rican Hispanics with colorectal cancer**

*Julyann Pérez Mayoral<sup>1</sup>, Marievelisse Soto Salgado<sup>2</sup>, María Gonzalez Pons<sup>1</sup>, Ebony Shah<sup>6</sup>, Rick Kittles<sup>6</sup>, Mariana Stern, Kimberly Alicea Zambrana<sup>1</sup>, Belisa Suarez<sup>1</sup>, Myrta I Oliveras<sup>3</sup>, Segundo Rodriguez Quilichinni<sup>4</sup>, Marla Torres<sup>5</sup>, Samuel Reyes<sup>5</sup>, Luis Tous<sup>5</sup>, Nicolas López, Victor Carlo Chevere<sup>4</sup>, Marcia Cruz Correa<sup>1,4</sup>*

<sup>1</sup>Division of Cancer Biology, University of Puerto Rico Comprehensive Cancer Center, San Juan, PR; <sup>2</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Department of Medicine, Universidad Central del Caribe, Bayamon, PR; <sup>4</sup>Department of Biochemistry and Medicine, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>5</sup>Colorectal Surgery Clinic, Ashford Presbyterian Hospital, San Juan, PR; <sup>6</sup>Department of Surgery, Division of Urology, University of Arizona College of Medicine, Tucson, AZ, USA

Background: Colorectal cancer (CRC) is the 1st cause of cancer deaths in Puerto Rican Hispanics (PRH). The incidence and mortality of CRC in Puerto Rico continues to be on the rise, and is second only to Blacks and higher than US Hispanics, thus supporting the importance of studying this cancer as a health disparity. The genetic background of the Puerto Rican population is mix of European, African and Amerindian races, could account, at least in part, for the differences observed in the CRC mortality rates in PRH. The objective of the study was to assess the role of genetic ancestry in CRC risk and its association with clinicopathological features of CRC tumors in PRH. Methods: We used a panel of 105 ancestry informative markers (AIMs) to estimate genetic ancestry in 406 PRH CRC cases and 425 PRH controls. We examined the association of genetic ancestry estimates with CRC risk and tumor clinicopathological characteristics using Pearson's Chi Square, Fischer's Exact Test and Logistic Regression analysis. Results: CRC cases in our study were older ( $p<0.001$ ), male ( $p<0.001$ ) and less educated ( $p<0.001$ ) than controls. Mean ancestry proportions in the study population were 61% European, 20% African and 18% Amerindian. No association was observed between genetic ancestry and risk of CRC. Moreover, high levels of African ancestry were associated with distally located tumors (OR=2.70, 95% CI: 1.42-5.13) and with BRAF-mutated tumors (13.37 (1.46-122.30)). Con-



clusion: Our results show that African ancestry is associated with CRC tumor characteristics in the PRH population. Additional studies are needed to fully elucidate the role of African ancestry in CRC carcinogenesis. Acknowledgements: This work was partially supported by the National Institute on Minority Health Disparities award number 8U54MD 007587-03 and U54MD007587; the National Cancer Institute award numbers SK22CA115913-03, R21CA167220-01, SR03CA130034-02, and U54CA096297; and U54MD007587.

#### **2042 Identification of a Novel Compound with Antimalarial Activity**

*Emilee E Colón Lorenzo<sup>1</sup>, Alexis G Cotto Rosario<sup>2</sup>, Sara Delgado<sup>3</sup>, Ingrid Montes<sup>3</sup>, Jose G Ortiz<sup>4</sup>, Jürgen Bosch<sup>5,6</sup>, Adelfa E Serrano<sup>1</sup>*

<sup>1</sup>Department of Microbiology and Medical Zoology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Biology Department, University of Puerto Rico, Cayey Campus, San Juan, PR; <sup>3</sup>Chemistry Department, University of Puerto Rico, Río Piedras Campus, San Juan, PR; <sup>4</sup>Pharmacology Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>5</sup>Case Western Reserve University, Division of Pediatric Pulmonology and Allergy/Immunology, Cleveland, Ohio, USA; <sup>6</sup>InterRayBio, LLC, Baltimore, Maryland, USA

**Background & Objectives:** Malaria is the most deadly parasitic disease worldwide. Resistance to Artemisinin, the latest antimalarial introduced in the market, has been reported. The development of multidrug resistant malaria parasites continues to represent a real threat for malaria control. Our long-term goal is to identify, validate, and transfer lead compounds to the antimalarial pipeline. Recently, we validated that the *Plasmodium berghei* glutathione S-transferase (pbGST) is crucial for parasite development in the asexual stages validated as a drug target. **Methods:** Structure-based *in silico* screening of small compounds against the pbGST 3D model was done using the ChemBridge library. Initial steps for preclinical evaluation of the compounds were done including: *in vitro* drug assay, predicted pharmacological properties, erythrocyte lysis and cytotoxicity assays. **Results:** Screening of 900,000 small compounds resulted in a total of 2,000 virtual library hits which were visually inspected for each pbGST binding sites (G and H sites) and 40 compounds were identified as potential inhibitors. Interestingly, one small compound displayed *in vitro* antimalarial activity at low nanomolar concentration (~500 nM) and two other compounds at micromolar concentrations. Initial preclinical evaluation parameters of the novel compound showed: a) lack of hemolytic activity then feasible to be used as antimalarial; and b) lack of mammalian cytotoxicity as tested in a mammalian lung fibroblast cells cytotoxic assay. GST inhibition assay using protein

parasite extract showed that the compound presents a concentration dependent inhibition. **Conclusion:** A compound was identified with antimalarial activity that inhibits the pbGST target. This work will contribute to identifying novel compounds that will ultimately translate into malaria therapeutic use. **Acknowledgements:** This research was partially supported by the Puerto Rico Science, Technology & Research Trust; NIMHHD grants 8G12MD007600 and U54MD007600.

#### **2043 Ecological Sampling and Vector Capacity Potential of the Malaria Vector Anopheles Mosquito in Two Holdridge Life Zones in Puerto Rico**

*Daniel W Pérez Ramos<sup>1,3</sup>, Shamika D Mathis Torres<sup>1,3</sup>, Emilee E Colón Lorenzo<sup>1</sup>, Juan C Orengo<sup>2</sup>, Adelfa E Serrano Brizuela<sup>1</sup>, Iván Ferrer Rodríguez<sup>3</sup>*

<sup>1</sup>University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Ponce Health Sciences University, Ponce, PR; <sup>3</sup>Inter American University of Puerto Rico, Bayamón Campus, PR

**Background & Objectives:** During June 2015, five confirmed cases of imported malaria were reported in Puerto Rico in travelers from the Dominican Republic. This event raised the possibility of re-introduction of malaria in the island due to previous reports showing the presence of *Anopheles albimanus* mosquitoes in Puerto Rico. Our aim was to evaluate the presence of *Anopheles spp.* and the potential of re-introducing malaria in the Island by assessing: (1) the distributional data about mosquitoes' population, and (2) the malariogenic potential capacity of a malaria vector. **Methods:** Four Experimental Agricultural Sub-stations (EAS) of the University of Puerto Rico were selected as a representation of two *Holdridge* Life Zones (HLZ) and ponds inside the stations were identified as mosquitoes breeding sites. Mosquitoes were collected using the CDC Miniature UV light trap and later classified. Malariogenic potential capacity was estimated using the  $VC = ma^2p^n / -lnp$  (Macdonald's formula for Vector Capacity). **Results:** A total of 476 mosquitoes were identified from 6 genera: *Anopheles*, *Aedes*, *Culex*, *Mansonia*, *Psorophora* and *Uranotania*. In the Sub-Tropical Moist Forest, 22 species belonging of 6 genera were found while in the Sub-Tropical Dry Forest, 14 species belonging of 4 genera were found. Two *Anopheles* species, *An. grabhamii* and *An. vestitipennis*, were identified in the four EAS. Preliminary results showed that the VC of *An. vestitipennis*, a vector reported to carry malaria, were higher in the Sub-Tropical Dry Forest than in the Sub-Tropical Moist Forest for *Plasmodium vivax* and *Plasmodium falciparum* infections. **Conclusion:** This study shows that the Sub-Tropical Moist Forest, which represent more than half of the HLZs of the Island, is the most abundant on mosquito species richness. The presence of *Anopheles vestitipennis* in Puerto Rico represent a potential risk for malaria transmission. **Acknowledgements:** This study was partially supported by the NIMHHD grant U54MD007600.

**2047 Sobrecarga y trastornos del sueño en los cuidadores de pacientes con Alzheimer**

*Ileana Viltres, RN, MSNs; Juliany Quiles, RN, MSNs; Sherily Pereira, RNA, PhD*

Escuela de Enfermería, Universidad de Puerto Rico  
Recinto de Ciencias Médicas, San Juan, PR

**Antecedentes/Objetivos:** El deterioro paulatino de la persona con demencia supone que las actividades de la vida cotidiana pasen a ser una función asumida por el cuidador, quien dedicará gran parte de su tiempo a atender a la persona enferma. El poseer tales responsabilidades y brindar una atención de constante monitoreo puede provocar en el cuidador sobrecarga y por consiguiente trastornos del sueño. Los objetivos de esta investigación incluyeron: a) describir los trastornos del sueño en los cuidadores primarios de pacientes con Alzheimer; b) describir el nivel de sobrecarga en los cuidadores primarios de pacientes con Alzheimer y c) establecer la asociación entre sobrecarga y trastornos del sueño en los cuidadores primarios de pacientes con Alzheimer. **Metodología:** Estudio descriptivo, correlacional, transversal. Se reclutaron 52 participantes y se les aplicaron los instrumentos: Entrevista de la sobre la carga del cuidador y el Cuestionario de la Somnolencia Epworth. **Resultados:** Participaron 38 mujeres y 14 hombres entre las edades de 23 y 83 años, con una media de  $59 \pm 13$  años. Se obtuvo una correlación positiva entre sobrecarga y trastornos del sueño en los cuidadores de pacientes con Alzheimer ( $r_s = .36$ ,  $p < .01$ ). Los resultados reflejaron un nivel de sobrecarga intensa con una media de  $40.9 \pm 18.5$  y una somnolencia excesiva con una media de  $9.6 \pm 6.2$ . **Conclusión:** Los cuidadores primarios de pacientes con Alzheimer que participaron en esta investigación presentaron asociación entre el nivel de sobrecarga intensa y un nivel elevado de somnolencia. Este hallazgo sugiere que se deben continuar estableciendo programas de apoyo para los cuidadores primarios y las familias de pacientes con Alzheimer en Puerto Rico. **Reconocimiento:** Asociación de Alzheimer de PR y la Organización OPAPA por el apoyo ofrecido durante el reclutamiento de participantes. IRB-RCM (#B1480117)

**2052 Effects of Sodium Pump Inhibition in the Response of the Rat Trachea to Peroxide under Electrical Field Stimulation in Low Temperature Conditions**

*Luis Biescas<sup>1</sup>, Juan Pagan, Ioanis Torres<sup>2</sup>, Guido Santacana<sup>2</sup>*

<sup>1</sup>Dept. of Biology University of Puerto Rico, Río Piedras Campus, PR; <sup>2</sup>Dept. of Physiology & Biophysics, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background and objectives:** Contraction of airway smooth muscle is enhanced by low temperature, a well-known trigger of asthma an effect enhanced by sodium pump (SP) inhibition. Reactive Oxygen Species (ROS) are a component of inflammatory reactions like those involved in asthma but their role

during low temperature conditions is not well documented. We investigated the role of the SP in the mechanism by which peroxide ( $H_2O_2$ ) alters the response of the Electrical Field Stimulated (EFS) "in vitro" rat trachea (RT) at normal (37°C) and low (18°C) temperature. **Methods:** RTs from male Sprague Dawley rats were mounted in an isolated organ system and stimulated with EFS (40V, .5ms at 2Hz) at 37°C and 18°C in the presence and absence of  $H_2O_2$  (.3mM) and after incubation with Ouabain (Ou  $10^{-4}M$  &  $10^{-3M}$ ) a sodium pump inhibitor. The data was recorded with a Grass FT.03 transducer, Grass FB7 amplifier and National Instruments recording program. Paired t statistics were used to analyze the data. **Results:** The presence of  $H_2O_2$  relaxed the EFS contracted RT at 37°C and 18°C. The relaxation was lower at 18°C but it was not present under SP inhibition. **Conclusion:** The experiment suggests that in low temperature environments the sodium pump may play a role in mediating the effects of ROs derived from peroxides during the inflammatory reactions related to asthma. **Acknowledgements:** Supported by the UPR School of Medicine.

**2055 Simvastatin Improvement of Cardiovascular Status in Diabetes; A Quantitative Proteomic Approach**

*Díaz Y<sup>1</sup>, Miranda E<sup>2</sup>, Jorge I<sup>3</sup>, Camafeita E<sup>3</sup>, Mesa R<sup>3</sup>, Vázquez J<sup>3</sup>, Crespo MJ<sup>4</sup>, Serrano H<sup>2,5</sup>*

<sup>1</sup>Universidad de Puerto Rico, Río Piedras Campus, PR; <sup>2</sup>Internal Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Centro Nacional de Investigación Cardiovascular (CNIC), Madrid, España; <sup>4</sup>Physiology and Anesthesiology Department, <sup>5</sup>Biochemistry Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Statins improve cardiovascular status of diabetic patients, regardless of their cholesterol levels. The underlying mechanisms remain unclear. In this project, we evaluated and compared the effect of simvastatin on the regulation of proteins that code for vascular development and blood pressure homeostasis, in the cardiac proteome of diabetic and non-diabetic rats. **Methods:** Proteins were extracted from cardiac tissue samples of diabetic and non-diabetic rats after daily administration of simvastatin (10 mg/kg/day) over a four-week treatment period. After tryptic digestion, protein concentration was determined and quantified, and proteins were concentrated by electrophoresis. Samples were processed for peptide labelling by isobaric tagging (iTRAQ/4-plex), and liquid-chromatography coupled to mass-spectrometry (LC-MS/MS Q-Exactive™). Generated data were analyzed using the WSPP (weighted spectrum, peptide, and protein) statistical model and system biology analysis. Uniprot, Geneontology Panther Classification System and Ingenuity pathway analysis were used for the description of the proteins. **Results:** A total of 2203 proteins were identified and quantified with more than 1

peptide. A total of 66 proteins presented significant change in expression (false discovery rate (FDR) < 0.05) with more than 2 peptides. These proteins are involved in catalytic activity, metabolic processes, and cell structure. Specifically, 17 are related to vascular development, 12 to angiogenesis, and 6 to blood pressure regulation. In simvastatin-treated diabetic rats, protein P01161, which plays a key role in cardiovascular homeostasis was down-regulated. Conclusion: These findings could lead to a better understanding of the mechanisms underlying the beneficial effects of simvastatin in the cardiovascular profile of diabetic patients, and to the identification of new biomarkers for this condition. Acknowledgements: RCMi Proteomics CORE LAB, CCC-UPR. Approved by IACUC.

**2058 Characterization of Endometrial Cancer Donors at the UPR Comprehensive Cancer Center Biobank**

*María I Álvarez Cardona, BS<sup>1</sup>; Cristina I Castro Muñoz, MS<sup>1</sup>; Ivette Rodríguez Angleró, MS<sup>1</sup>; Emilio Jiménez Ortiz, MD<sup>2</sup>; María de Lourdes Marín, MD<sup>1,2</sup>; Edna M Mora Piñero, MD, MS<sup>1,3</sup>*

<sup>1</sup>University of Puerto Rico Comprehensive Cancer Center, San Juan, PR; <sup>2</sup>I. González Martínez Hospital, San Juan, PR; <sup>3</sup>Department of Surgery, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Endometrial Cancer (EC) is the most common gynecologic malignancy worldwide, including Puerto Rico. To answer important clinical questions, high-quality well-annotated biospecimens with their associated clinical data are needed. To fulfill this gap, the UPR Comprehensive Cancer Center Biobank developed a prospective collection of EC. The purpose of this study was to describe the donor's clinical characteristics. Methods: After IRB approval and informed consent, EC biospecimens and their associated clinical data were obtained. Data audits were performed on a random sample of 10% of cases. Results: From 2013-2016, 87 donors were recruited. The mean age was 59 ±11.0 and the BMI 33.0 ±6.6. Sixty percent (41/68) of the donors were obese and 28% (19/68) overweight. Housewives 54% (47/87) and retirees 15% (13/87) were the most common occupations. Donor's comorbidities include: hypertension 56% (38/68) and diabetes 28% (19/68). Sixty-six percent (57/87) of the donors had family history of cancer. Evaluation of the information showed that: 1) all donors had consents signed prior to participation in the study 2) all clinical data was available in the Biobank electronic database, and 3) most of the information obtained from the donors correlate with medical record information. Conclusion: To our knowledge, we established the first prospective collection of EC specimens and its associated clinical data in Puerto Rico. Based on our findings, we concluded that: 1) the characteristics of our donors corresponded to the expected characteristics of this population, 2) there is a lack of reproductive history in our questionnaire, and 3) there was a lack of

information related to toxic habits in the medical record. This collection will support EC translational research by providing high-quality data from the donors. Acknowledgements: We acknowledge the support from the Department of Surgery, Clinical Pathology, Operating Room, and Pre-admissions at the I. González Martínez Hospital.

**2063 Neural-derived CD63+Rab5+ exosomes carry dysfunctional IRS-1 serine/tyrosine phosphorylation in response to HIV-1 Tat protein**

*Janice G Lozada Delgado<sup>1</sup>, Bryan Collazo<sup>1</sup>, Kalisha Ortiz<sup>1</sup>, Rafael J Ruiz<sup>1</sup>, Valerie Wojna<sup>2</sup>, Yamil Gerena<sup>1</sup>*

<sup>1</sup>Pharmacology and Toxicology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Neurology Division, University of Puerto Rico, Medical Sciences Campus, San Juan, PR

Background & Objectives: Insulin resistance and cognitive impairment have been identified in HIV-infected patients. However, the mechanisms responsible for these comorbidities remain to be clarified. Exosomes released by neurons is one of the mechanisms responsible for the delivery of pathogenic proteins to neighboring cells. We hypothesized that proteins associated with impaired insulin receptor signaling can be released from neuronal cells in response to HIV-1 Tat in different exosome subpopulations (CD63+Rab5+, CD63-Rab5+). Objective: In this study we investigated if IRS-1 phosphorylated proteins can be released in different exosome subpopulations from neuronal cells exposed to Tat and if the ratio between serine/tyrosine phosphorylation (pSer/pTyr) changes in response to the viral protein. Methods: Human neuronal cells (SH-SY5Y; 5x10<sup>5</sup> cells) were cultured in presence of Tat (100nM) for 24hrs. Exosomes were isolated from the cell culture supernatant by ultracentrifugation (100,000xg) and incubated with aldehyde/sulfate beads overnight at 4°C. Exosome-coated beads were incubated with CD63-Alexa-647 and Rab-5b-PE antibodies for 1hr at 4°C. Then, exosomes were permeabilized using the BD Cytofix\Cytoperm Kit and incubated with anti-IRS-1-tyrosine or anti-IRS-1-serine antibodies followed by PerCP-Cy5.5 or FITC-secondary antibody. In addition, glucose uptake (GU) was measured by incubating cells with 2-NBDG fluorescent glucose (10µM) and insulin (100nM) for 30min. All samples were analyzed by flow cytometry. Results: Our data revealed that HIV-1 Tat increased the secretion of IRS-1 phosphorylated proteins in CD63+Rab5+ exosomes when compared to untreated. Moreover, the ratio between pSer/pTyr increased in both exosomes and neuronal cells exposed to Tat. In addition, HIV-1 Tat significantly reduced (p<0.05) insulin-induced GU in neuronal cells. Conclusions: Our results support that HIV-1 Tat mediates the secretion of dysfunctional phosphorylated IRS-1 in exosome subpopulations. The deleterious effects observed in GU may be related to the release of these phosphorylated proteins. Acknowledgements: This research was su-

pported by R01NS099036, R21MH095524, U54MD007587, U54NS043011, S11NS046278, U54MD007600.

**2064 Modulation of nicotinic receptors by cannabinoids**

Carla S Rodríguez Tirado<sup>1</sup>, Orestes Quesada González<sup>2,3</sup>, José A Lasalde Dominicci<sup>1,3</sup>, José O Colón Sáez<sup>4</sup>

<sup>1</sup>Department of Biology, University of Puerto Rico, Río Piedras Campus, San Juan, PR; <sup>2</sup>Department of Physical Sciences, University of Puerto Rico, Río Piedras Campus, San Juan, PR; <sup>3</sup>Molecular Science Building, University of Puerto Rico, San Juan, PR; <sup>4</sup>Department of Pharmaceutical Sciences, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

The legalization of medicinal and recreational use of marijuana by many states in the USA, has resulted in an increase in its use. The two most abundant phytocannabinoids in marijuana  $\Delta$ 9-Tetrahydrocannabinol (THC) and cannabidiol (CBD) have been shown to have tremendous therapeutic potential in many neurological disorders such as anxiety, seizures, post-traumatic stress disorder and pain. One study showed that CBD use reduces cigarette consumption by 40%. However, little is known about the effects that these phytocannabinoids have on the function of nicotinic acetylcholine receptors (nAChRs). Published results showed that CBD reduces the response of the  $\alpha$ 7 nAChR to acetylcholine (ACh). Through this project we are characterizing the effects of CBD and THC on the function of the  $\alpha$ 7 nAChR. Our results indicate that CBD reduces the response of the  $\alpha$ 7 nAChR to ACh by 49% (pvalue=0.0003); and that CBD alone does not activate the receptor. Interestingly, THC seems to have the opposite effect, it appears to increase the response of the  $\alpha$ 7 nicotinic receptor to ACh by a 128% (pvalue=0.44). When both drugs were combined at a 1:1 ratio, the observed effect was an inhibition. The effect was intermediate to the effect seem with either drug alone, the observed response was 62% of the normal response (pvalue=0.007). The response of the  $\alpha$ 7 nicotinic receptor to CBD and THC seems to be independent of the concentration of ACh applied. Which suggests that neither CBD nor THC compete with ACh for the binding site. Dissecting the effects of phytocannabinoids found in marijuana on the nervous system is critical to increase our chances of using it successfully in the clinic.

**2067 Assessment of Composite Sensor Array as Process Analytical Technology (PAT) for Quality Control of Aqueous Formulations**

Mery Vet George De la Rosa<sup>1,2</sup>, Roberto Santiago<sup>2,3</sup>, Jorge Duconge<sup>1</sup>, Rodolfo Romañach<sup>4</sup>, Torsten Stelzer<sup>1,2</sup>

<sup>1</sup>Department of Pharmaceutical Sciences, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Crystallization Design Institute, Molecular Scien-

ces Research Center, University of Puerto Rico, San Juan, PR; <sup>3</sup>Department of Mathematics, University of Puerto Rico, Río Piedras Campus, PR; <sup>4</sup>Department of Chemistry, University of Puerto Rico, Mayaguez Campus, PR

Background & Objectives: Active pharmaceutical ingredients (APIs) are traditionally produced through time- and cost-intensive large-scale batch manufacturing. The limitations of this approach have been revealed by the Food and Drug Administration (FDA) to be root causes for drug shortages, a major problem in today's pharmaceutical manufacturing. A potential solution to overcome this threat is small-scale, end-to-end continuous manufacturing platforms that integrates synthesis, purification, and formulation within the same uninterrupted microfluidic reactor network. This approach possesses a unique high demand on process analytical technology (PAT), for instance, to monitor and determine the strength of aqueous formulations (solution and suspension) *in situ* and in real-time prior to the release from the platform. The aim of this study is to evaluate the application of a composite sensor array (UV-vis, NIR, Turbidity, Temperature) as a versatile, reliable, cost-effective, and small-scale PAT tool to measure the concentration of aqueous pharmaceutical formulations (solution/suspension). Methods: Four APIs, warfarin sodium and lidocaine hydrochloride, formulated as solutions and acetaminophen and azithromycin formulated as suspensions were measured in their commercial aqueous forms using the composite sensor array. The results were compared with a commercially available *in situ* Raman probe to provide a reference for the assessment of real-time monitoring. In addition, the concentrations of all formulations were analyzed by partial least squares (PLS) regression, validated and correlated with offline UV-vis spectrophotometer. Results: Results show PLS regressions of  $R^2 = 0.9958$  with a Bias = 0.061, which correlated well with offline measurements. Conclusions: The composite sensor array has potential as an *in situ* real-time PAT for concentration monitoring of aqueous formulated drugs (solution and suspensions) in one single PAT device, as it is preferred in pharmaceutical manufacturing platforms to maintain a small footprint. Acknowledgements: This research was supported by the PR Forward Trust (Award 2016-00082) and National Science Foundation (Award 0540855).

**2070 Andrographolide Induces a DNA Damage Response in Prostate Cancer via DNA Double Strand Breaks**

Andres Lopez Rivas<sup>1,3</sup>, Gretchen Nieves<sup>1,3</sup>, Ingrid S Forestier Román<sup>2,3</sup>, María M Sánchez Vázquez<sup>3</sup>, Krizia Rohena Rivera<sup>2,3</sup>, Humberto Ortiz Zuazaga<sup>4</sup>, Carlos A Torres Ramos<sup>5</sup>, Magaly Martínez Ferrer<sup>2,3,6</sup>

<sup>1</sup>Department of Biology, University of Puerto Rico, Río Piedras Campus, PR; <sup>2</sup>Department of Biochemistry, School of Medicine, University of Puerto Rico

Medical Sciences Campus, San Juan, PR; <sup>3</sup>University of Puerto Rico Comprehensive Cancer Center; <sup>4</sup>Department of Computer Sciences, University of Puerto Rico, Rio Piedras Campus, PR; <sup>5</sup>Department of Physiology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>6</sup>Department of Pharmaceutical Sciences, School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Prostate cancer (PCa) is the second most common diagnosed cancer and is the fifth cause of cancer mortality in men worldwide. Although in United States, PCa is the most common diagnosed cancer and is the third cause of cancer mortality in men. Andrographolide has been found to inhibit prostate cancer progression but the mechanism of action remains unknown. Therefore, in this study, we aim to determine the mechanism of action of Andrographolide in PCa. **Methods:** Androgen-independent and androgen-dependent cell lines were treated with Andrographolide to determine the effect in cell motility, cell proliferation, apoptosis and the expression of DNA damage response genes in vitro. Tumor growth was evaluated using an orthotopic xenograft model in which the prostates of SCID mice were injected with 22RV1, and mice were treated three times per week with Andrographolide 10 mg/kg. **Results:** In this study, we report that Andrographolide decreased PCa cell migration, decreased invasion, and increased cell apoptosis in vitro. In vivo studies showed that Andrographolide decreased tumor volume, MMP11 expression and blood vessels formation. Gene expression analysis identified cellular compromise, cell cycle, and "DNA recombination, replication and repair" as the major molecular and cellular functions altered in tumors treated with Andrographolide. Flow cytometry analysis showed that Andrographolide increased significantly H2AX phosphorylation and double strand breaks in PCa cells. **Conclusions:** This study confirmed that Andrographolide increases significantly H2AX phosphorylation in PCa, and therefore induced DNA damage response through double strand break repair pathway. **Acknowledgements:** This work was funded by Institutional funds from the University of Puerto Rico Comprehensive Cancer Center and the School of Pharmacy. HOZ was supported in part by NIH-NCI grant U54CA096297.

**2077 GW4869 and Allopurinol Regulate the Release of Exosomal Reactive Oxygen Species from Human Neuronal Cells Exposed to HIV-1 Tat**

*Bryan J Collazo Rodríguez<sup>1</sup>, Kalisha N Ortiz<sup>1</sup>, Janice G Lozada<sup>1</sup>, Rafael J Ruiz<sup>1</sup>, Radamés Revilla<sup>1</sup>, Valerie Wojna<sup>2</sup>, Yamil Gerena<sup>1</sup>*

<sup>1</sup>Pharmacology and Toxicology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Neurology Division, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Exosomes released from neuronal cells have emerged as possible mediators of neurotoxicity in the brain of HIV-infected patients. They can transport Reactive Oxygen Species (ROS) that can exert deleterious influence on other target cells. We hypothesized that pharmacological agents capable of inhibiting exosome release and ROS generation in neuronal cells exposed to HIV-1 Tat protein reduce the secretion of ROS in exosomes. **Objective:** In this study we investigated if GW4869 and Allopurinol, inhibitors of exosome release and ROS generation, respectively decrease the secretion of exosomes with ROS from neuronal cells incubated with Tat. **Methods:** Human neuronal cells (SH-SY5Y; 5x10<sup>5</sup> cells) were cultured in presence of Tat (100nM) for 24hrs and the percentage of exosomes with ROS and ROS levels per exosome were measured by flow cytometry. Exosomes with ROS were also analyzed in culture medium of cells exposed to Tat plus GW4869 (5µM), Tat plus Allopurinol (10µM), and Tat plus a combination of both drugs. Exosomes were isolated from medium by ultracentrifugation (100,000xg) and incubated with aldehyde/sulfate beads. Exosome-coated beads were incubated with CD63-Alexa-647, Rab-5b-PE, and ROS detection reagent and then samples were analyzed using FACS Aria flow cytometer. **Results:** Tat increased significantly (p<0.05) the percentage of exosomes with ROS and ROS levels per exosome released to the extracellular medium. GW4869 decreased significantly the percentage of exosomes with ROS in cells exposed to Tat. Allopurinol decreased significantly the ROS levels per exosome in Tat-incubated cells. Both the GW4869 and Allopurinol decreased significantly the percentage of exosomes with ROS and ROS levels per exosome in Tat-treated cells. **Conclusions:** Our findings support that Tat has a role in exosomal ROS generation and secretion. The effects observed with both, GW4869 and Allopurinol, may help to identify targets that may lead to evaluate novel treatments and understand the mechanisms leading to HAND. **Acknowledgements:** This research was supported by R01NS099036, R21MH095524, U54MD007587, U54NS043011, S11NS046278, U54MD007600, 2R25GM061838-18.

**2079 The role of lateral orbitofrontal projections in a rodent model of persistent avoidance**

*José E Pérez Torres, Carlos I Huertas Pérez, Marcos Sánchez Navarro, Coraly D Velázquez Díaz, Freddyson J Martínez Rivera, Gregory J Quirk*

Departments of Psychiatry and Anatomy & Neurobiology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Active avoidance is an active response to escape from threats. However, excessive avoidance, even in the absence of danger, can produce detrimental effects. To model avoidance in rodents, we used a platform-mediated avoidance task, where rats are conditioned to avoid a tone that

predicts a shock by stepping onto a platform. Subsequently, rats undergo extinction with response prevention (Ext-RP) where the tone-shock association was extinguished by blocking the access to the platform while presenting the tone without the shock. On the following day, the barrier is removed and the rats are tested for the transfer of extinction learning by measuring the time on platform as an index of persistence. Interestingly, previous data from our lab showed that pharmacological inactivation of the lateral orbitofrontal cortex (IOFC) induced persistent avoidance in rats (Rodríguez-Romaguera, 2016). However, although IOFC is associated with excessive avoidance, the specific role of its projections remains undetermined. Methods: To address this, we used an optogenetic approach consisting of infusing a genetically engineered virus to allow neuronal expression of light-sensitive ion channels in axon terminals. To photoinhibit IOFC projections, we infused a viral vector-expressing halorhodopsin that promotes an inhibitory Cl<sup>-</sup> channel, in IOFC. After viral expression, we used optic fibers to deliver laser light, and thus silence IOFC terminals in prelimbic cortex (PL), nucleus accumbens (NAc), or basolateral amygdala (BLA). Results: Our preliminary results show that inactivation of only IOFC projections to PL induced persistent avoidance after Ext-RP, suggesting that this projection facilitates the transfer of extinction to avoidance. Conclusion: Therefore, under normal conditions, hypoactivity of IOFC projections to PL (or vPFC to rACC in humans) would lead to excessive avoidance behaviors as observed in OCD and PTSD patients. Acknowledgements: This work was supported by NIMH P50 MH086400 and R37 MH058883 to GJQ.

**2083 Novel 1,5-Disubstituted 1,2,3-Triazoles as Inhibitors of Metastatic Breast Cancer**

*Tatiana M Matos Gascot<sup>1</sup>, Gretchen G Gutierrez Santana<sup>2</sup>, Zulma Ramos<sup>1</sup>, Eliud Hernández<sup>1</sup>, Cornelis P Vlaar<sup>1</sup>*

<sup>1</sup>School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>College of Natural Science, University of Puerto Rico Rio Piedras Campus, PR

**Background & Objectives:** There is a critical need to develop novel therapeutics that halt cancer metastasis. The Rho family GTPases that regulate cell invasion and migration are an excellent target for anti-metastatic cancer therapy. Previously we reported the development of the 1,5-disubstituted 1,2,3-triazole compound MBQ-167 which inhibits the GTPases Rac and Cdc42 and was shown to inhibit *in vivo* tumor growth in a xenograft mouse model. **Objectives:** The aim of the current study is to design and synthesize novel derivatives of MBQ-167 in order to obtain compounds with enhanced activity. **Methods:** The 1,5-disubstituted triazoles were synthesized via cycloaddition of azides and alkynes using the ruthenium catalyzed, for aliphatic alkynes, and the Grignard reagent, for the aromatic alkynes.

The new compounds were analyzed for cytotoxicity to MDA-MB-231 breast cancer cell line via a Sulforhodamine B assay. Inhibition of cell migration was analyzed through a Scratch Assay Protocol. Results: Several derivatives of MBQ-167 were synthesized with the Grignard reagent giving good yields. The new compound TMG-065 was the one with the highest yield and showed an 68% of growth inhibition *in vitro* at 25µM concentration. Other new compounds, TMG-041-42 was synthesized via ruthenium catalyzed but the yield and the percentage of growth inhibition were very low. **Conclusions:** The Grignard reagent for our substrates provides better yield of products than the ruthenium catalysis, other reaction conditions are under investigation. The new compound TMG-065 appear very active similar to his precursor MBQ-167. **Acknowledgements:** This research was supported by 1 SC3 GM116713-01 to CPV.

**2104 Encouraging parents to read aloud to babies in NICU as a resource to promote early literacy**

*Krystal Miranda Aponte, MD<sup>1</sup>; Desirée García Álvarez, MD<sup>1</sup>; Inés García García, MD<sup>2</sup>; Lourdes García Fragoso, MD<sup>2</sup>; Kary Bouet Rivera, MD<sup>2</sup>; Lourdes García Tormos, MS SLP<sup>2</sup>*

<sup>1</sup>Department of Pediatrics, <sup>2</sup>Neonatology section, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

**Background & Objectives:** Studies had shown that there are millions of words of difference between children who have been read to in early infancy and childhood and those who are not exposed to reading. Neurologically, infancy is a critical period because cortical development is influenced by the amount of central nervous system activity stimulated by experience. Interventions encouraging parents to read to their infant in the NICU has been found to have a positive effect in parents, infants and on parent-infant relationships. The objective of this study is to determine if the implementation of a program to encourage parents to read aloud to babies promote its continuation after discharge from NICU. To our best knowledge this is the first study in Puerto Rico addressing early reading in NICU. **Methods:** Phase 1 is a descriptive analysis consisting of an anonymous survey administered to parents of children less than 3 y/o attending HoPU High Risk Clinics. Phase 2 is a interventional study consisting of an initial survey, implementation of reading program at HOPU NICU (videos and focal groups) and a follow up survey 6 months later. **Results:** 204 parents participated in phase 1, 72 completed initial survey and 18 completed intervention and follow up on phase 2. Based on chi square analysis, mothers with post-high school education were more likely to read to their children than those with high school or less education (70% vs. 53%; OR 2.05 [1.12-3.77] p = 0.0190). The prevalence of reading to children at home was 74% vs 26% while admitted to NICU (OR 6.81[3.01-15.4] p=0.0000). 94% of parents reported reading to their children

after being discharged from NICU vs 36% before intervention (OR 30.1 [3.78-239.16]  $p=0.0000$ ). Conclusion: We conclude that implementation of early literacy programs in NICU promotes its continuation after being discharged home. Mothers with higher education are more likely to read to their children. We propose promotion of reading during the first years of life as an easy and cost-effective way to improve early literacy in the low income families. Project was approved by the IRB. Protocol number: 0420416.

**2116 Síntomas de Depresión y el Control de los Niveles de Glucosa en Sangre en Adultos con Diabetes Mellitus Tipo 2 en Puerto Rico**

*Glorivett De Jesús Rullán, RN, MSN; Neida Borrero Rodríguez, RN, MSN; Nancy Dávila Ortiz, RN, PhD*  
Escuela de Enfermería, Universidad de Puerto Rico  
Recinto de Ciencias Médicas, San Juan, PR

Antecedentes y Objetivos: La Diabetes Mellitus Tipo 2 (DM2) es una enfermedad crónica con alta prevalencia a nivel global, incluyendo a Puerto Rico (PR). La DM2 está asociada a problemas de salud, como la depresión. El riesgo de depresión está influenciado por el reto de modificar conductas y desarrollar un automanejo apropiado de la condición y se presenta con mayor frecuencia que en la población general. El objetivo de este estudio fue determinar la presencia de síntomas de depresión y explorar la relación con el control de los niveles de glucosa en sangre en una muestra de adultos con DM2 en PR. Método: Diseño descriptivo correlacional y una muestra de 60 participantes reclutados en el *Center for Diabetes Control Corp.* Se aplicó un instrumento de características demográficas/salud, y el PHQ9. Resultados: La media de edad fue 68.6 años, el 53.3% de la muestra eran hombres y el 28.3% indicó haber sido diagnosticado con depresión. Los 9 síntomas de depresión incluidos en el PHQ-9 estuvieron presentes en el 100% de la muestra; el 83.3% tenía síntomas de depresión mínima, 11.7% cumplía con los criterios de depresión moderada y el 5.0% se encontraba en la categoría de depresión moderada-severa. La media de la hemoglobina glucosilada (A1c) fue 7.3%. Los datos recopilados no reflejaron asociación estadísticamente significativa entre los síntomas de depresión y los niveles de glucosa en sangre. Conclusión: Los síntomas de depresión presentes en la totalidad de la muestra es un hallazgo relevante. La depresión puede tener un efecto importante sobre el control glucémico, el automanejo de la diabetes y la calidad de vida en los pacientes con DM2 que la padecen. La identificación e implementación de alternativas que aporten a la solución del problema de la depresión es de vital importancia para obtener mejores resultados en los pacientes.

**2119 Consumo de bebidas azucaradas en el Recinto de Río Piedras luego de puesta en vigor la Certificación #35**  
*Natalie M Maldonado García*

Programa de Internado en Dietética, Escuela de Profesiones de la Salud, Universidad de Puerto Rico Recinto de Ciencias Médicas, San Juan, PR

Trasfondo: La Universidad de Puerto Rico se ha integrado al Movimiento Internacional de Universidades Promotoras de la Salud, en el cual se busca que la comunidad universitaria se beneficie de un ambiente que fomente hábitos alimentarios saludable. Se logra mediante la implantación de políticas institucionales, amoldadas a las necesidades de su población. También, ha unido esfuerzos con la Comisión de Alimentación y Nutrición de Puerto Rico y la Organización Mundial de la Salud en la búsqueda de contrarrestar las tasas elevadas de sobrepeso y obesidad en la isla. En una muestra del proyecto Perfil de Salud con estudiantes de nuevo ingreso del Recinto de Río Piedras el 34% está en sobrepeso u obesidad. Objetivo: El propósito de esta investigación, es estudiar cómo la certificación # 35, medida que prohíbe la venta de agua embotellada en el Recinto de Río Piedras, ha influenciado el consumo de bebidas azucaradas. Metodología: El impacto se analizará a través de un estudio retrospectivo, utilizando el registro de ventas de los concesionarios de alimentos y de las máquinas expendedoras, fuera y dentro del recinto universitario. Resultados: En los datos preliminares se identificó que el consumo de refrescos carbonatados y bebidas con electrolitos han aumentado un 15% y 63 %, respectivamente. Conclusión: A partir de estos datos, se demuestra que la prohibición de la venta de agua embotellada redirige una posible conducta saludable, hacia el consumo de bebidas azucaradas, el cual esta siendo estudiado como un factor predisponente en la prevalencia de sobrepeso y obesidad. Reconocimiento: Se agrade a las profesoras del Programa de Nutrición y Dietética, la Dra. Elsa Pinto y la Dra. Brenda Toro, por su mentoría.

**2126 The role of Cathepsin B secretion of HIV-infected MDM on neuronal apoptosis**

*Camille Zenón, Loyda M Meléndez*

Department of Microbiology and Medical Zoology,  
University of Puerto Rico Medical Sciences Campus,  
San Juan, PR

Background & Objectives: Human immunodeficiency virus 1 (HIV-1) infection can induce HIV-associated neurocognitive disorders (HAND) (Gannon et al., 2011; Saylor et al. 2016) as it targets CD4+T lymphocytes, monocytes, macrophages and microglia. Monocytes act as one of the HIV viral reservoirs that cross the blood-brain barrier (BBB) to the Central Nervous System (CNS) facilitating viral spread, inflammation, and neuronal damage. HIV-1 infected macrophages secrete inflammatory factors and viral proteins that affect neurons. Cathepsin B (CATB) is a lysosomal cysteine protease that plays an important role in neurodegeneration (Nixon et al., 2000) and apoptosis (Kingham & Pocock 2001). Our laboratory demonstrated that CATB is one of these secreted factors from HIV-infected

macrophages that affects neurons and induces apoptosis (Rodríguez-Franco et al.2012). However, its secretion is variable among different donors. Our hypothesis is that HIV infection in donors with higher levels of CATB increase neuronal apoptosis compared to donors that do not increase CATB secretion. Methods: Monocyte-derived macrophages (MDM) were inoculated with HIV-1 ADA and cultured for 13 days. HIV-p24 and CATB concentration were measured from the MDM supernatants by ELISA (n=6). Serum-free supernatants from HIV-infected treated MDM and negative controls were added to HTB-11 neuronal cells at 13 days post-infection (dpi) and apoptosis measured by TUNEL. Results: We found that HIV infection was productive in all 6 donors. In 3 of the donors there was an increase of CATB while the other 3 decreased CATB. Conclusions: Preliminary results indicate that an increase on CATB secretion in MDM HIV-infected induces greater neuronal apoptosis when compared with MDM HIV-infected that decrease CATB secretion. Our long-term goal is better understand the role of CATB in promoting HAND to test the neuronal apoptosis prevention strategies in order to prevent HAND. Acknowledgements: This research was sponsored by SC1GM113691 and NIMH U54MD007600.

**2134 An Association between Alzheimer's Disease and Depressive-Affective Disorders in a Hispanic Population**

*Ginette González Ramírez<sup>3</sup>, Nathalie Rivera<sup>1</sup>, Mariela M Rivera Agosto, MD<sup>1</sup>; Jorge Acevedo Canabal, MD<sup>1</sup>; Alexandra Rivera<sup>1</sup>, María Rodríguez<sup>1</sup>, Arturo Pérez<sup>3</sup>, José Nieves<sup>1</sup>, Aleyda Maldonado, PhD<sup>1</sup>; Ivonne Z Jiménez Velázquez, MD<sup>2</sup>*

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Department of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>University of Puerto Rico, Río Piedras Campus, PR

Background: A history of Depressive-Affective Disorders (DAD) has been demonstrated to increase the risk of developing Alzheimer's Disease (AD). Studies have shown an increased prevalence of DAD in Latino subgroups in the U.S. However, an association between DAD and AD has not been previously reported in our Puerto Rico study population. This study aims to evaluate the presence of this association in our study sample in order to identify potentially useful interventions. Methods: From 2002 to 2016, a sample of 206 participants from Puerto Rico who were under 65 years of age and had family history of AD were evaluated for dementia. Examination consisted of a focused clinical evaluation that included the Short Blessed Test (SBT). Reported DAD diagnosis was obtained from history of present illness, and AD had been previously diagnosed by a Primary Care Physician (PCP). The SBT was used to assess cognitive changes.

A score of 10+ was considered to be positive and consistent with dementia. Results: Among 206 participants, 58 (28%) scored 10+ on the SBT. Of these 58 participants, 22 (38%) had history of DAD. From those 22 participants, six had concomitant AD and DAD and 16 had only DAD. Moreover, 24 patients (41%) with a positive SBT had neither a diagnosis of AD nor DAD. Conclusions: Since a positive SBT suggests impairment consistent with dementia, further examination of these participants by a PCP should be performed. Although supplementary studies are needed, we identified an association between DAD and a positive SBT. Therefore, patients with a positive SBT and history of DAD should be evaluated for AD. We suggest that efforts should be made to recognize and diagnose AD formerly in patients whose initial presentation consists of symptoms such as: depression, anxiety and agitation. For future studies, treatment of DAD with antidepressants should be evaluated.

**2139 Entomological Sampling of Mosquitoes in an Arbovirus Endemic Area**

*Harry G Ramírez<sup>1</sup>, Robert Rodríguez<sup>2</sup>, Vivian S Green<sup>2</sup>, Juan C Orengo<sup>2</sup>, Adelfa E Serrano<sup>3</sup>, Emilee E Colón Lorenzo<sup>4</sup>*

<sup>1</sup>Department of Natural Sciences, University of Puerto Rico, Río Piedras Campus, PR; <sup>2</sup>Ponce Health Sciences University, Public Health Program, Ponce, PR; <sup>3</sup>Department of Microbiology and Medical Zoology, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>4</sup>Deanship of Academic Affairs, Center for Collaborative Research in Minority Health and Health Disparities, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Mosquito-borne diseases cause the death of over one million people worldwide. *Aedes aegypti* mosquitoes are endemic in Puerto Rico and are responsible for transmitting dengue, chikungunya, and Zika virus. A major challenge to control these diseases relies on controlling the vector. Our aim is to assess the prevalence of mosquitoes and further screen for the presence of the virus. Methods: Mosquitoes were collected during 8 months using human lured BG-Sentinel 2 traps. Environmental variables as temperature, humidity, pressure, and precipitation were recorded for each sampling day. Mosquitoes were identified using morphological characteristic keys and classified by genus, sex, and species. All mosquitoes were georeferenced and the collections were conducted in two sampling points located at San Juan, Puerto Rico. Results: A total of 21 collections were done and the mosquitoes captured comprises of 79.1% *Aedes spp.*, 20.1% *Culex spp.*, 0.7% *Anopheles spp.* and 0.1% *Psorophora spp.* Our data collected from both Non-Hurricane Season and Hurricane Season, including post hurricanes Irma and María, revealed a significant increase (p<0.05) du-



ring the Hurricane Season in the total population of *Aedes aegypti* mosquitoes and an increase in females *Aedes aegypti*. Additionally, a statistically significant increase ( $p < 0.05$ ) in the temperature at the collection sites was detected. Conclusion: This study shows that the *Aedes aegypti* mosquitoes are abundant, and the mosquito population increases during the Hurricane Season. Our results show that integrating mosquito sampling and environmental data provide a better understanding of mosquito presence. Monitoring the mosquito abundance and prevalence will provide an association between mosquito-borne diseases incidences and the effectiveness of the control measures. Establishing a well-distributed monitoring system will provide significant data to help mosquito surveillance and control, as well as potential prediction of epidemics. Acknowledgements: This research was supported by the NIMHD-RCMI 8G12MD007600 and US4MD007600 Pilot Project Grants.

**2153 Synthesis of 3,6-dibromocarbazole and 5-bromoindole derivatives as anti-cancer and anti-migration agents in MDA-MB-231 cancer cells**

*Krystal M Butler, Zulma Ramos, Eliud Hernández*  
School of Pharmacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: In women, breast cancer is one of the leading causes of death, due to metastasis. N-WASP protein is involved in invadopodia formation in metastatic carcinoma cells. A 3,6-dibromocarbazole derivative named wiskostatin has been identified as a N-WASP inhibitor. Unfortunately, in a recent study was found that wiskostatin inhibited other cellular functions that are not believed to be N-WASP dependent. We hypothesize that compounds that contain in their structure a hydrophobic aromatic group with an elongated aliphatic polar segment will potentiate the ability of the molecule to interact with N-WASP. The aim is to synthesize compounds derived from 3,6-dibromocarbazole and 5-bromoindole to evaluate their cytotoxic and anti-migration activity in vitro on MDA-MB-231 cell line. Methods: All compounds were synthesized reacting 3,6-dibromocarbazole or 5-bromoindole derivatives with ethyl 4-bromobutyrate via substitution reaction followed by hydrolysis. The carboxylic acid product, was reacted with representative amines to obtain carbazole or indole amide derivatives. All compounds were analyzed for their cytotoxic and anti-migration activity in MDA-MB-231 cell lines using Sulphorhodamine B assay and wound-healing assay, respectively. Results: Among the twenty one compounds synthesized as derivatives of dibromocarbazole or indole, seven compounds showed growth inhibition with GI50 in the range of 4.7 to 23  $\mu\text{M}$ . One compound demonstrates anti-migration activity with 46% inhibition of wound closure at 10  $\mu\text{M}$ . Conclusion: From our results, we can conclude that dibromocarbazole derivatives

can be used for the development of possible new antitumor therapeutic agents. Acknowledgements: The project was supported by NIGMS NIH 1SC2GM116712-01A1.

**2164 Mental Health Providers that integrate Evidence-Based Practices for Anxiety Disorders in Puerto Rico**

*K Martinez, A Subervi, M Rodriguez, S Garcia, C Fernández, N Suria Cordero, J Alvarado Chittenden*  
University of Puerto Rico Medical Sciences Campus, San Juan, PR

Objectives: The number of mental healthcare providers that integrate evidence-based practice (EBP) when treating patients with Anxiety Disorders in Puerto Rico is unknown. This greatly limits accessibility to providers who offer up-to-date mental healthcare, and to quality treatment of Anxiety Disorders. Methods: In order to address this gap, the study aims to contact 250 mental health providers (MHP) currently treating patients with Anxiety Disorders in Puerto Rico. Providers will be recruited purposefully through a non-probabilistic snowball sampling method by referral from a prospective participant list of 10 mental health providers. A telephone screening will be used as a method for evaluating and determining the degree to which MHP apply EBPs for anxiety disorders, the populations they serve, the cost of sessions with and without health insurance, and the locations where services are provided. Results: We expect to complete 250 telephone calls to identify MHP who provide EBPs as well as to assess the needs for EBP implementation in MHP. Our aim is to create a network of professionals that treat patients with anxiety disorders. A reliable referral list of MHPs will be made by municipality to eventually disseminate to the population. Conclusions: Ultimately, a training workshop of evidence-based practices will be offered to those who choose to participate. In the future, this may introduce novel mental health care policies to further address barriers to the access of quality mental health services. Acknowledgments: R25MD007607

**2166 Use of Mathematical Non-linear Growth Functions to Model Plasmodium berghei Parasitemias**

*Emilee E Colón Lorenzo<sup>1</sup>, José R Muñiz González<sup>2</sup>, Adelfa E Serrano<sup>1</sup>, Ricardo R González Méndez<sup>3</sup>*

<sup>1</sup>Department of Microbiology and Medical Zoology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Biology Department, University of Puerto Rico, Río Piedras Campus, PR; <sup>3</sup>Department of Radiological Sciences, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background & Objectives: Malaria is an infectious disease caused by *Plasmodium* parasites. The growth and development of *Plasmodium* parasites are monitored by measurements of parasitemia. The parasitemia (percent of infected erythrocytes)

is calculated by determining the amount of infected red blood cells (RBCs) in a total of 500 RBCs. The parasitemia curves are non-linear sigmoid shaped curves showing growth delays. Analyses are performed using linear regression by plotting the percent parasitemia in the Y-axis and time (in days) in the X-axis. Due to the non-linearities, the curves are analyzed in sections. The aim is to evaluate the growth of *Plasmodium* parasites using mathematical growth function models and comparing them with the segmental linear regression approach. Previously our lab generated *Plasmodium berghei* mutant parasites for the following genes: gamma-glutamyl cysteine synthetase (*pbggcs-ko*), glutathione reductase (*pbgr-ko*), and multidrug resistance-associated protein (*pbmrp-ko*). The growth of these mutant parasites was analyzed. Methods: Parasitemia datasets were previously generated by microscopic examination of Diff-Quick stained thin tail blood smears. The percentage of parasitemia was determined during 10 consecutive days. The data was modeled by mathematical growth functions using non-linear line-fitting with the GraphPad Prism software. Six non-linear growth functions were evaluated: Weibull, Gompertz, Logistic, Exponential, Exponential plateau, and a Beta equation. Results: Based on the goodness of fit criteria, our results show that the Weibull function provides flexible curve fitting and is an excellent model for automated and objective analysis of growth patterns in *Plasmodium berghei* parasites and all the mutants studied. The curve parameters have simple biological interpretation. Conclusion: This study demonstrated that the Weibull growth model is a practical and reliable method to present the *Plasmodium* parasitemia data in a more accurate and mathematically objective form with simple biological interpretation. Acknowledgements: This research was partially supported by the NIMHHD grants 8G12MD007600 and US4MD007600.

**2167 Presenilin- 2 Gene Mutation Identified in Seven Hispanic Patients Presenting with Fronto-Temporal Dementia-like Phenotype**

*Nathalie Rivera, Ginette González Ramírez, Alexandra Rivera, María Rodríguez, Arturo Pérez, José Nieves, Jorge Acevedo Canabal, MD; Mariela M Rivera Agosto, MD; Aleyda Maldonado, PhD; Ivonne Z Jiménez Velázquez, MD*

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>University of Puerto Rico, Rio Piedras Campus, PR; <sup>3</sup>Department of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background: Presenilin-2 (PSEN-2) mutation has been associated with familial Alzheimer's Disease (AD), early age at onset and non-cognitive neurological symptoms. Seven patients in Puerto Rico have been identified with the presence of PSEN-2 mutation and diagnosed with AD. Moreover, these

seven patients present atypical symptoms such as behavioral and affective changes, which are characteristic of Frontotemporal Dementia (FTD), rather than the cognitive deficit presentation of typical AD. Methods: From a sample of 126 participants with familial AD, 7 showed PSEN-2 gene mutations. History of illness and disease progression of each patient was analyzed to identify common symptoms associated with PSEN mutations such as behavioral changes, psychiatric symptoms and memory loss. Results: Participants consisted of six females and one male. Initial symptoms presented between 48-56 years of age, while six out of seven patients had a clinical diagnosis of AD between ages 51-57 years old. In six out of seven patients, initial symptoms included changes in behavior and personality followed by memory deficits as disease progressed. Four out of seven patients were diagnosed with depressive/affective disorder and three patients had visual hallucinations. Three patients had previous brain imaging studies in which two of them presented frontal lobe atrophy. All patients had a rapid progression leading to early incapacity. Conclusions: We describe the clinical presentation of a PSEN-2 mutation in seven Puerto Rican participants. Coupled with recent literature, this report suggests that PSEN-2 mutations can present with a mixed AD and FTD clinical criteria, with behavioral changes and psychiatric symptoms being the earliest signs. These findings can guide physicians to recognize that patients with the aforementioned symptoms may have an underlying PSEN-2 mutation and may need further evaluation of their blood relatives. We believe these results can raise awareness for future studies on PSEN mutations in the Puerto Rican population.

**2176 Cross Cultural Adaptation of a Questionnaire to Assess Post-Partum Pain Management Satisfaction Upon Hospital Discharge**

*D Vargas Maldonado<sup>1</sup>, P Silén Rivera<sup>1</sup>, J Medina Zayas<sup>2</sup>, K Pietri Mattei<sup>1</sup>*

<sup>1</sup>School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan PR; <sup>2</sup>University Hospital of Carolina, PR

Background & Objectives: Adequately managing of pain after a hospital discharge is a challenging skill for any physician. This is truth due to the individual characteristics of each pain, perception of pain and extensive medications available for analgesia. Currently there is no guidelines that describe the optimal treatment for pain in post-partum period. This study aimed to evaluate the effectiveness of NSAIDS drugs in the post-partum period as a single agent for pain management as well as to address the importance of limiting the use of opioids narcotics during the post-partum period due to the risk associated with its use as a chronic pain reliever. Methods: The first stage in this study consisted in validation of a questionnaire on post-partum pain management satisfaction in the Puerto Rican population. We conduct a focus study in 10 women be-

tween 21 years or older who underwent a vaginal or cesarean delivery in the University District Hospital. Patient will be selected during post-partum visit at clinics. Exclusion criteria are women less than 21 years old, allergies to NSAIDs or contraindication for usage. A questionnaire was created from previously validated questionnaires on pain management from Spanish Association of Pain, International Pelvic Pain Association and American Pain Society. Subject participation will require assessment of content clarity and internal consistency. Recommendation made by each participant were taken into consideration to create a new instrument which can serve as an assessment tool for post-partum pain. Results: Five questions were changed. Content validity was achieved after being adjusted for improved understanding in our cultural context. Conclusion: Minor changes were performed in the data collecting tool which had proven to be a valid and reliable method to evaluate pain management offer in our institution. This ongoing study can provide a change in the opioid-centric prescribing practices with targeting pain control using NSAIDs as a single agent. Acknowledgments: none.

**2179 How does the learning environment influence the behavior of residents?**

*Jennifer Claudio Malavé, MD; Josie Fuentes Gutiérrez, MD; Debora H Silva, MD, FAAP, M Ed*  
Department of Pediatrics, University of Puerto Rico Medical Sciences Campus, San Juan PR

Background & Objectives. The clinical learning environment plays a critical role in shaping the professional behavior of medical students and residents. In our school in specific, negative behaviors have been reported by medical students from residents. This is worrisome as residents' behavior is essential for shaping medical students into future physicians. Thus, our objective is to evaluate if residents have been exposed to incidents of unprofessional behavior and/or mistreatment and how these incidents have influenced their behavior. Methods: This was a qualitative and quantitative IRB approved research. Residents from the 19 residency programs of the UPR-SOM were invited complete an anonymous questionnaire. Chief residents from these programs were invited to participate in focus groups. Both questionnaire and focus groups asked about mistreatment experiences during medical school and residency. Results: A total of 9 chief residents participated in focus groups. Thematic analysis indicated residents believe the definition of mistreatment is subjective, it is done unconsciously and more commonly experienced by lower level residents. Forty three percent of residents answered the questionnaire. Reported incidents of mistreatments, both in medical school and residency, were high for public humiliation (25% vs. 30%), request to perform personal favors (29% vs 11%), and exposition to sexist remarks (24% vs. 13%). Only 7% of residents reported they mistreated others. No statistically significant difference was found in the

report of mistreatment between surgical and clinical training programs. Finally, around 21% of residents reported inadequate professionalism orientation in their residency programs. Conclusion: Despite our school zero tolerance policies, unprofessional behaviors and mistreatment were equally reported in both clinical and surgical groups. It appears that residents do not have insight on how some of their behaviors constitute mistreatment. Residency programs should give more importance to professionalism orientation and expected professional behaviors. Acknowledgment: Dra. Irma Rivera for aid in statistical analysis. Approved by the IRB, Protocol 1170117

**2199 Proteomics and Metabolomics of the sensor Mtl1p in *Saccharomyces cerevisiae* as an aid in stress-specific functional role determination**

*Nelson Martinez Matias<sup>1</sup>, Ednalise Santiago Cartagena<sup>1</sup>, Nataliya Chorna<sup>1</sup>, Jose Rodriguez Medina<sup>1</sup>*  
<sup>1</sup>Department of Biochemistry, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Background and Objectives – Mtl1p is a member of the Cell Wall Integrity (CWI) Pathway in *Saccharomyces cerevisiae* and a putative sensor of H<sub>2</sub>O<sub>2</sub>-induced stress. To identify additional roles for Mtl1p we have investigated proteins that interact physically with Mtl1p. Six interactors were assessed for importance in growth fitness on exposure to H<sub>2</sub>O<sub>2</sub> and to the antifungal Caspofungin, and for their role in activating the CWI Pathway. To further inquire roles for Mtl1p we have investigated the metabolomes of an *mtl1Δ* and a *WT* strain. Methods – Physical interactors of Mtl1p were identified by yeast two-hybrid (MYTH) assays. Growth fitness was assessed with growth assays in liquid CSM for deletion mutants of the interactors on exposure to either 1 mM H<sub>2</sub>O<sub>2</sub> or 10ng/ml Caspofungin at 27°C. Activation of the CWI Pathway was assessed using the phosphorylation status of Slt2p as activation criteria, as determined by western blots. The metabolomes of the tested strains were obtained by GC/MS analyses of cell homogenates. Results – Fifteen proteins interacted with Mtl1p in MYTH assays. The *ras2Δ* strain shows susceptibility to H<sub>2</sub>O<sub>2</sub> while the *zeo1Δ* strain shows susceptibility to Caspofungin, both compared to the *WT* strain. The *ras2Δ* strain shows a highly diminished activation of the CWI Pathway when exposed to 1 mM H<sub>2</sub>O<sub>2</sub>. Twelve metabolites were found to have different abundances in the *mtl1Δ* and *WT* strains. Conclusions – Ras2p and Zeo1p are important for growth fitness, the first on exposure to H<sub>2</sub>O<sub>2</sub> and the second on exposure to Caspofungin. For the former, the lack of fitness of its deletion strain correlates with a highly diminished activation of the CWI Pathway while for the later there is no correlation. As found by PCA the metabolomes of a *WT* and an *mtl1Δ* strain are different. Acknowledgments – This research is supported by grants NIMHD-G12MD007600, NIGMS-RISE-R25GM061838 and NIGMS-INBRE-5P20GM103475.

**2215 Contraceptive use among Hispanic Women living in San Juan Puerto Rico**

*Jeidiel De León Arbucias<sup>1</sup>, Jorge Acevedo Canabal<sup>2</sup>, Manuel de la Garza Casillas<sup>3</sup>, Yaredis Emmanuelli Aquino<sup>4</sup>, Erika Benabe Gonzalez<sup>1</sup>, Josefina Romaguera Agrait<sup>2</sup>*

<sup>1</sup>Obstetrics & Gynecology Department, San Juan City Hospital, San Juan, PR; <sup>2</sup>Obstetrics & Gynecology Department, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>3</sup>Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>4</sup>University of Puerto Rico, Río Piedras Campus, PR

**Background & Objectives:** Increasing lack of contraceptive knowledge and practices among Hispanic women, combined with the Zika virus epidemic, resulted in Puerto Rican women being at a higher risk of infection, transmission, and subsequent birth defects from Zika virus. Puerto Rico has a 65% of pregnancies that are unintended and the majority of which are women aged 29 years or less; putting them at greater risk of engaging in high risk sexual behaviors than Hispanics in the US. Reports indicate that a great percentage of these women are not utilizing the most effective contraceptive methods, due to contraceptive availability being reduced by economic, medical and social barriers. Given the high rate of unintended pregnancies and transmissible infections, data on contraceptive use among the population is of utmost importance when creating public health initiatives. This study sought to access which specific contraceptive methods are being employed by sexually active women. **Methods:** Self-administered questionnaires, from October 2016 to February 2018, with a total sample of 508 women above age 21 visiting San Juan City Hospital, University District Hospital and community. **Results:** When participants were inquired about contraceptive use, 402 (89.93%) reported using at least 1 form of contraceptive method. From those who reported the use of contraceptive methods: 244 (49.09%) answered oral contraceptive pill (OCP), 299 (61.15%) male condoms, 89 (34.10%) rhythm, 81 (31.15%) female sterilization, 97 (20.21%) withdrawal, 92 (19.49%) Implanon, 65 (13.49%) Depo Provera, 41 (8.47%) female condoms, 13 (5.18%) male sterilization, 19 (3.95%) transdermal patch, 15 (3.12%) Paragard IUD, 14 (2.89%) vaginal hormonal ring, and 10 (2.09%) Mirena IUD. **Conclusion:** Public health interventions should be developed to increase knowledge about sexual health, promote safe sexual practices, educate on contraceptive method effectiveness, prevention of sexually transmitted diseases, and to reduce the barriers that prevent acquisition of effective contraceptive methods. **Acknowledgements:** None.

**2219 Knowledge about contraceptive methods among Hispanic Women living in Puerto Rico**

*Jorge Acevedo Canabal<sup>1</sup>, Jeidiel De León Arbucias<sup>2</sup>, Frances Morales Ramos<sup>3</sup>, Gabriela Roldan Cordero<sup>4</sup>, Erika Benabe Gonzalez<sup>2</sup>, Josefina Romaguera Agrait<sup>1</sup>*

<sup>1</sup>Obstetrics & Gynecology Department, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>2</sup>Obstetrics & Gynecology Department, San Juan City Hospital, San Juan, PR; <sup>3</sup>Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR; <sup>4</sup>University of Puerto Rico, Cayey Campus, San Juan, PR

**Objectives:** In Puerto Rico, up to 65% of all pregnancies have been reported to be unintended, the majority occurring in women younger than 30 years of age. The level of knowledge about contraceptive methods has been shown to affect patients' use of contraception and the effective use of their method of choice. The aim of this study is to evaluate the knowledge and attitudes about contraception among Hispanic women living in Puerto Rico. **Methods:** Between October 2016 and February 2018, women at the Obstetrics & Gynecology clinics of the San Juan City Hospital and neighboring community were offered to participate in a cross-sectional survey study consisting of a self-administered questionnaire. The instrument used inquired about demographic information, sexual and reproductive history, and knowledge about contraceptive methods. To participate, women needed to be 21 years of age or older and provide written consent. **Results:** A sample of 289 women participated in the study. In our study group 94.1% of participants reported having received information about contraception during their lifetime. The most commonly reported source of information about contraception were physicians (85.3%), followed by friends or relatives (22.4%), and internet or television (17.6%). Just over half (54.9%) of participants believed oral contraceptive pills (OCPs) were more effective than male condoms. Eighty five percent (85.3%) reported that condoms were effective in the prevention of sexually transmitted infections. Thirty five percent (34.7%) identified intrauterine devices as more effective than OCPs. **Conclusion:** Our findings show that there are concerning knowledge gaps in our population could be the focus of physician counselling and future educational campaigns. Further studies to identify population in need of information and interventions to increase level of contraceptive knowledge are needed.

## Abstracts that reported IRB protocol number

SID	Title	SID	Title
1671	Psycho-Social Survey: Comparison of Permanent Pacemaker Impact Through a 15-year Interval	1820	Reduced health disparities in dental preventive services among 12-year-old Puerto Ricans
1675	Aplicación de la Teoría de Acción Razonada a la Intención/Acción de Hacerse la Mamografía en Mujeres No Adherentes Mayores de 40 Años en Puerto Rico	1835	Evaluation of the Dissemination and Implementation of a National Colorectal Cancer Screening Program among Primary Care Physicians in Puerto Rico
1693	Exploring the Well-being of Resident Physicians at a Hispanic Academic Medical Center, 2015-2016.	1839	The Use of Oral Hypoglycemic Agents in the Management of Diabetes Mellitus During Pregnancy
1705	SBAR Method For Improvement Of Transmission of Information In The University Pediatric Hospital: A Quality Improvement Project	1846	Uso de suplementos herbarios en adultos en el área noreste de Puerto Rico y su potencial de interacción
1710	Clinical and Demographic Profile of Patients Receiving Benzodiazepines for the Treatment of Anxiety Disorders at a Specialized Center in Puerto Rico	1851	Adenosine A1-Dopamine D1 Receptor Heteromers Control the Excitability of the Spinal Motoneuron
1715	Assessing Cancer Driving CCR4 Mutations in Cutaneous T-Cell Lymphomas	1853	Expression of antioxidant genes and drug sensitivity profile of Plasmodium berghei abcg mutant
1734	Novel Damaging IRF6 Mutation in a Van der Woude Family from Puerto Rico	1856	Anogenital Findings of Child Sexual Abuse in Puerto Rican Children: Revisited
1739	Dendritic Cells Apoptosis and Pro Inflammatory Cytokines Reduction Driven by Fh12 Protein in the Presence of Bacterial Components	1862	Identifying Opioid and Benzodiazepine Withdrawal in Trauma Intensive Care Unit (TICU) Patients
1745	Experience of HIV Adolescents Compared with Sickle Cell and Inflammatory Bowel Disease Adolescents Regarding Transition to Adult Care in Puerto Rico	1874	Pharmacists' Impact on Preventable Hospital Readmission Rates of High Risk Patients by offering Transition of Care Services upon Discharge
1746	Making Assistive Technology Accessible for Community-Living older Hispanics with Functional Limitations: A Feasibility Study	1880	Uso de Simulación Clínica para Desarrollar Autoconfianza y Pensamiento Crítico en Estudiantes Subgraduados de Enfermería Psiquiátrica/Salud Mental
1754	El Síndrome de Quemazón y su relación con la violencia de los pte. percibida por el personal de enfermería que trabaja en un hospital psiquiátrico.	1896	Experiencias de adultos entre 40 y 60 años viviendo con DT2
1770	The Occurrence of Delirium in Cardiovascular Surgical Patients	1897	Manifestaciones de TV y el SQ en enfermeras que trabajan con mujeres sobrevivientes de VD en salas de emergencias de PR
1777	Assessing the Interest, Knowledge and Confidence of Third Year Dental Medicine Students in the Management of Deaf Patients in the Dental Practice	1907	Quality Improvement Project - Needs Assessment of Accurate Asthma Exacerbation Management in the Emergency Room at the University Pediatric Hospital
1794	Orthopedic Surgery Residency Case Log Transition: An Analysis of ACGME Data	1913	Level of Satisfaction and Perception of Patients that Benefit from a Comprehensive Evaluation of Medications by Pharmacists in Ambulatory Clinics
1798	Estimado del Dolor en Pacientes Sedados en Ventilador Mecánico	1914	Acceptability, barriers, and facilitators of a preventive group intervention for self-management of functional disabilities among older Hispanics.
1807	The Use of Metabolomics in the Study of Mild Hypospadias	1919	Knowledge and Practice of Pertussis Vaccination during Pregnancy by Mothers of Infants Admitted to the Neonatal Intensive Care Unit
1809	Clinical Profile and Psychiatry Comorbidities of patients with Obsessive –Compulsive Disorder treated at CETMA in Puerto Rico	1938	Transition Readiness (TR) from Pediatric to Adult-Oriented Care Among Young Adults with Type 1 Diabetes Mellitus (T1DM) in Puerto Rico (PR)
1816	Estilos de Aprender de Estudiantes de Bachillerato en Ciencias de Enfermería y Preferencias por Prácticas de Enseñanza	1941	Las experiencias de violencia vertical de los estudiantes de enfermería en la práctica clínica

SID	Title	SID	Title
1951	Control ejecutivo en medidas de fluidez verbal en una muestra de mujeres puertorriqueñas VIH seropositivas (VIH+)	2070	Andrographolide Induces a DNA Damage Response in Prostate Cancer via DNA Double Strand Breaks
1959	Calculus prevalence among adults in San Juan, Puerto Rico	2072	Sigma-1R antagonist (BD1047) prior to cocaine reduces cathepsin B secretion in HIV-1 infected macrophages in vivo and in vitro
1967	Assessment of the validity of anal Pap cytology and HPV typing in the detection of anal intraepithelial neoplasia in women	2079	The Role of Lateral Orbitofrontal Projections in a Rodent Model of Persistent Avoidance
1970	Estimado de Dolor en Niños Conectados a Ventilación Mecánico en la Unidad Cuidado Intensivo	2104	Encouraging parents to read aloud to babies in the neonatal intensive care unit (NICU) as a resource to promote early literacy
1976	Acquiring Clinical Skills with Standardized Patients: Integrating Qualitative and Quantitative Methods	2116	Síntomas de Depresión y el Control de los Niveles de Glucosa en Sangre en Adultos con Diabetes Mellitus Tipo 2 en Puerto Rico
1984	Patients' Satisfaction Regarding Implant-Retained Prosthesis: A Ten Year Follow-Up Study	2124	Pathological Distribution of Breast Cancer in Puerto Rico: A Comprehensive Analysis of Cancer Registry Data from 2010-2012
1985	Antimicrobial Resistance Patterns in Puerto Rico: A Cross-Sectional Review of Hospital's Antibiograms	2126	The role of Cathepsin B secretion of HIV-infected MDM on neuronal apoptosis
1989	Maternal Hypertension as a Risk Factor for Severe Hypospadias	2127	Rare Mutations in ADCY9 from Puerto Ricans with Orofacial Clefts
1992	Assessment of the Clinical Utility of Pharmacogenetic Testing in a Comprehensive Medication Management Service	2134	An Association between Alzheimer's Disease and Depressive-Affective Disorders in a Hispanic Population
1998	Etiology, Factors, and Outcomes Associated to Open Elbow Release after Post-Traumatic Elbow Stiffness	2138	Accuracy of the Short Blessed Test and the Clinical Dementia Rating Scale – Memory Domain as screening tools for Early Onset Alzheimer's Disease
2003	Las Experiencias Clínicas de los Estudiantes de Enfermería: Estudio de Caso hacia la Integración de la Mentoría	2149	Development of a Transition of HealthCare Curriculum at the University of Puerto Rico's Pediatrics and Internal Medicine-Pediatrics Residency Program
2008	EtOH activation of $\beta$ -catenin signaling promotes TCF/LEF transcriptional regulation and Wnt secretion	2156	Pobreza entre los ancianos: características sociodemográficas y económicas de la población de 65 años o más en Puerto Rico, 2012 -2016
2014	Social Isolation Stress Increases Anxiety-like Behavior on Male Sprague Dawley Rats.	2162	Hurricane Maria's impact on long term care facilities in Puerto Rico: A Pilot Study
2018	Gene Polymorphisms linked to Clopidogrel Response within the Puerto Rican Population	2164	Mental Health Providers that integrate Evidence-Based Practices for Anxiety Disorders in Puerto Rico
2019	Exonic and Intronic Novel Variants in GRHL3 from Puerto Ricans with Cleft Palate	2167	Presenilin- 2 Gene Mutation Identified in Seven Hispanic Patients Presenting with Fronto-Temporal Dementia-like Phenotype
2021	Presence of Gastrointestinal Parasites in Macaca mulatta in a Seasonal and Diverse Environment: Implications of Parasites and Sociality on Wildlife	2176	Cross Cultural Adaptation of a Questionnaire to Assess Post-Partum Pain Management Satisfaction Upon Hospital Discharge
2025	Towards an accurate anatomical measurement of the human liver: lessons from Ultrasound and MRI	2179	How does the learning environment influence the behavior of residents?
2037	African genetic ancestry is associated with BRAF-mutated colorectal tumors and distal location in Puerto Rican Hispanics with colorectal cancer	2181	Asthma and COPD Overlap Syndrome in Puerto Rico: A Descriptive Study
2047	Sobrecarga y trastornos del sueño en los cuidadores de pacientes con Alzheimer	2193	Effects of Summer Internship and Follow-up Distance Mentoring Programs on Middle and High School Student Perceptions and Interest in Health Careers
2055	Simvastatin Improvement of Cardiovascular Status in Diabetes; A Quantitative Proteomic Approach		
2058	Characterization of Endometrial Cancer Donors at the UPR Comprehensive Cancer Center Biobank		
2064	Modulation of nicotinic receptors by cannabinoids		

SID	Title
2203	Regulation of Adaptive Immunity by 2-deoxyguanosine nanoparticles co-formulated with a chimeric DNA plasmid encoding for Vaccinia virus A27L antigen
2208	Previous Immunity to Zika Modulates Dengue Infection Pathogenesis and Immune Response Kinetics in Rhesus Macaques

SID	Title
2210	Dimethyl fumarate decreases cathepsin B release from HIV-infected macrophages
2215	Contraceptive use among Hispanic Women living in San Juan Puerto Rico
2219	Knowledge about contraceptive methods among Hispanic Women living in Puerto Rico

### Abstracts that reported IACUC protocol number

SID	Title
1805	Synergistic effects of Dantrolene and Nimodipine on the PHE-induced Contraction and ACh-induced Relaxation in Aortic Rings from Diabetic Rats

SID	Title
2042	Identification of a Novel Compound with Antimalarial Activity
2166	Use of Mathematical Non-linear Growth Functions to Model Plasmodium berghei Parasitemias