Poster Number: 1

Category: Early Stage Investigator

Integration of Poisoning and Deaths Data to Predict and Prevent Drug Deaths

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West Virginia (WV) has the highest unintentional drug death rate in the country. Multiple co-intoxicant drugs are typically found with opioids in these deaths. Since drug use patterns contributing to death have been changing over time, up-to-date data are necessary to fully understand the drug mortality problem. To estimate the risk of death from specific drugs/drug combinations in different areas of WV, numbers of both fatal and nonfatal overdoses are needed. An existing forensic drug database (FDD) currently contains comprehensive data for WV drug-related deaths from 2005 through 2011. The WV Poison Center (WVPC) accesses an extensive national database of poisoning cases from 1983 to present. This project is being conducted to determine how to best integrate poisoning data with the FDD drug death data for poisoning and death rate calculations; identify WV populations with high poisoning and death rates for individual drugs and drug combinations and determine changes over time; determine if the non-fatal poisoning rate correlates with the death rate for various abused drugs and estimate the risk of death from intoxication with these substances; and, work with outreach infrastructures and established networks to disseminate project findings. Determining the scope and characteristics of the poisonings and drug-related deaths in specific geographic areas are critical initial steps for targeting prevention and educational efforts to community needs. This pilot project will translate drug poisoning and death rate data at local and county levels into potential interventions that could prevent WV drug poisonings and deaths.

Poster Number: 2

Category: Senior Investigator

Targeting SHP2 for the Treatment of HER2-Positive Breast Cancer

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Approximately 20-30% of breast cancer (BC) is caused by overexpression of the human epidermal growth factor receptor 2 (HER2), on the basis of which anti-HER2 therapies have been developed. Although these drugs have benefited BC patients, development of resistance, disease recurrence, and in some case, lack of response to anti-HER2 drugs have been insurmountable problems. Therefore, alternative therapeutic strategies for the treatment of HER2-positive BC shall be sought. Multiple lines of evidence show that the Src homology 2 phosphotyrosyl phosphatase 2 (SHP2) might be a better alternative for the treatment of HER2-positive BC. This is entirely possible because SHP2 is essential for signaling, not only by HER2 itself, but also by other receptor tyrosine kinases, cytokine receptors, and Wnt/β-catenin, which are all reported to promote anti-HER2 therapy resistance. Hence, targeting SHP2 can potentially cure both treatment naïve and anti-HER2 therapy resistant HER2-positive BC. In line with this concept, we have invented a specific small molecule SHP2 inhibitor (WGMDY) that has shown promising anti-cancer effects in HER2+ BC cells in culture and *in vivo*. The results obtained so far show that inhibition of SHP2 with WGMDY suppresses cell proliferation or induces cell death in a concentration dependent manner. In addition, the results show that inhibition of SHP2 blocks anchorage independent growth and cancer stem cell properties under cell culture conditions and induces regression of preformed xenograft tumors. These findings suggest that SHP2 might be an excellent drug target for HER2-positive BC and WGMDY has a promising potential to serve as a lead compound for development of anti-SHP2 drugs.

Poster Number: 3

Category: Early Stage Investigator

Challenges of Patient Recruitment in a Randomized Clinical Trial of Clomiphene Citrate for Obese, Young, Hypogonadal Men

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Introduction: West Virginia has one of the highest rates of obesity and Type 2 diabetes in the Nation. Obesity in males is associated with low testosterone that may begin at a young age leading to a vicious cycle of obesity and low testosterone in young adult males. We are currently studying whether treatment with the SERM, clomiphene citrate (CC), improves testosterone levels, and in turn the attendant obesity and metabolic syndrome. Many challenges exist in recruiting and retaining research participants in this young obese male population which often does not seek medical help. Partnerships between researchers and communities are essential for the success of all clinical research studies, particularly in areas of high impact such as obesity and in difficult-to-recruit patients.

Methods: A randomized, placebo-controlled, double blind prospective trial using CC in a series of obese HG males, ages 18-35 years, in each group, with a goal to recruit 20 subjects in each group. Advertisements for the study were in the form of Google Ad, newspaper Ad, fliers and posters, face to face visits with health care providers and community clinics as well as various schools and colleges. Efficacy of CC is being assessed in terms of potential improvement in testosterone levels after 25 mg daily CC therapy along with diet and exercise counseling, over a 6 month period and a 6 week weaning period. Changes in lean and fat mass, bone density, insulin resistance, waist circumference, mood, behavior, and visceral fat are being recorded along with any potential adverse events.

Results and Conclusion: So far we have been able to randomize only 6 patients in the study, compared to the 40 subjects that are needed. Conducting a randomized, prospective trial (the gold standard) in a young, obese male population presents many challenges both in recruitment and retention. We conclude that:

- We need increased awareness about clinical research at the local level: both among physicians and their patients.
- This awareness is built upon the foundation of trust and relationship between physicians/ health care providers and their patients who have common questions and concerns.
- There need to be partnerships between community clinics, large institutions such schools, colleges and clinician researchers.
- There is a critical need to develop infrastructure and strategies for successful recruitment and retention of special populations that can be difficult to reach.
- There needs to be networking between clinician researchers throughout the state to enhance collaboration to share subjects, resources and data, to optimize the use of research dollars and improved quality of clinical studies.

Poster Number: 4

Category: Early Stage Investigator

Improving Pharmacologic Prevention of VTE in Trauma: IMPROVEIT QI project

Audis Bethea, PharmD, BCPS, Elliot Adams, MD, Damayanti Samanta, MS, Julton Tomanguillo Chumbe, MD

Introduction/Hypothesis:
Emerging literature suggests commonly used regimens of low molecular weight heparins (LMWH) achieve sub-optimal anti-factor Xa levels in 50-70% of trauma patients and promote a significant increase in venous thromboembolisms (VTE) following traumatic injury. Our trauma service endeavored to develop a standardized approach to the pharmacologic prevention of VTEs with LMWH in an effort to optimize pharmacologic prevention and reduce VTE rates.

Methods:
In October 2015 a protocol was implemented that provided weight adjusted, initial dosing parameters with subsequent dose titration based upon anti-factor Xa levels targeting concentrations of 0.2-0.5 IU/mL. Regimens achieving sub-therapeutic concentrations were increased by 20% per dose, while supra-therapeutic regimens were decreased by 20% per dose. VTE rates were evaluated prior to, and after the implementation of the protocol. Twelve months of data preceding implementation were compared to 10 months post-implementation. VTE rates were obtained from the institution's trauma registry. Changes in VTE rates were examined with p-values of ≤0.05 considered significant.

Results:
There were 31 VTEs in 1542 (2.01%) patients prior to implementation and 13 in 1432 (0.91%) in the post-implementation group yielding a significant decrease in overall rates by 54.7% (p=0.013). The monthly VTE average also decreased by 62.3% (2.18% to 0.82%, p=0.013). There were no adverse effects or incidents of bleeding that were attributable to LMWH in the post-implementation phase.

Conclusions:
This approach to the management of VTE prophylaxis with LMWH resulted in a significant reduction in VTE rates. Implementation of similar practices may be equally impactful in other patient populations and institutions.

Poster Number: 5

Category: Early Stage Investigator

Dual Use of Cigarettes and Smokeless Tobacco: Product Use and Nicotine Exposure

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Introduction: Smokeless tobacco (SLT) products have been marketed to smokers as a means to reduce risk of tobacco-related diseases or to use in situations where smoking is prohibited. An (un)intended consequence of such marketing may be that smokers supplement rather than replace their cigarettes with SLT. **Purpose:** To compare product use and nicotine exposure on days when only cigarettes are smoked (single use) versus when both cigarettes and SLT (dual use) are used.

Methods: Thirty dual users (≥ 5 cigarettes per day for ≥ 1 year, and ≥ 2 SLT uses per day on ≥ 4 days per week for ≥ 6 months) recorded their product use daily for two weeks via ecological momentary assessments using a mobile device. They also collected a saliva sample and butts from all cigarettes smoked each day during the two-week period.

Results: Participants reported use of both cigarettes and SLT on 80% of study days. The number of cigarettes recorded was significantly correlated ($p < .01$) with the number of cigarette butts collected. Levels of cotinine (nicotine metabolite) were significantly higher on dual versus single use days (mean±SEM = 357.5±12.3 ng/ml versus 289.4±18.1 ng/ml, respectively; $p < .05$), though the number of cigarettes recorded did not differ between these days (10.2±0.4 versus 10.0±0.8 cigarettes, respectively; $p > .05$).

Conclusions: Smokers used SLT to supplement rather than replace cigarettes, consequently exposing themselves to greater levels of nicotine. Study findings can inform policies surrounding harm reduction strategies and indoor smoking laws.

Poster Number: 6

Category: Student / Resident / Fellow

Somatic Afferent Stimulation to Improve Patient Outcomes: fMRI imaging

Alyssa Chafin ?
J. W. Lewis PhD, Department of Neurobiology & Anatomy, West Virginia University W. T. Stauber PhD, Department of Physiology and Pharmacology, Division of Physical Therapy, West Virginia University C. Smith M.D, Department of Neurology, West Virginia University

Patients admitted to intensive care units (ICUs) often develop secondary deficits related to decreasing skeletal muscle strength as well as a decrease in muscle mass. This in turn can result in prolonged stays in ICU, the development of dependence on mechanical ventilators, and increased mortality rates. Neuromuscular electrical stimulation (NMES) is a recent and encouraging therapy that could mimic the positive, systemic benefits of exercise (like the benefits from taking walks) and thereby minimize muscle atrophy, particularly for non-ambulatory or bed-ridden patients. Anecdotal evidences suggest that the benefits of NMES include improvement with both systemic circulation as well as an increase in muscle function of muscles not directly stimulated by the respective NMES technique. However, the underlying physiological or neurological mechanisms remain unclear. Either the contracted muscles produce the systemic effects, or afferent stimulation mediated by the central nervous system (CNS) improves both muscle function and systemic circulation. By utilizing functional magnetic resonance imaging (fMRI) this study aims to identify brain regions that are relevant in the translation of an NMES therapy to remote changes in muscle function and systemic changes in circulation. Participants will complete treatments consisting of both small muscle contraction (2Hz) and skin stimulation (10 Hz) using transcutaneous electrical nerve stimulation (TENS). Based on our preliminary data, this study is expected to newly reveal CNS mechanisms underlying how NMES therapy can improve function and outcomes in ICU hospitalized patients.

Poster Number: 7

Category: Early Stage Investigator

Cadherin-mediated radio-sensitization in GBM involves down-regulation of anti-apoptotic Bcl-2.

Christopher P. Cifarelli MD, PhD; Department of Neurosurgery, West Virginia University, Morgantown, WV

Background: Resistance to chemo-radiotherapy in residual GBM remains an obstacle in achieving disease stability following maximal surgical resection. Although molecular characterization of gliomas has emerged as a means of classification/prognostication, few, if any, molecular determinants of glioma are used as a basis for treatment. In our GBM model, we developed a strategy for increasing radio-sensitivity via manipulation of cadherin-mediated cell adhesion. Prior studies demonstrated an increase in radiation-induced cell death in U87MG and U251MG cells in culture following exposure to a recombinant E-cadherin protein, while in vivo studies in NSG mice using the E-cadherin-Fc resulted in increased overall survival following radiation. In the current study, we have delineated some of the downstream effectors of cadherin-mediated radiation sensitization, including members of Bcl-2 family of apoptotic proteins in both normoxic and hypoxic conditions representative of the tumor microenvironment.

Methods: Utilizing recombinant E-cadherin-Fc fusion proteins in the U87MG cells, a 2X 100 paired run RNA-sequencing analysis was performed on the Illumina-HiSeq1500 in conjunction with the WVU and Marshall University Genomics facilities. Hypoxic cells cultures were maintained at 1%O_2 and semi-quantitative RT-PCR for Bcl-2 according to MIQE guidelines.

Results: E-cadherin-Fc treatment results in a significant reduction of BCL2 ($\log_2$ -0.76749; p=0.003) compared to control, while hypoxic culture conditions result in a dose-dependent increase in Bcl-2 in radiation resistant U87MG cells following external beam radiation.

Conclusion: Increased radiation-induced cell death following E-cadherin-Fc exposure in U87MG cells is associated with a decrease in the expression of anti-apoptotic Bcl-2, normally upregulated following radiation in hypoxic conditions.

Poster Number: 8

Category: Early Stage Investigator

Misexpression of the MafB transcription factor in islet β cells stimulates cell proliferation and enhances glucose tolerance during pregnancy

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MafB is normally only expressed in islet α cells in mice, but is also co-produced with MafA in adult β cells in humans. However, rodent MafB is induced in a small fraction of MafA+ cells during pregnancy. Here we used *MafA* transcription control sequences to transgenically direct MafB to islet β cells (i.e. termed *MafBtg*) to assess the impact of both MafA and MafB activity in this context. There was no effect on glucose tolerance or β cell proliferation in adult *MafBtg* mice, even when *insulin*, *G6PC2*, and *cyclinD2* mRNA levels were enhanced. Expression was likely stimulated by MafA/B co-binding, which were both enriched within gene control sequences in Re-ChIP assays. Interestingly, glucose tolerance and β cell proliferation was increased in MafBtg mice during pregnancy. The metabolic improvements appear to be mediated by elevated insulin secretion capacity. Future efforts are directed at determining mechanistically why MafB is so influential to maternal β cells, and directly examining how MafB impacts human islet β cells.

Poster Number: 9

Category: Early Stage Investigator

Sepsis Triggers Release of Plasma Microvesicles (MVs) Containing Epigenetic Regulators Impact Autophagy

Duaa Dakhlallah, Jon Wisler, Tierra Ware, Amal Amer, Yijie Wang, Amy Gross, Joyce Obeng, Ahmad Dakhlallah, Timothy D. Eubank, Clay Marsh.

Rationale. Sepsis is a disease with high mortality and morbidity. Systemic immunosuppression associated with severe sepsis is a poor acute prognostic marker and predispose survivors to increased morbidity and mortality. Recent studies suggest that epigenetic regulation of key inflammatory mediators including TNF-α. Although global suppression of myeloid proinflammatory gene expression occurs, no mechanism has been identified. We observed that septic microvesicles production is increased, carry miRNA, mRNA and proteins. we found that autophagy pathway is halted in Sepsis due to hyper-methylation of autophagy key genes. we hypothesized that DNMT mRNA transcripts may be transferred from MVs to naïve monocytes and endothelial cells resulting in reducing inflammatory gene expression and repressing autophagy pathway through increase in DNA methylation.

Results. MVs from septic patients had significantly increased mRNA for DNMTs compared to MV from critical illness without sepsis patients Additionally, naïve monocytes and primary endothelial cells treated with MVs from patients with sepsis demonstrated increased expression of DNMTs, dramatically decrease in autophagosome formation and reduced TNF-α expression at 24 hours. on the other hands, treating cells with 5aza and rapamycin decrease DNMTs expression, and demethylate TNFα, and autophagy genes resulting in the increase autophagy process and restore hemostasis of the cells treated with septic MVs.

Conclusions. epigenetic regulators including DNMTs are highly expressed in plasma MVs in patients with sepsis and can cause proinflammatory cytokine gene and autophagy pathway silencing. Treating with DNMTs inhibitors and autophagy activator may be a therapeutic strategy in Sepsis.

Poster Number: 10

Category: Early Stage Investigator

Emergency Department Visits for Sexual Assault by College-Aged Women: Is Alcohol a Factor?

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Sexual assault on college campuses is a growing concern. Alcohol use is associated with an increased risk of sexual assault and at least half of sexual assaults among college students involve alcohol consumption by victim, perpetrator, or both. The emergency department (ED) is a common point of entry into the medical system for victims of sexual assault, yet few studies have examined characteristics of ED visits related to sexual assault among college-aged populations. The aim of this retrospective medical record review was to analyze ED visits related to sexual assault by college-aged patients and determine if alcohol consumption by the patient was noted. From 2012-2014, 118 patients aged 18-25 presented to West Virginia University's ED for sexual assault. All patients were female and their mean age was 20 years. Sexual Assault Nurse Examiner evaluation was conducted in 84% of cases and 86% were prophylaxed for Gonorrhea and Chlamydia. Of those aged < 21, 74% reported alcohol consumption in contrast to 48% of those ≥ 21. Of those reporting alcohol use, 36% were evaluated on the day of the assault compared to 61% of those not reporting alcohol use. Our study revealed ED visits for sexual assault in college-aged patients were more common in younger patients. Alcohol use occurred more frequently with patients under the legal drinking age; and, if alcohol was involved, ED presentation was more likely to be delayed. Prevention programs on college campuses should include information on the associations between rates of sexual assault and alcohol use

Poster Number: 11

Category: Early Stage Investigator

Immersive Virtual Reality Portal into Cellular and Subcellular Brain Structure

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Exploring the brain ultrastructure at subcellular resolution has the potential to reveal new insights into organizational and functional features of the brain across species and in human disease. Current tools supporting such visual investigation are limited in many respects. They either allow the 2D visualization of 3D data (i.e., volumetric or mesh) via perspective projection or by slicing the volume, or, they provide a 3D visualization through virtual reality based on expensive CAVE systems. We have developed syGlass and syBook, an integrated software platform for navigating neuronal scenes in an immersive virtual reality environment (IVR), by leveraging state-of-the-art inexpensive head mounted displays, such as the HTC Vive and the Oculus Rift. We developed a range of targeted, efficient command options for navigation, manipulation and cataloguing of real neural scenes, represented by data such as serial block-face scanning electron microscopy, light microscopy, light-sheet microscopy, and 3D meshes. syBook is a virtual lab notebook that facilitates the interactive cataloguing, search, and retrieval of 3D IVR scenes with associated descriptive annotations. syGlass is a state-of-the-art high-performance IVR viewer and toolset for the visualization, and interactive IVR annotation of large and complex neuronal datasets. The proposed approach will likely push the boundaries of the current understanding of brain data modifications that are likely consequence of health disparities such as addiction and stroke, and that are difficult to appreciate with current data analysis and visualization tools.

Poster Number: 12

Category: Student / Resident / Fellow

Cognitive impacts of recurring inflammatory/infection-like experiences during aging

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Infections are common occurrences in life. In addition to inducing sickness behaviors, infections also acutely impact cognition. While the immediate consequences of infection are known, the long-term cognitive consequences of repeated intermittent infections are not well-studied; some evidence suggests that higher lifetime infection burden is associated with greater cognitive decline. Here, we investigated recurring inflammatory/infection-like experiences, health outcomes, and cognitive performance in aging mice, hypothesizing that repeated immune activation could explain, at least in part, age-related cognitive decline. C57BL/6 male mice (10 months) received an intraperitoneal injection of vehicle or LPS every 14 days for 2.5 months. For each injection (#1-5), the dose of LPS was 0.4, 0.8, 1.6, 3.2, and 6.4 mg/kg, respectively. We evaluated sickness behaviors using a 20-point scale at 4 hours, and 14 days, post-injection. Following the final injection/recovery period, animals were cognitively characterized. We predicted that 1) following each exposure, LPS treatment would induce a moderate sickness response from which animals would make a full or nearly full recovery, and 2) this repeated inflammatory/infection-like experience would detrimentally impact cognitive ability. Results indicated that LPS induced moderate sickness behavior within 4 hours; 2 weeks post-injection, LPS-treated animals exhibited health/sickness scores similar to Vehicle-treated controls. LPS-treated mice showed inferior learning on tests of passive avoidance and spatial navigation. Thus, recurring infections during mid-life transiently induced sickness behaviors and had long-term cognitive impacts. This indicates that frequency of immune activation may influence the trajectory of age-related cognitive decline and could be a therapeutic target to facilitate ‘graceful aging’.

Poster Number: 13

Category: Student / Resident / Fellow

Standardized Model of Staphylococcus aureus Femoral Implant Associated Infection

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Introduction: The infection burden of total joint arthroplasty is expected to rise significantly over the next 15 years. Prosthetic joint infections (PJI) are often due to biofilm producing organisms. Standard *in vitro* quantification is vital in the assessment of novel treatment modalities. Coupons of common orthopaedic biomaterials are currently utilized for *in vitro* biofilm development; however, these coupons do lack the geometry and surface area to replicate clinical presentations of PJI. The purpose of this study was to establish a novel standardized femoral implant infection model in order to assess the impact of proposed translatable treatment strategies.

Methods: A custom femoral component reactor (FCR) system was created that provided a temperature controlled environment, in which the component is stabilized and exposed to shear forces in a bacterial culture of *Staphylococcus aureus.* Specific 1 cm^2 were identified for quantification. FCR biofilm quantification either consisted of scraping technique to determine colony forming units or crystal violet staining with to determine absorbance. This was repeated by two separate technicians for reproducibility.

Results: These methods produced consistent, technician-independent results with no significant differences between medial and lateral condyles for both quantification methods ($p > 0.05$). Across both condyles, one technician produced an average $1.53x10^7$ CFU/cm^2 and 0.840 absorbance, as where a different, previously unaffiliated technician produced an average $1.58x10^7$ CFU/cm^2 and 0.090 absorbance ($p > 0.05$).

Conclusion: This model provides a rugged platform in which we can assess new treatment modalities in efforts to treat adherent biofilm found in prosthetic joint infections.

Poster Number: 14

Category: Early Stage Investigator

Desmoplakin expression induced by the novel prolyl hydroxylase-3 inhibitor AKB-6899 suppresses breast cancer cell migration and promotes aggregation

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The purpose of this study is to: *1)* determine the ability of a novel small molecule inhibitor of prolyl hydroxylase-3, AKB-6899, to induce mRNA and protein expression of Desmoplakin (*DSP*) in metastatic human breast tumor cells; *2)* evaluate DSP function in regulating tumor cell migration and aggregation; *3)* assess toxicity on both normal mammary epithelial and breast tumor cells; and *4)* in ongoing work, assess its potential as a treatment for metastatic breast cancer using patient-derived xenografts (PDX) in vivo.

DSP is a member of the plakin family and major protein component of the desmosome. It serves as the anchoring protein for keratin cytoskeletal filaments intracellularly and cadherin proteins extracellularly to maintain strong adhesive junctions between cells. Clinically, DSP expression is reduced as breast cancer progresses and its loss predicts a poor prognosis and increased risk of metastasis.

We demonstrate that AKB-6899 augments *DSP* mRNA expression in both mouse and human breast cancer cells by qRT-PCR and DSP protein expression using immunofluorescence microscopy. More importantly, we show that this up-regulation of DSP induces functional changes in tumor cells by significantly increasing tumor cell aggregation and decreasing cell migration on both 2D surfaces and 3D nanofiber-coated matrices. These effects are observed using concentrations of AKB-6899 that are not toxic to the cells as shown by XTT and Trypan Blue exclusion assays.

In summary, our pre-clinical data supports the potential for AKB-6899 as a novel therapy for metastatic breast cancers which lose DSP expression as they progress.

Poster Number: 15

Category: Early Stage Investigator

The mitoNEET Ligand NL-1 is Neuroprotective in Cerebral Reperfusion Injury

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Ischemic stroke affects a significant number of patients each year. Based on the finding that the antidiabetic drug pioglitazone is neuroprotective in stroke, we evaluated a novel mitoNEET (CISD1) ligand (NL-1) devoid of **peroxisome proliferator-activated receptor gamma (**PPAR-γ**),** in a murine t-MCAO (transient middle cerebral artery occlusion) model of ischemic stroke. Mice were treated with NL-1 (10 mg/kg, i.p.) 30 minutes before reperfusion injury and allowed to recover for 24 hours. We found that NL-1 reduced the infarct volume by 43% and reduced edema by 58%. A kinase panel screen indicated that NL-1 does not inhibit directly any kinases significantly with only a modest inhibition of the WNK lysine deficient protein kinases (WNK3>WNK2>WNK1). NL-1 was additionally found to decrease reactive oxygen species production with an IC50 of 5.95 μM. Taken together with respiration data on isolated mitochondria our findings suggest that NL-1 protects against the reperfusion injury in stroke via direct interaction with mitochondria. This is the first report showing the mitoNEET ligand NL-1 as neuroprotective in cerebral reperfusion-injury.

Poster Number: 16

Category: Early Stage Investigator

App Development for Overweight and Obese Pregnant Women in West Virginia: Formative Efforts and Protocol for the Feasibility Trial

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Obesity during pregnancy places women at increased risk for several complications and health concerns. Weight management interventions for pregnant women have shown efficacy but most are time and resource intensive creating a need for portable mobile health (mHealth) app development projects specific to this population. This formative study was intended to provide information for a mobile health (mHealth) app intended to help overweight and obese pregnant women manage their body weight during pregnancy. Women were recruited using non-paid media sources and from Family Medicine at West Virginia University. A semi-structured interview guide was developed and pilot tested with two pregnant women. Questions in the interview guide focused on the pregnancy experience, body image, emotions, perceptions, physical sensations experienced, and information about diet, physical activity behavior, and mHealth usage. All interviews were transcribed verbatim and content analyzed. Two experienced qualitative researchers used inductive and deductive analyses to allow emergent themes to be observed. Eleven women completed the interviews (Mage=30.16) who were an average of 26 weeks into their pregnancy (MBody Mass Index =26.45) who all planned to have natural births. Six themes were observed in the interviews and included body image, images of the baby, app use, diet, exercise, and the experiences of pregnancy. Verbatim quotations will be provided highlighting these themes. Information will be provided about the feasibility trial to begin January 1, 2017 including the apps' features, plans for recruitment, and outcome measures.

Poster Number: 17

Category: Early Stage Investigator

The Value of Expressive Writing on Quality of Life and Facilitating Advance Care Planning: A guided exercise for patients with cancer

Carl Grey, MD & Renée Nicholson, MFA

Our project is a guided exercise in expressive writing with patients with cancer in the infusion center at the Mary Babb Randolph Cancer Institute. We believe that it will improve aspects of patients' quality of life, and will help prepare patients for Advance Care Planning discussions as well as facilitate their loved one's understanding of and respect for the patients' wishes. We base this hypothesis on:

1. Previous research indicating that expressive writing can positively affect many aspects of quality of life.

2. Patients want to have Advance Care Planning discussions, but Advance Directives typically lack the narrative that provides the context for the discussion.

3. Storytelling can help facilitate rapport between the patient, the family and the heath care professional, particularly in patients from Appalachia.

Expressive writing is one way, under the larger umbrella of narrative medicine, to help patients discover and explore meaning. Leaders in the field of narrative medicine believe considering the patient's narrative can make medical research, teaching and practice more effective. Years of research have shown that expressive writing may improve physical and psychological well-being. A few studies have been piloted in cancer centers.

Poster Number: 18

Category: Early Stage Investigator

Facilitating improved patient engagement in weight management through mHealth technology use in patients' visit waiting time.

Authors: Treah Haggerty MD MS; Geri Dino PhD; Peter Giacobbi Jr. PhD; Thomas Hulsey MSPH; Melissa D. Olfert, DrPH MS RDN LD

Context: Clinical practice guidelines exist for management of obesity. Unfortunately, these guidelines are rarely used. This project will 1) develop mHealth technology for weight management guidelines using patient empowerment principles, 2) determine usability of the application in primary care patients, and 3) provide understanding of feasibility of delivering patient education in this format.

Objective: The central hypothesis of the proposed research study is that an mhealth application to deliver guideline based patient education which includes patient empowerment principles can be developed in a way which is usable, acceptable, and practical.

Design: Mixed-method pilot study

Setting: Academic Primary Care Outpatient Clinic

Patients or Other Participants: Participants meeting inclusion criteria will be approached by telephone by CTRU staff one day prior to their scheduled clinical visit. Recruitment will take part with study personnel only. Inclusion criteria for clinic visit participants will be (1) between the ages of 18 and 65, (2) able to visually take part in a mHealth application, (3) able to verbally identify application issues, (4) live within 15 minutes of Morgantown and (5) have a BMI greater than 25.

Intervention/Instrument: mHealth technology for patient empowerment utilizing weight management guidelines

Main and Secondary Outcome Measures: In order to accomplish this study we will look at mHealth use for weight management education and patient empowerment through 1) usability, 2) acceptability, 3) practicality and 4) demand.

Conclusion: An mhealth application to deliver guideline based patient education which includes patient empowerment principles can be developed in a way which is usable, acceptable, and practical.

Poster Number: 19

Category: Senior Investigator

Dissemination approaches to participating primary care providers in a quality improvement program addressing opioid use in Central Appalachia

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Introduction: Practice Based Research Networks (PBRNs) have been described as "new clinical laboratories for primary care research and dissemination."[1] However, PBRNs have sometimes struggled to disseminate research results in a meaningful way.

Methods: The Central Appalachia Inter-Professional Pain Education Collaborative (CAIPEC) was developed as a collaborative effort between the University of Kentucky College of Medicine, Department of Family and Community Medicine and West Virginia University Health Science Center, Department of Family Medicine to work with 8 rural PBRN clinics and 20 primary care providers using Quality Improvement (QI) methods over a 15 month period, delivered state-wide continuing education activities to address the issue of opioid use in chronic pain patients, and developed a multi-modal mechanism to disseminate project results back to clinic and participating providers.

Results: Successful change in the delivery of chronic pain care was dependent on the clinic's commitment to a team-based, patient-centered approach. Quarterly updates were disseminated through a newsletter and evidence-based results were disseminated through outcome dissemination packets, a best practice share call, a quality improvement interventions share document, presentations at state wide PBRN conferences, and publications.

Discussion: The CAIPEC project utilized an extensive and innovative dissemination plan, under the rubric "continual dissemination." Unlike traditional dissemination efforts that focus on summary presentations and manuscripts after the completion of the project, this initiative utilized a continual dissemination approach that, in addition to summative presentations, updated participants quarterly through multiple means throughout the project.

Poster Number: 20

Category: Senior Investigator

Quantitative Fluorescent Microscopy to Measure Vascular Pore Sizes in Primary and Metastatic Brain Tumors

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Background: The blood-brain barrier (BBB) restricts the penetration of numerous chemotherapeutics from entering brain parenchyma. When a tumor resides in the central nervous system (CNS) the BBB is compromised which results in size dependent increases in vascular permeability, with magnitude of changes being dependent on tumor type and location. Currently most experimental work to determine the size of a cancer therapeutic that can penetrate CNS tumors, is through administering progressively larger molecules until cutoff is observed where little to no tumor accumulation occurs. However, experimental work and mathematical modelling, 20-30 years ago document methods to calculate both the size of the vascular opening (pore) with solute permeability values. This knowledge is invaluable in predicting if an antibody, a protein a small molecule, etc... can and to what degree penetrate into a CNS lesion. Herein, we update this classic mathematical modelling approach with quantitative fluorescent microscopy in two preclinical tumor models. The method and equations described, allows simultaneous administration of multiple sized tracers to determine vascular permeability at a resolution of nearly one micron.

Results: We observed that three molecules ranging from 100Da to 70kDa permeated into a preclinical glioblastoma model at rates that were proportional to their diffusion rates in water. This suggests the solutes freely diffuse from blood to glioma across vascular pores without steric restriction which calculates to a pore size of >140 nm in diameter. In sharp contrast in a brain metastases of breast cancer model, the calculated pore size was ~10 fold smaller than what was observed in the glioma vasculature.

Implication of the Advance: This work proposes a novel hypothesis based upon the observed data: Traztuzumab most likely fails in the treatment of brain metastases of breast cancer because of poor CNS penetration, while the similar sized antibody bevacizumab, has effect in the same tumor type not because it penetrates the CNS degree better, but because it scavenges VEGF in the vascular compartment which reduces edema and permeation.

Major Findings: Data from our model provides evidence for why antibodies may have efficacy in glioblastomas but generally fail in brain metastases of breast cancer.

Poster Number: 21

Category: Senior Investigator

Developing a system for PDX *in vivo* genetic manipulation and selection.

Yuriy Loskutov, Daniella Munezero, Elena Pugacheva

Patient derived xenograft (PDX) is a powerful tool designed with the focus on personalized medicine. It can become a standard system for drug discovery as well, providing more robust platform for screening of the potential drug targets. PDX allow to account for 3D environment, interaction with stroma and host metabolism, in contrast to 2D and artificial 3D matrix systems. However genomic modification of PDX is a difficult task, sometimes impossible due to inability of the PDX derived cells to grow on plastic. Also recent publications outline the promising avenue for utilizing diphtheria toxin as an *in vivo* selection agent; there are no currently available tools to do so.

We designed a toolkit for self-inactivating lentivirus-based delivery of inducible shRNA or mRNA directly into the PDX grown in a mouse with the ability to select for the infected tumor cells via diphtheria toxin. This system allows for the robust tumor cell genomic manipulation, and detection; allowing to use PDX platform as a basis for potential drug targets screening.

Poster Number: 22

Category: Student / Resident / Fellow

Traumatic Brain Injury and MicroRNAs: A Novel Approach for Treating Neurotrauma

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1 West Virginia University Center for Neuroscience
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Background: traumatic brain injury continues to present a significant clinical challenge in terms of neurosurgical management and pharmacologic treatment options. A primary unknown research area is how acute injury alters the underlying biochemical landscape to affect long-term outcomes. Recent evidence suggests that microRNAs are master regulators that control multiple inflammatory and cell injury pathways. We sought to investigate these master regulators following TBI, and whether microRNA levels can be successfully targeted pharmacologically.

Methods: serum samples were collected from adult traumatic brain injury patients prior to any intervention. MicroRNA was isolated and quantification was done with rtPCR. An air-acceleration TBI model was used to produce moderate injury (50 PSI) exposure in young-adult male Sprague Dawley rats. A time course of serial blood draws was performed post-injury. One group received bryostatin 0.5mg/kg and the other group received saline. MicroRNA was isolated from the serum and quantified by PCR. Prior to sacrifice, rats were tested on the elevated plus maze. The brains were removed at time of sacrifice and grouped for western blot and IHC.

Results: A significant increase in the *let7* microRNA family was seen in both the human TBI samples as well as the rats exposed to TBI. The *let7* microRNAs are master regulators of microglia related neuroinflammation. Interestingly, bryostatin significantly influenced the *let7* microRNA family. Bryostatin significantly reduced ($p<0.01$) the biphasic peak in *let7*a when given five minutes post injury. This was correlated with reduced blood brain barrier disruption assessed with CD31 staining and decreased microglia activation measured with IBA-1. Furthermore, bryostatin improved behavioral outcomes when measured with elevated plus maze.

Conclusion: microRNAs play an important but poorly understood role in neural injury. Understanding how microRNAs regulate cellular cascades following neurotrauma may offer novel approaches for pharmacologically treating patients. Further research is warranted to improve patient outcomes prior to and following intervention.

Poster Number: 23

Category: Student / Resident / Fellow

RESTING STATE MRI FUNCTIONAL CONNECTIVITY AND SENSORY PROCESSING IN AUTISM SPECTRUM DISORDER

Nadia Mardmomen and James Lewis

1 in 68 children born in the United States will be diagnosed with Autism Spectrum Disorder (ASD) according to the Centers for Disease Control (CDC, 2010). Diagnostic criteria for ASD includes a great emphasis on sensory processing deficit (American Psychiatric Association, 2013). Sensory processing dysfunction affects a person's ability to process every-day sensory information and can increase anxiety and negatively impact attention (Ayres & Tickle, 1980). Individuals with ASD have larger temporal binding windows (TBW). TBWs create the synchronous, or asynchronous, nature of two stimuli in our brains e.g. hearing/ watching a person speak. We hypothesize that wider TBWs likely makes it difficult for the brain to simultaneously process a person's face and speech from an early age, which may contribute to the social and communication dysfunction. No studies to date have examined functional, structural, and behavioral aspects of the TBW in ASD. To better understand this relationship, the current study uses magnetic resonance imaging (MRI) to explore differences in connectivity and correlate them with behavioral measures of sensory processing and integration. Participants (age 18-28 years) with high-functioning autism have been recruited along with age, gender, and IQ matched peers without autism (n=15/group). This research is significant because having a better understanding of brain mechanisms underlying sensory dysfunction in individuals with autism can help to better tailor interventions to help them improve their ability to process multiple sensory inputs and hopefully increase their participation in every-day activities.

Poster Number: 24

Category: Student / Resident / Fellow

The role of nuclear Aurora-A Kinase in Triple Negative Breast Cancer Metastasis.

Kristina Marinak (WVU Cancer Institute), Anna Kiseleva (Biochemistry), Yuriy Loskutov (WVU Cancer Institute), Matthew Smolkin (Pathology), Elena Pugacheva (WVU Cancer Institute and Biochemistry)

Aurora-A Kinase (AURKA) is a serine/threonine kinase that is responsible for centrosome maturation, spindle formation and chromosome separation during mitosis. AURKA is overexpressed in 96% of human cancers, including breast cancer. It has been previously shown that AURKA localizes to the nucleus in breast cancer metastases and especially in metastases of Triple Negative Breast Cancer (TNBC). Our objective is to define the role of nuclear AURKA in breast cancer metastasis in TNBC. Based on our preliminary findings we **hypothesized** that nuclear AURKA promotes cell survival and resistance to apoptosis in the metastatic niche. To test this hypothesis we created TNBC cell lines with CRISPR/Cas9 based deletion of endogenous AURKA. We also constructed exogenous AURKA specifically targeted to the nucleus by addition of a nuclear localization signal (NLS) or cytoplasm via addition of a nuclear exclusion signal (NES), respectively. To allow for *in vitro* and *in vivo* rescue experiments with exogenous NES or NLS AURKA in sgAURKA expressing TNBC cells, we introduced several silent mutations to avoid sgAURKA targeting. In our pilot orthotopic xenograft study with MDA-MB-231LN-luc2-Cas9 (TNBC) cells expressing sgAURKA and kinase-dead (K162M) mutant of AURKA-NLS suggests that kinase activity is required for metastatic colonization. Overall, our results indicate that the amount of nuclear AURKA is increased in metastatic breast cancer cell lines and metastases of TNBC, but the mechanism of this translocation is currently unknown. Elucidation of this mechanism is critical for development of new therapeutical strategies for control and eradication of metastatic disease.

Poster Number: 25

Category: Early Stage Investigator

Importance of The Long Non-coding RNA SPRY3 Family in Male Lung Cancers

Tayvia Brownmiller, BS, Jamie Barr, BS, Abby Harold, Erik Bey, PhD, **Ivan Martinez, PhD West Virginia University Cancer Institute, West Virginia University**

Lung cancer is the number one cause of cancer related deaths in the United States. The 5 year overall survival rate for patients with non-small cell lung cancer (NSCLC) stands at 17.8% with women having a twice better overall survival rate than men. Currently, there is no solid evidence to explain the disparity between gender survival rates. Previous studies suggest molecular differences including genes located in the sex chromosomes. While protein-coding genes of the X and Y-chromosomes have been relatively well characterized, the non-coding regions responsible for producing non-coding RNAs (ncRNAs) are not well understood. One class of ncRNAs found expressed in all chromosomes (including the sex chromosomes) are long non-coding RNAs (lncRNAs). LncRNAs are ncRNAs larger than 200 nucleotides, that function at the transcriptional and post-transcriptional level by acting as signal, guide, decoy, or scaffold RNAs. Interestingly, our preliminary data showed the overexpression of a family of lncRNAs known as SPRY3, located on the Y chromosome, in NSCLC cell lines after radiation treatment. We found a dose and time response expression of the lnc-SPRY3 family in radiation sensitive NSCLC cell lines but not in the radiation resistance NSCLC cell lines. Furthermore, knock-down of lnc-SPRY3 in radiation sensitive cell lines increased their resistance to radiation. For this reason, our hypothesis is that the SPRY3 lncRNAs are important in the process of radiation response in NSCLCs and also are a factor in gender-associated differences. To test this hypothesis, we will manipulate the expression of the lnc-SPRY3 family (exogenous over-expression or knockdown) in male NSCLC cell lines or normal lung epithelial cells before and after radiation and determine their molecular function in response to radiation therapy. Also, we will measure the expression of these lncRNAs in patient samples with NSCLC (tissue arrays) in order to evaluate their potential as molecular biomarkers. In summary, the overall objective of this project is to provide evidence of a male specific factor never before characterized in healthy or malignant tissues and allow for further advancements in understanding and treating NSCLC.

Poster Number: 26

Category: Early Stage Investigator

Use of Response-Adapted Hypofractionated Radiation Therapy to Potentiate the Systemic Immune Response to Checkpoint Inhibitors in Non-Small Cell Lung Cancer

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West Virginia has one of the highest incidence rates of smoking and lung cancer diagnosis in the United States. Non-small cell lung cancer (NSCLC) accounting for approximately three-fourths of new lung cancer diagnoses, the majority of which are locally advanced or metastatic at presentation and are associated with a poor prognosis. In recent years immune checkpoint inhibitors have become a standard treatment for metastatic NSCLC. Preclinical data suggests that radiation therapy may be uniquely suited to combine with immune checkpoint inhibitors, since radiation can disrupt a tumor's physical barriers to T-cell infiltration and augment antigen presentation, thus serving as an "in situ personalized vaccine" to activate the immune system and potentially enhance the systemic response (an abscopal effect). The primary objective of this prospective clinical trial is to determine if the addition of hypofractionated radiation therapy to checkpoint inhibitor immune therapy in NSCLC can improve the overall response rate, progression-free survival, and overall survival compared to historical data, without significantly impacting quality of life from toxicity. The circulating immune cell repertoire, cytokine/chemokine levels, and next generation sequencing of the T-cell receptor will be assessed to determine biological correlates of immune activation. Finally, univariate and multivariate analysis will be used to determine factors associated with response, in order to help determine the optimal method for combining these treatment modalities. This study is currently in the process of seeking IRB approval and aims to enroll the first of thirty-three patients by January 2017.

Poster Number: 27

Category: Senior Investigator

Health Sciences and Technology Academy Community Research Associates, An unique knowledge broker infrastructure

Morton-McSwain, Cathy: PI
Ann Chester, HSTA Director Summer Kuhn, HSTA CRA Mary McMillion, HSTA CRA

Health Sciences and Technology Academy (HSTA) encourages underrepresented and underserved high school students from rural West Virginia to pursue degrees in Health Sciences (HS) and STEM majors in hopes of increasing the number of health practitioners and advocates in the medically underserved communities of WV. The program engages 9^{th}-12^{th} graders in community based research projects that tackle community identified health disparities issues through the guidance of Community Research Associates (CRAs). CRAs are knowledge brokers with backgrounds in high school science education and public health, an understanding of experimental design/statistics, an ability to translate scientific information and CBPR making it relevant and comprehensible to youth, and an ability to facilitate a multi-directional flow of communication linking HSTA, WV communities and academic researchers.

CRAs became a part of the HSTA program in 2011 and joined the CTSI Knowledge Broker Infrastructure in 2012. CRAs live in communities across WV that allow unique opportunities to access hard to reach communities. They recruit research participants, implement study design, and assist with collecting data, as well as disseminate and translate knowledge to communities/researchers. They are able to empower future generations of HS and STEM leaders to be vectors of change in their own communities. Results will display highlights of successful collaborations, summaries of projects, and dissemination procedures from the past five years. Data will include overall recruitment numbers, highlights of CRAs, dissemination efforts, and student project data. In conclusion, this poster will discuss this unique infrastructure of CRAs and their impact on community research throughout WV.

Poster Number: 28

Category: Early Stage Investigator

TeleHealth Electronic Monitoring to reduce Post Discharge Complications and Surgical Site Infections Following Arterial Revascularization with Groin Incision (Early Results)

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INTRODUCTION: Post-surgical discharge complications result in increased hospital readmissions, cost, and patient dissatisfaction. Telehealth technology to monitor patients, especially those in geographically isolated areas, should reduce post-operative complications, improve health and financial outcomes.

OBJECTIVE: The primary objective is to compare outcomes between patients that receive Telehealth electronic monitoring (THEM) to those with routine discharge instructions and no monitoring, Standard of Care.

METHODS: This is a prospective randomized study of vascular surgery patients with groin incisions. THEM patients receive a tablet and home monitoring devices that transmit information to care managers. Monitoring tools include image capture, weight scales, blood pressure cuffs, thermometers and oxygen saturation monitors. Care managers use the TeleMed 2020 Enform™ platform to review alerts, real-time patient data, and dialogue with the care team.

RESULTS: To-date, 30+ patients were screened with 30% enrollment and no hospital readmissions for either group. Based on a wound image captured and shared by the care team, an antibiotic was prescribed, which likely averted hospital visit or readmission. On average there were 2.0 system alerts/per-patient-day generated. The majority were for infection issues (38%), pain management (19%), blood pressure (22%), and emotional concerns (10%). All THEM patients (100%) reported that information provided to their care manager via Enform™ “Definitely” enriched the conversation or quality of care provided, and rated the platform easy-to-use, a score of 4.7 (5-point scale).

CONCLUSION: First indication is that THEM patients embrace telehealth technology and take advantage of increased access to health care professionals. Telehealth merges remotely generated information with care manager interaction.

Poster Number: 29

Category: Student / Resident / Fellow

BMI- and Gender-specific Increase of MAP2K3/p38 Activity in Human Cardiac Hypertrophy

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The role of p38 mitogen-activated protein kinase signaling in cardiac hypertrophy has been controversial. While *in vitro* studies found a positive correlation of increased MAPK signaling activity and cardiomyocyte hypertrophy, *in vivo* studies showed a negative association. Additionally, it is unknown if the role of p38 MAPK in hypertrophy is affected by gender or body mass index (BMI). We hypothesized modulation of p38 activity in hypertrophy by gender and BMI.

Human heart samples were grouped into left ventricular hypertrophy (LVH) and non-failing heart controls (NF). RNA-Seq was used to obtain gene expression and immunoblots were used to examine protein expression of MAP2K3 and p38.

MAP2K3 gene expression levels were increased by 134% in obese males with LVH compared to NF (Fragments Per Kilobase of transcript per Million mapped reads: LVH = 19.2±3.5; NF = 8.2±1.9, n=3, $p<0.05$). MAP2K3 protein expression was five-fold higher in LVH (1.24±0.20, n=9) than in non-LVH (0.25±0.03, n=12) ($p<0.0001$).

p38 isoform gene expression profiles and total protein expression levels were similar between LVH and NF ($p>0.05$). p38 activation was raised in overweight/obese versus lean males (pp38/p38 ratio: M_BMI>25 = 0.63 ± 0.03 (n=7), M_BMI<25 = 0.41 ± 0.12 (n=3), $p<0.05$). For BMI>25, levels of activated p38 were higher in male (0.63 ± 0.03, n=7) than in female (0.08 ± 0.01, n=3) ($p<0.0001$).

In conclusions, p38 activity was modulated by sex and BMI. An increased protein expression of MAP2K3 and activity of p38 in cardiac hypertrophy was positively associated with male obese human hearts.

Poster Number: 30

Category: Early Stage Investigator

Temporal and Functional Dynamics of Peripheral Leukocytes Following Acute Ischemic Stroke

Ashley B. Petrone, Lindsey Mosmiller, Kelsey Steele, and Dana E. King

Introduction: Despite the global burden of acute ischemic stroke (AIS), only four percent of AIS patients are candidates to receive tissue plasminogen activator, the only FDA-approved for AIS. One recent strategy has been targeting the peripheral immune response, because while this immune response is critical in controlling local brain damage and facilitating repair post-AIS, an excessive or improper response may be detrimental. The purpose of this study is to characterize the acute peripheral immune response to AIS in patients with good and poor outcome.

Methods: We performed a retrospective analysis of n=66 AIS patients admitted to Ruby Memorial Hospital from 2012-2015. WBC differentials were performed at 0-24 hours, 24-48 hours, 48-96 hours, and within 24 hours of hospital discharge. Absolute neutrophil and lymphocyte counts were measured at each time point. AIS patients were stratified using the Modified Rankin Scale (MRS) at discharge. Good outcome was defined as MRS 0-2, and poor outcome was MRS 3-6.

Results: Neutrophil counts were significantly elevated at 0-24 hours and at discharge in the poor outcome group compared to good outcome ($p<0.05$). Total lymphocyte counts were significantly decreased at 0-24 hours and 48-96 hours in the poor outcome group compared to good outcome ($p<0.05$).

Conclusion: Our data that suggests that AIS patients with good outcome have a distinct temporal peripheral immune response to AIS and a deviation from this pattern may contribute to poor outcome. These results may provide a strong conceptual framework for the continued development of immunomodulatory therapeutics in AIS.

Poster Number: 31

Category: Early Stage Investigator

Prognostic Utility of Alkaline Phosphatase Isoenzyme Levels in Emergency Department Sepsis Admissions at Ruby Memorial Hospital

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BACKGROUND: Sepsis is characterized by an overwhelming immune response to infection leading to a “cytokine storm” of inflammatory mediators. This “cytokine storm” can disrupt tissue barriers, increase thrombus formation, and shift the body into a paradoxical immunosuppressive state. As a result, multi-organ failure, cognitive dysfunction, and recurrent infections may develop, further increasing morbi dity and mortality. Emerging studies suggest that alkaline phosphatase (AP) levels may be instrumental in maintaining tissue barriers throughout the body. It remains unclear if AP levels correlates with sepsis severity or mortality, or if it may be used as a clinical biomarker. Such a linkage would support further research for AP-targeted sepsis therapies. We assessed the impact of AP levels on patients presenting to the Emergency Department (ED). We hypothesized that one or more AP isoenzyme activity levels, but not total serum AP activity levels, would be elevated in patients who present in the ED with probable sepsis.

METHODS: We conducted a prospective observational study. ED patients were eligible for inclusion if: (1) age ≥ 18 years, (2) diagnosed with sepsis (≥ 2 SIRS + infection), (3) provided informed consent. Patients with acute or chronic hepatitis were excluded.

RESULTS: Twenty-one patients were enrolled; sepsis (n=17), controls (n=6). AP liver 2 isoenzyme levels were significantly elevated in the sepsis group (p=0.008). Additional enrollment is ongoing.

CONCLUSION: This result supports our working hypothesis and provides novel mechanistic insights that specific AP isoenzymes may serve a protective role in host defense, tissue repair, and resolution of inflammation during sepsis.

Poster Number: 32

Category: Senior Investigator

Increase in Alcohol-Related Motor Vehicle Crashes after the Opening of a Casino with 24 Hour Alcohol Sales.

G.S. Smith, Department of Epidemiology, West Virginia University P. Dischinger, Department of Epidemiology, University of Maryland. A. Johnson, S. Ho, T. Kerns, National Study Center for Trauma & EMS, University of Maryland. K. Tracy, Department of Epidemiology, University of Maryland.

Little is known regarding the impact of introducing casino gambling with its accompanying 24 hour alcohol sales on traffic crashes although restricting hours-of-sale does decrease hazardous consumption.

Methods: We evaluated traffic crashes 18 months before and after Maryland's largest casino opened using data linkage of multiple databases. Police reported crash locations were mapped within concentric radii of 1 and 5 miles of the casino. Drivers' zip-code and state of residence was obtained from crash databases and linkage with Driver's License files. Alcohol-relatedness of crashes was based on police reports.

Results: Crashes occurring within 1 mile of the casino increased 34.2% after opening the casino, only 7.0% within 5 miles while county and statewide crashes showed little change. Friday to Sunday night crashes increased 77% within one mile but only 18% within a five mile radius. Night-time crashes (9pm-5am) increased 87% within 1 mile while impaired driving crashes increased 58%. Single vehicle crashes increased 23% within 1 mile, and drivers impaired by alcohol increased by 82% with little change in 5 mile crashes. The largest increase in crashes was among those living near the casino and drivers from Virginia (state without casino gambling.

Conclusions: Indicators associated with alcohol-related crashes increased significantly following opening of the casino, with nighttime, single vehicle and impaired crashes increasing much more near the casino than further away. Our results indicate that the legalization of casino gambling in combination with 24 hour liquor licenses at gambling outlets has significantly increased alcohol-related crashes proximal to the casino.

Poster Number: 33

Category: Early Stage Investigator

Substance Use Among College Freshman: The College Student Transition Study

Turiano, Nicholas--PI
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The transition to college is a key developmental turning point in late adolescence because many individuals experiment with substances such as alcohol, tobacco, and illicit/prescription drugs. Thus, the aim of the College Student Transition Study is to longitudinally examine how substance use behaviors change among high school seniors transitioning into their first year of college. In July 2016, a baseline assessment was conducted in which 580 participants (incoming West Virginia University freshman) consented to the study (out of approximately 5,000 incoming students). Assessments included family background information, high school academic performance, personality, social relationships, health, and specific details about alcohol use, tobacco use, drug use, and sexual behavior. These participants were assessed again during their first semester of academic enrollment at West Virginia University in September 2016. Psychological, social, and behavioral functioning were assessed again at this wave. There are three remaining assessments scheduled for this pilot project, which will end in May 2017. There are two main goals: 1) We will examine the trajectories of substance use behavior over time so distinct “types” of users can be identified. Next, we will use baseline characteristics to predict these typologies. 2) We will examine how substance use behavioral patterns influence health, well-being, social relationships, academic performance, and retention rates over time. An overview of the baseline data already collected for this pilot project will be presented as well as an overview of study goals.

Poster Number: 34

Category: Student/ Resident / Fellow

Adaptive neural mechanisms in individuals with autism when processing multisensory vs. unisensory real-world stimuli

Paula Webster, Dept. of Neurobiology & Anatomy and Center for Advanced Imaging (CAI) Chris Frum, Dept. of Neurobiology & Anatomy and Center for Advanced Imaging (CAI) Amy Kurkowski-Burt, Dept. of Occupational Therapy Chris Bauer, Dept. of Psychology and Center for Advanced Imaging (CAI) Kathryn Baker, Dept. of Neurobiology & Anatomy Margeaux Gray, Dept. of Psychology Nadia Mardmomen, Dept. of Biology Alyssa Chafin, Dept. of Exercise Physiology

Sensory processing dysfunction is a pervasive aspect of autism in which every-day sounds, sights, smells, etc., can be overwhelming or don't register in the brain at the same level as individuals without autism. Often this impacts an individual's ability to participate in every-day activities such as going to the grocery store or sitting in a classroom. The world is a multisensory environment in which our brains must process multiple types of sensory inputs simultaneously. Precise integration of the senses facilitates Improved reaction time and accuracy. While individuals with autism do integrate multiple sensory inputs, they do so over a wider timeframe. Most studies investigating sensory integration in autism utilize simple, artificial stimuli such as pure tones and simple shapes. Little is known about sensory integration in this population in regards to processing real-world, socially complex information. This study uses functional magnetic resonance imaging (fMRI) to investigate differences in sensory integration of complex audiovisual information between individuals with autism and their peers without autism. Participants watch a video of someone bouncing a basketball and press a button when they perceive the ball to hit the floor. Sometimes the video has synchronous audio (multisensory) and sometimes there is no auditory information (unisensory, visual only task). Individuals with autism are utilizing different brain regions to perform these tasks, which may reflect adaptive cortical mechanisms developed as a result of their wider temporal binding window. In addition, unlike previous results showing no significant difference for individuals with autism when auditory information is added to a visual search task, using more socially relevant stimuli demonstrates a decrease in accuracy for this group. The fMRI results add to our understanding of adaptive cortical development in individuals with high-functioning autism while the behavioral data is significant to considerations regarding teaching and workplace environments.

Poster Number: 35

Category: Student/ Resident / Fellow

Examining the Prognostic Significance of Select Inflammatory Cytokines Using an Open-Source Genomics Platform Reveals Novel Expression Patterns Across Breast Carcinoma Subtypes

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Introduction: Given the high rates of obesity and aggressive breast cancers in rural Appalachia, it is paramount to understand how adipose supports the tumor microenvironment. We previously found that adipose-derived stem cells cultured with triple-negative tumor cells promote the expression of pro-inflammatory cytokines. This finding is significant as it could explain, in part, how obesity contributes to worse outcomes in breast cancer.

Methods: Cytokines and growth factors were measured in co-cultures of adipose stromal cells and MDA-MB-231 lines. To validate their clinical significance, we compared cytokine mRNA expression profiles using the Cancer Genome Atlas (n = 1,005) and evaluated them for indices of tumor progression.

Results: FGF7 and CCL5 overexpression was evident in *in vitro* arrays and showed a significant impact on survival within TCGA data. FGF7, CCL5, CCL2, IL6, and IL6R were analyzed for expression across molecular subtypes of breast cancer. IL6R, CCL5, and CCL2 expression varied significantly, with mean expression highest in triple-negative tumors. After dichotomizing the samples for estrogen receptor status, IL6R, CCL5, and CCL2 showed significantly higher mean expression in ER negative tumors. Ingenuity Pathway Analysis indicated IL6, IL6R, CCL5, and CCL2, but not FGF7, cooperate through many pathways to promote tumor progression.

Conclusions: Genomic data analysis support *in vitro* findings that IL6R, CCL5, and CCL2 overexpression may predict a worse prognosis in breast cancer. For adipose-driven, hormone receptor negative breast tumors commonly found in our Appalachian population, these cytokines and growth factors could serve as novel therapeutic targets. (*Supported by NIH P20GM103434 and NIGMS U54GM104942*)

Poster Number: 36

Category: Early Stage Investigator

The Development and Feasibility of a Pharmacist-Delivered Opioid Intervention in the Emergency Department

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Objectives: Develop a brief intervention and assess the feasibility of a pharmacist-delivered education on opioid safety and overdose prevention in the emergency department.

Methods: A convenience sample of patients (n=100) approached between May and June 2016 at a single emergency department located in the Midwest.

Results: The intervention included scripted counseling to be delivered in-person and two educational brochures. The counseling took approximately five minutes and only two patients refused the counseling. All of the patients were satisfied with the intervention and 97.4% reported that the counseling improved their knowledge of opioid side effects. The majority of patients thought that their own risk of addiction was significantly less than the general public's risk of addiction when taking opioids.

Conclusion: This study provides preliminary evidenced that pharmacy interns or pharmacists are able to deliver opioid safety and overdose education in the ED.