NIH / Research Enhancement
Building Infrastructure Leading to Diversity

REBUILDetroit

Marygrove College
University of Detroit Mercy
Wayne State University

Summer Research Experience
Poster Session Abstracts
July 26, 2016
Wayne State University
McGregor Memorial
Conference Center
Detroit, MI

Research reported in these presentations was supported by the National Institutes of Health under Award Numbers GM118981, GM118982 and GM118983. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Poster Presentations

1. A Novel Strategy to Inhibit Drug-Resistant Non-Small Cell Lung Cancer Cells

Madeleine E. Reardon[1], Vino T. Cheriyan[2], and Arun K. Rishi[23]

1. ReBUILDetroit, University of Detroit Mercy
2. Division of Hematology and Oncology, Karmanos Cancer Institute,
3. Cancer Biology Program, Wayne State University

Non-small cell lung cancers (NSCLC) account for 85% of all lung cancers and are a very heterogeneous disease. Despite development of number of therapies, the prognosis remains poor due in part to emergence of resistant disease. CARP-1 Functional Mimetic (CFM) compounds bind with CARP-1, stimulate CARP-1 expression, and apoptosis. Here we tested whether CFM analog 4.16 inhibits growth of NSCLC cells that express mutant Epidermal Growth Factor Receptor (EGFR) Tyrosine Kinase (RTK), and the tyrosine kinase inhibitor (TKI)-resistant NSCLC cells. We utilized NSCLC H1975 cells that harbor T790M mutation in the EGFR and are resistant to first and second generation TKIs such as Gefitinib and Erlotinib, while are responsive to the third generation TKI Rociletinib. We next generated multiple, independent sublines of H1975 cells that were grown in chronic presence of Rociletinib. MTT-based cell viability assays established resistance of H1975 sublines to Rociletinib, and Western blots indicated elevated wild type EGFR. On this basis, we tested the ability of TKI Gefitinib that targets wild type EGFR as a single agent as well as in combination with CFM 4.16 to inhibit Rociletinib-resistant NSCLC cells. Our data revealed that although CFM-4.16 or Gefitinib inhibited growth of Rociletinib-resistant cells, their growth inhibition by a combination of both the agents was similar to that noted for the cells that were treated with CFM-4.16 alone. Therefore, our preliminary findings suggest CFM 4.16 alone or in combination with TKIs could be a suitable strategy to inhibit resistant NSCLCs with mutant EGFRs.

2. An Exploration in The Graduate Admissions Process: Gender Bias in Faculty Letters of Reference

Jennifer Nava[1] and Annmarie Cano[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Psychology, Wayne State University

Much of the research looking at implicit gender bias in letters of reference has been for faculty positions in STEM related fields, however the purpose of this study is to examine gender bias in letters of reference being used for the graduate admissions process. We will test whether gender differences are consistent across disciplines (e.g., STEM, social and behavioral sciences), race, and age. We will also attempt to examine letter writers' gender as it pertains to language usage and potential bias. Letters of reference will be de-identified and then coded through the use of the text analysis application Linguistic Inquiry and Word Count (LIWC). Through LIWC the letters will be analyzed word for word and placed into one of eighty word categories after being compared to the pre-existing internal dictionary (Pennebaker et al., 2001). After coding, all data will be entered into a de-identified database that will not be linked to a master list. Currently the present study is under review and pending approval from the Institutional Review Board (IRB). It is hypothesized that, in comparison to male applicants, letters for female applicants will be shorter, include more personal attributes and fewer performance attributes as well as containing more references to weaknesses. The current study will serve as a means of achieving equitable access throughout the graduate admissions process.

3. Are levels of perceived stress lower in African-American pregnant women who have a close relationship with the father of their baby?

Relicious Eboh[1] and Dawn Misra[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Family Medicine and Public Health Sciences, Wayne State University School of Medicine

African-American women experience a disproportionately high rate of stress-related health problems, including adverse birth outcomes. A few studies have shown that paternal support could moderate or alleviate the stress on pregnant women, in which in turn may decrease a woman's chance of having a poor birth outcome. We examined the levels of perceived stress in African-American pregnant women in relation to their relationship to the father of the baby in a cohort study of preterm birth in Black women in Southfield, Michigan (N=1411; 71% response rate). Data about three time periods (birth, age 18, prepregnancy) were obtained from maternal interview and medical record abstraction. Levels of perceived stress was measured by Cohen's Perceived Stress Scale. The instrument contains 14 items on a 5-point scale (1=never to 5=very often) that ask about feelings and thoughts during the prior month (e.g. "felt upset," "stressed out"). The status of the mother's relationship with the father of the baby before and after pregnancy was measured using a 5-point Likert Scale (1= very close to 5=very cold). Women who reported to have a close relationship with the father of the baby before and after pregnancy experienced less stress than women with a cold relationship before and after pregnancy. Our results suggest that paternal involvement from the father of the baby before and after pregnancy could minimize a women's stress levels to ensure a healthy, full-term birth.

4. Child RSA and Attachment Behaviors as Predictors of Family Cohesion during Shared Book Reading Task

Scotti Smith[1], Elizabeth Moak[2], and Marjorie Beeghly[3]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. ReBUILDetroit, University of Detroit Mercy
3. Department of Psychology, Wayne State University

The purpose of the study was to look at the role that child baseline Respiratory Sinus Arrhythmia (RSA) plays in triadic family interactions during a shared book reading task, focusing on a population of 85 triads (mother-secondary caregiver-toddler) composed mostly of low income, minority families. Prior research has shown that higher Child RSA can help protect a child from being negatively affected from outside stressors during their development, such as maternal depression, which was evaluated in a 2008 study conducted by Alysia Y. Blandon. Analyses were based on data obtained from the TEDY study (E. Bocknek, PI), including Child RSA and mother-reported child attachment behavior, as well as ratings of family cohesion during shared book reading. Both Child RSA and attachment behavior were significantly positively correlated with family cohesion. There were no associations found between the sample demographics and the study variables. However, when Child RSA and attachment behavior were looked at together in a hierarchical regression, only child attachment behavior remained statistically significant in predicting the family cohesion outcome. This suggests that child attachment behavior is a stronger predictor than Child RSA as to how cohesive the triad will be in the shared book reading task.

5. Child Sex, Externalizing Behavior, and Attachment as Predictors of Family Negativity During a Shared Book Reading Task

Elizabeth B. Moak[1], Scotti D. Smith[2] and Marjorie Beeghly[3]

1. ReBUILDetroit, University of Detroit Mercy
2. President M. Roy Wilson BUILD Scholars Program, Wayne State University
3. Department of Psychology, Wayne State University

The primary aim of this study was to evaluate whether child male sex, child externalizing behavior, and child attachment behavior, assessed at age two years, were significant predictors of family negativity observed during a shared book reading task in a low-income, urban sample. To evaluate potential covariates, associations of the study variables with demographic factors (i.e., parental marital status, education, family income, and residential status of the secondary caregiver) were also evaluated.

It was hypothesized that child male sex and externalizing behavior would each be significant predictors of family negativity during the shared book reading task with a sample of 85 mother-secondary caregiver-toddler triads at the age of 2. It was also hypothesized that child attachment behavior would be negatively associated with family negativity, even after variance attributed to male sex and child externalizing behavior was accounted for. We found that although child sex, externalizing behavior and attachment all factored into the overall family negativity level, there were a lot of outlying variables not calculated into this project.

6. Readiness of Newly Licensed Registered Nurses to Screen for Intimate Partner Violence

Zia Muntford[1], Emily Gorkiewicz[1], Omni Sullivan[2], and Theresa Wyatt[3]

1. ReBUILDetroit, University of Detroit Mercy
2. President M. Roy Wilson BUILD Scholars Program, Wayne State University
3. McAuley School of Nursing, University of Detroit Mercy

Intimate partner violence is a serious health and social problem in the United States, causing both short and long term consequences in which could be detrimental to the victim. Screening rates for intimate partner violence are inconsistent and low. This qualitative grounded theory study used national sample of newly licensed registered nurses (NLRNs) to conduct individual interviews. The interviews focused on (a) the perceived beliefs and attitudes of NLRNs regarding screening for DV, (b) how these perceived beliefs are influenced by pre-licensure education and additional training in the workplace, and (c) how and why these NLRNs would use existing pre-selected screening tools for domestic violence. Seventeen NLRNs were interviewed. Each BUILD student coded three manuscripts using grounded theory with guidance from the principal investigator. Four themes were identified: taboo, intuition, preparedness, and comfort level. Many NLRNs admitted they weren't educated enough on domestic violence or how to screen nor were aware that screening tools e available beyond "Do you feel safe". All participants were strong in their suggestions regarding educational needs that included role play, hands on learning and simulation. Also reeducation, yearly, in this area would be highly recommended for all nurses that work directly with patients.

7. Decorporation: Building Blocks for Chelants

Bianca M. Jones[1], Nolan Kirkman[2], and Klaus J. Freidrich[3]

1. ReBUILDetroit, University of Detroit Mercy
2. University of Detroit Jesuit High School
3. Department of Chemistry and Biochemistry, University of Detroit Mercy

With recent controversy surrounding heavy metal pollution and the health effects of radioactive substances it is of utmost importance to synthetize a compound that effectively and safely removes hazardous metallic ions from the human body. Chronic and acute exposure to radionuclides such as americium and thorium can produce serious biological effects such as DNA mutation, the ionization of vital molecules and the development of cancerous cells. The extent of the radiation damage depends on the proximity of the radiation source and whether the exposure results from external and/or internal contamination. Removal of the transition metals and actinides is through a process called decorporation therapy. Our research explores the coupling patterns of amino acid-based DTPA derivatives with metal ions to design an orally available pharmaceutical agent. Lipophilicity, complexing capability and metabolism of these chelants are considered in the design of the drug candidates.

8. Disruptions to the Relative Environment Associated with a Decrease in Overall Running Wheel Activity of Rodents

Omar Ismail[1] and Patrick J. Mueller[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. Department of Physiology, Wayne State University School of Medicine

The importance of keeping conditions stable in an experiment cannot be understated. In experiments involving rats that voluntarily use running wheels, parameters such as room temperature; ambient noise; room entries by non-research personnel; and lighting may all influence the running wheel activity of rodents. We hypothesized that any disturbances in the relative environment would significantly reduce the running wheel activity of rodents. Typically, the Department of Laboratory Animal Resources (DLAR) facility controls all factors related to the rodents; however, during a necessary water and cooling shutdown, air-conditioning (AC) units were placed by non-research personnel in our rat room for two days. Despite the presence of AC units, maximum room temperature increased from (78˚F to 81˚F) while both total running distance (4.18±1.31 Km to 1.4±0.44 Km) and total running duration (120.5±32.3 min to 44.5±11.7 min) significantly decreased ($p<0.05$ for both, $n=6$). Average speed did not change significantly (52.5±4.27 m/mm to 53.1±3.79 m/mm). As predicted, the change in the relative environment had a significant change on the running wheel activity of the rodents. These data suggest that disruptions caused by increased room entries, ambient noise, and temperature are associated with the decreased running wheel activity of rodents. Moving forward, it would be interesting to see which parameter is directly associated with the decrease in running wheel activity.

9. Effects of Paternal Asthma on Birth Weight

Leena Abbas[1] and Dawn Misra[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. Department of Family Medicine and Public Health Sciences, Wayne State University School of Medicine

The birth weight of an infant is an essential variable to take notice of during the birth of any child. Studies have shown that birth weight is strongly associated with physical complications in a child. Although there have been multiple studies on this topic, most studies focus on maternal influences on the birth weight of an infant. Paternal influences on birth weight is a novel field of study, as only a handful of papers have been published about this topic. In this study, we are focusing on the effects of paternal asthma on birth weight. We used a subsample of data derived from the LIFE cohort study of preterm birth among black women and the father of their babies in Southfield Michigan (71% response rate), that occurred during June 2009 to December 2011. The medical record was abstracted to obtain the child's birth. SPSS statistical software was used. The average birth weight of the subsample (n=26 mother-father pairs) with paternal data was 3036 grams. Of the 17 fathers with complete data, there were 3 who reported having asthma. We conducted an independent-samples t-test comparing birth weight by asthma status in the father. There was a large difference with an average reduction of 118.8 grams associated with paternal asthma. The t-test shows that there is no statistical difference but this may be due to the sample size being so small (n=27). In future studies, we are hoping to have a larger sample size, in which we can more accurately describe the relationship between paternal asthma and birth weight.

10. Examination of Mineral Cosmetics via Energy Dispersive X-Ray Fluorescence Spectroscopy

Diamond Stokes[1], Sara Thomas[2], Grace Nguyen[2], Mark Benvenuto[2], Elizabeth Roberts-Kirchhoff[2]

1. ReBUILDetroit, Marygrove College,
2. Department of Chemistry and Biochemisty, University of Detroit Mercy

The sale and use of cosmetics is an enormous business throughout the world. The Federal Food, Drug, and Cosmetic Act (FD&C) gives authority of the U.S. Food and Drug Administration (FDA) to oversee the safety of food, drugs, and cosmetics. The FDA does not approve cosmetic products in the same way as it monitors food and food supplements. Thus, what can be included in a make-up is much less tightly controlled than what can be included in a food or food supplement. This study examines the components of powdered cosmetics including foundation and eye shadows that are sometimes referred to as mineral make-ups through the use of energy dispersive X-ray fluorescence spectroscopy (EDXRF) to determine what elements are present.

11. Examining Atrazine Accumulation and Histological Changes in the Hepatopancreas of Crayfish Post-Exposure

Kathrine Yacoo[1], Daniel J. Dayfield[2], Danielle N. Maxwell[3], Kaldoun M. Barawi[4], K. Abraham[4], Kendra R. Evans[3], Rachelle M. Belanger[4], Elizabeth S. Roberts-Kirchhoff[3]

1. ReBUILDetroit, University of Detroit Mercy,
2. ReBUILDetroit, Marygrove College
3. Department of Chemistry and Biology, University of Detroit Mercy
4. Department of Biology, University of Detroit Mercy,

Many herbicides, including atrazine (ATR), are known to have long-term adverse effects on aquatic organisms. It is of interest to quantify how ATR accumulates in aquatic organisms. This was done by developing a method to quantify the amount of ATR in the hepatopancreas of the virile crayfish (Orconectes virilis). Crayfish were treated at different environmentally-relevant (80 and 300 ppb) and control concentrations 0 ppb (negative control) and 1000 ppb ATR (positive control) for 15 days. Following exposure, hepatopancreas tissue was collected. ATR was extracted from the hepatopancreas using a quick, easy, cheap, and effective (QuEChERS) method. Following the extraction, the ATR recovery was analyzed using liquid chromatography-mass spectroscopy (LC-MS). The LC-MS method allows for the analysis of ATR and its metabolites. A standard solution of ATR was prepared and analyzed using LC-MS. The amount of ATR in the tissue was determined by using the standard curve of ATR (range - 5-5000 ppb). Additionally, histological changes in the hepatopancreas, including increased vacuolization, were visualized following sectioning and staining with hematoxylin and eosin (H&E).

12. Fe2P Nanoparticle Assemblies for Potential Magnetic Refrigeration

Mikaylah Poli[1], Malsha Hettiarachchi[2], Stephanie Brock[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University,
2. Department of Chemistry, Wayne State University

Magnetic refrigeration (MR) technology has attracted scientific and public attention due to its level of efficiency and environmental friendliness. Incredibly, MR technology is able to reach much lower temperatures than conventional vapor compression, while simultaneously being less harmful to the environment. Magnetic refrigeration technologies rely on what is known as the magnocaloric effect (MCE), a process in which magnetic materials absorb or expel heat by magnetizing or demagnetizing. Fe2P is the primary focus because Fe2P and related phases are promising MR materials whose MCE characteristics can be improved by nanostructuring. In our project, we seek to prepare discrete nanorods of Fe2P and assemble them into porous nanostructures. Their magnetic properties will be studied as a function of nanoparticle size and nanostructure density. To make these Fe2P nanoparticles, we combined tri-n-octylphosphine (TOP) and Fe(CO)5 in the presence of octadecene and oleylamine as the solvent and stabilizing agent, respectively. The solution was then heated at high temperatures (330-350°C) for various lengths of time to produce rod-shaped nanoparticles, which will later be subject to sol-gel formation. Incorporating these Fe2P nanoparticles into a gel network is further expected to fine tune the properties with respect to effective MR technology. This research focuses on the nanoscale because narrowing down the size to nanoscale is expected to optimize MCE properties and pave the way for an effective MR technology.

13. Gender Differences in Emotional Expression after Pain Intervention

Nailah Henry[1] and Annmarie Cano[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. Department of Chemistry, Wayne State University

Health professionals across disciplines must understand pain management in order to properly care for their patients. In addition, patients must understand how to properly communicate their pain and learn what methods of pain management works best for them in order to heal effectively. Conversations that couples have about health and pain may provide a perspective as to how men and women report and cope with their pain and how to approach treatment. Using post treatment interviews from a six-week couples pain intervention at Wayne State University, I investigated transcriptions of interviews by using the Linguistic Inquiry Word Count (LIWC), a software program that analyzes the frequencies of self-focused negative or positive words each partner used. This research will show the extent to which men and women vary in their communication about their health (specifically their pain) so that health professionals can consider whether to shift their approach based on their patient's gender.

14. Health Professionals as Scientists: A Cultural Perspective

Mary-Jacqueline Muli[1] and Molly McClelland[2]

1. ReBUILDetroit, University of Detroit Mercy
2. McAuley School of Nursing, University of Detroit Mercy

Introduction: Media has always had a significant impact on how the public makes sense of and understands the world. The way stories, entertainment and news topics are narrated as well as the vivid pictures and images that are used in narratives shape people perspectives. Nurses comprise the largest number of health care professionals, are trained in the science disciplines and at minimum have an understanding of research yet are often perceived as incompetent, hand-maids to doctors or as sexual objects. This study attempts to understand this phenomenon.

Objective: The purpose of this study was to understand the perspectives of Kenyan and Canadian participants regarding nurses as scientific and members of the STEM professions.

Method: Approval was obtained from UDM's institutional review board (IRB) prior to beginning the study. Convenience sampling was implemented. A survey was sent electronically to any willing adult participant living in the United States who identified themselves as belonging to the Kenyan or Canadian cultures. Pictures of people ranging in age, gender, ethnicity and attire were shown to the participants. The participants rated the likelihood that those individuals in the pictures were scientists using a 5 point Likert type scale.

Results: 142 participants completed the survey. 22 were self-identified as Kenyan and 4 were Canadian. The results were analyzed using Survey Monkey Analysis reporting. The Kenyans mostly viewed the nurse professionals as scientists but more often viewed biologists and pharmacists as scientists. The Canadians viewed health care professionals as scientists more often than not, and also viewed nurse professionals as scientists more often, but not as often as the biologists and pharmacists. The pictures of nurses in the survey were perceived with a high likelihood that they were scientists by both Kenyans and Canadians but those pictures of people in lab attire and lab paraphernalia were perceived as definitely being scientists

Conclusion: Perception of the science of nursing is considered, however based on this study, there seems to be room for persuasion in encouraging the public to view nurses as scientists.

15. Histochemical and Microbiological Delineation of the Gastrointestinal Tract of the Madagascar Roach, Gromphaorhina portentosa.

Carrington Goldsmith[1], Gregory M. Grabowski[2], and Lance Shultz[2]

1. ReBUILDetroit, Marygrove College,
2. Department of Biology, University of Detroit Mercy

In order to identify the organs and regions of the Madagascar hissing cockroach gastrointestinal tract, we used a histochemical approach which included staining for endocrine cells. In addition, we also tested the pH levels throughout the gastrointestinal tract. Using these tests, we were able to posit the function of different regions of the cockroach gastrointestinal tract. Predictably, we note that many cockroach features seem to be analogous to mammals, like humans. We were also interested in making observations about the cockroach microbiome, the native microorganisms that are found within the cockroach. As the cockroach gastrointestinal tract was analogous to the mammalian digestive system, we were curious if a human pathogen, E. coli, could colonize the cockroach. Out of the eight recorded portions within the gastrointestinal tract, the crop, comparable with the mammalian stomach, was not colonized by E. coli. The other seven portions were, however, colonized. Further we wanted to test whether the behavior of the bacteria isolated from the cockroaches was different than predigested bacteria. In our swim plate assay and in our preliminary biofilm assays, our findings suggest that there is no difference in the populations of bacteria.

16. Hybrid Thin Films of CdS/Ni2P by Sol-Gel Assembly and Their Application in Visible Light Induced Hydrogen Reduction

Kody Whisnant[1], Da Li[2], and Stephanie Brock[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. Department of Chemistry, Wayne State University

Photocatalytic evolution of hydrogen from water utilizing visible light in a noble-metal-free system has attracted much attention recently because it can address global demands for a clean energy source and the negative effects of CO2 emission on the environment. Ni2P nanoparticles have been shown to be good electrocatalysts for hydrogen evolution from water, but they are not photoactive. In this work, Ni2P will be combined with CdS nanoparticles, which are visible light activated semiconductors, to make a hybrid catalyst. CdS and Ni2P nanoparticles are synthesized through a solution-phase arrested precipitation reaction and put through an oxidative gelation process to generate hybrid sol-gel films. Sol-gel methods are applied to prepare the films in order to improve interparticle coupling and suppress non-radiative recombination resulting from structural defects. Transmission electron microscope (TEM) images are used to monitor the gelation process and the photocurrent generated from the film is measured. Preliminary data shows that the hybrid CdS/Ni2P sol-gel film has a better photo response than the CdS film. This system enables reduction of protons in water through the use of sol-gel hybrid films that contain no precious metals, and thus has potential for efficient photocatalytic hydrogen evolution.

17. Investigating the occurrence and variation of programmed cell death among yeast species

Efren Munoz[1], Alejandro Lozano[1] and Weilong Hao[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. Department of Biological Science, Wayne State University

Programmed cell death, or apoptosis, is a key molecular process in multi-cellular organisms. For instance, the abnormality of apoptosis can lead to the development of cancers. Recently, there is fast growing evidence that programmed cell death occurs in single-cellular organisms. In this study, we sought to address two questions, whether growth medium conditions impact programmed cell death and whether closely related species undergo programmed cell death in a similar way by responding environmental changes between complete medium and glycerol medium. We found that the ratios of live cells over dead cells are very similar across the analyzed the yeast species. We did observe that the ratio of dead cells was higher in H.va species as time continued. During the course of the study, we noticed one strain in the species S.lu grew strikingly faster than any other strains in the same species. To verify its identification, we sequenced its barcode ITS region. The results showed that the S.lu 733 strain does not belong the species of S.lu, but instead, it belongs to the species of K.ma. This further suggests that different species have different survival responses and can have very different levels of program cell death.

18. Is Integrative Priming Prospective?

Anna M. Julien[1] and Lara L. Jones[2]

1. ReBUILDetroit, University of Detroit Mercy,
2. Department of Psychology, Wayne State University

Relational integration refers to the process of inferring a relation between two nouns in which the first noun describes a subtype of the second noun. Integrative priming occurs when word recognition of the second noun or target, (party) is faster in a lexical decision task (LDT) following a related first noun or prime (pool) in comparison to an unrelated prime (phone). Integrative priming can happen prospectively which means that the target word is anticipated prior to presentation. Or it can happen retrospectively which means that the target word is still facilitated but only after its presentation. The purpose of this ongoing project is to investigate the extent to which integrative priming occurs prospectively. In a continuous LDT, participants decide whether each prime (beach), target (ball), or letter string (frup) is a real word. Consequently, prime and target pairings are not explicit and thus any facilitation of the target would be prospective. Therefore, we used a continuous LDT in our study to determine whether integrative priming is prospective. In Experiment 1, equivalent priming was obtained for integrative pairs (peach – pie), strongly associated integrative pairs (pumpkin – pie), and strongly associated non-integrative pairs (piece – pie). However, the priming for the weakly associated integrative pairs (peach – pie) may have been due to list effects (i.e. inclusion of strongly associated pairs). Thus, for Experiment 2, we have developed a stimulus set that consists of pure (only weakly associated) integrative pairs in order to determine whether prospective integrative priming will occur in the absence of the more robust strongly associated pairs.

19. MET expression in Glioblastoma brain tumors

Tamia Waller[1], Margaret Martinez[2], and Ana deCarvalho[3]

1. ReBUILDetroit, University of Detroit Mercy
2. President M. Roy Wilson BUILD Scholars Program, Wayne State University
3. Henry Ford Hospital System Hermelin Brain Tumor center

Glioblastoma (GBM) is the most prevalent and aggressive primary central nervous system tumor, which is highly resistant to the current therapies. Most somatic genomic changes driving these tumors are infrequent. MET oncogene is amplified in 4% of GBM cases. MET gene codes for a receptor tyrosine kinase involved in embryogenesis and wound repair in healthy cells. Activation of MET in GBMs contributes to proliferation, survival and invasion of cancer cells. Increased rate of mutations and occurrence of fusion genes commonly observed in association with oncogene amplification. Patient-derived tumor models have been shown to capture the genomic make up and represent the molecular diversity of the patient population.

Our study focuses on verifying the expression of MET and of MET fusion with the adjacent gene CAPZA2 gene in glioblastoma samples from 3 patients presenting MET gene amplification. For each patient, we analyzed the original tumor biopsy tissue, matched cultured cancer stem cells (CSC), and tumor xenografted into mouse brains. Through RT-PCR and Gel-electrophoresis, we demonstrated that wild-type MET was present in the biopsy and xenograft samples from all three GBM cases. The fusion transcript was present in two of the three biopsy and xenograft samples. We then tested the sensitivity of the MET-expressing CSCs to the multi-kinase inhibitor cabozantinib (Exelixis). The MET tyrosine kinase protein is known for promoting the survival, proliferation, and invasion of not only GBM, but many tumorigenic cancers, making this research applicable to a wide variety of cancer fields.

20. Non-shine-Dalgarno Translation Initiation and Regulation Mechanisms.

Nathaniel Nunez[1], Nadra Alhusini[2] and Jared Schrader[2]

1. ReBUILDetroit, University of Detroit Mercy,
2. Department of Biological Science, Wayne State University

It is generally accepted that prokaryotic translation is governed and initiated through base paring of the Shine-Dalgarno sequence on mRNA with the anti-Shine-Dalgarno sequence on the 16s ribosomal subunit. Despite this foundational translation model proposed through work in E. coli, recent studies have shown that a myriad of bacterial species, including many clinically important species such as Mycoplasma genitalium utilize Shine Dalgarno mediated translation in as little as 8 percent of their genome but these organisms have slow doubling times and lack genetic tools. Caulobacter crescentus is a fast growing, genetically tractable, non-pathogenic organism with Shine-Dalgarno sites in <24% of its genes making it an ideal model organism to study non-Shine-Dalgarno translation. This research aims to quantify the role of initiation factors and ribosomal proteins on non-Shine-Dalgarno translation in C. crescentus. These initiation factors and ribosomal proteins will be purified for an in vitro and in vivo analysis of translational efficiency on non-Shine-Dalgarno mRNAs.

21. Perceptions of Nursing Discipline among Different Culture Groups

Vanessa Lee[1] and Molly McClelland[2]

1. ReBUILDetroit, University of Detroit Mercy
2. McAuley School of Nursing, University of Detroit Mercy

Purpose: The purpose of this study was to determine the perception of nursing discipline, which disciplines are considered a STEM (science, technology, engineering and math) profession and if those perceptions vary by age, culture, gender or previous experience with a STEM professional.

Background: Nursing has been included as part of the NIH BUILD grant, yet discrepancies exist about nurses being perceived as research scientists. Currently, fewer than 1% of nurses have a doctoral degree (Feeg et. al., 2011). The nursing profession is said to have long suffered from public stereotyping and from being closely associated with femininity and powerlessness (Takase et al.,2002).

Methods: A mixed method approach was implemented. Adult participants (age 18 and over) who self-identifed as American, Canadian, Kenyan or from Hong Kong were asked to complete a questionnaire designed to determine perception of nurses as scientists. Survey results were collected and analyzed quantitatively using SurveyMonkey, an online survey questionnaire. Interviews were conducted and interpreted using qualitative methods.

Results: A Chi-Square statistical analysis revealed no significant difference between how various cultures view health professions as STEM disciplines. Nurses were predominately perceived as being part of the STEM disciplines but not scientific. Nurses were viewed as “less scientific” than perceived chemists, physicians or other people in safety googles, labs coats and beakers filled with colorful fluids. Nurses were viewed as less scientific than other health-related professions. Registered nurses were perceived as more scientific than nursing professors.

Conclusion: The discipline of nursing suffers from negative public perception and media coverage suggesting nurses are not intelligent, hand-maid to doctors or sexual playthings. More work is needed worldwide to educate the public on the scientific education and practice of the discipline of nursing.

22. Regulation of Toxin Gene Expression by TcdC from Clostridium difficile

Anthony Croft[1], Adam Boyden[2], and Andrew Feig[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Chemistry, Wayne State University

The human body is crawling with tons of microorganisms; throughout the digestive tract there are 1000s of different species of bacteria. Although most are benign, some pathogenic organisms can attack the body and result in serious or even fatal infections. Clostridium difficile (C. diff.) is a spore-forming anaerobic bacterium that causes colon inflammation and severe diarrhea in humans. People are generally exposed to C. diff. during hospital visits. Virulent strains of C. diff. carry Toxin A and Toxin B that cause damage to the gastrointestinal tract. Regulatory genes (tcdR, tcdC, and tcdE) located within the pathogenicity locus control TcdA/B expression and export. TcdR acts as a positive regulator for toxin release while tcdC acts as an anti-repressor and thus positively regulates expression. tcdE works as a hollin to release tcdA and TcdB allowing toxin to find and kill host cells. Although C. diff. can be killed by some antibiotics, hypervirulent strains which cause the most serious illness are often antibiotic resistant. My research focuses on the tcdC protein and how they bind to Guanine-quadruplexes. G-quadruplexes are tertiary structures that form between Guanine bases in DNA and RNA. Prior research has shown that truncated versions of tcdC bind DNA-quadruplexes. In my research I am using naturally occurring full-length versions of tcdC and DNA oligonucleotides, which are short nucleic acid chains commonly used in research, so that my results can be directly relatable to regulation of toxin release in vivo. So far I have expressed and purified recombinant TcdC from E. coli. I then tested the ability of TcdC to bind specific G-quadruplexes from C. diff. Unfortunately in the trial binding assays, there was no evidence that binding occurred, so I also tested G-quadruplex folding in the presence of Triton X-100 to make sure G-quadruplexes are not denatured by the detergent. Ongoing work will continue to determine how the hydrophobic extension inhibits DNA/RNA binding and affects TcdC function. Understanding how TcdC regulates toxin expression in hypervirulent strains will ultimately help us inhibit toxin release in Clostridium difficile to alleviate the cellular damage caused by these serious infections.

23. Rule Abstraction in a Honeybee T-maze: A Pilot Study

Desiree Austin[1], Arthur McCray[2], Victoria Torres[2], and Karen Doyle[3]

1. ReBUILDetroit, Marygrove College
2. ReBUILDetroit, University of Detroit Mercy
3. Department of Biology, Marygrove College

Can foraging honeybees learn and use an abstract rule in a T-maze? Bees have previously demonstrated a flexible and proficient navigational system along with the creation and adaption of abstract rules. A colony of bees was maintained indoors with access to the outside to allow for foraging. To exit, foraging bees were presented with a PVC T-maze equipped with both a correct and incorrect pathway arm. Both pathways included an LED emitter-detector pairing to track movement. The correct location led to the exit and the incorrect location did not allow bees access to the outside. To test for alternating rule abstraction, experimenters changed maze components so that the correct pathway alternated daily (e.g Day 1 – Left, Day 2 – Right, Day 3 - Left). Maze components were also placed in a planned randomized fashion to control for navigational pheromones. Disruptions in emitter-detector pairings were recorded and counted as behavioral choices. The amount of correct and incorrect choices were compiled each day and compared across the experiment. From early data, bees chose the left arm of the T-maze proportionately more often than the right regardless of correct arm, but most recent data suggests this may be a transitive effect. As previous literature demonstrates that bees can navigate a Y-maze using a rule, the absence of rule abstraction in this current study may be due to associative cuing. Future manipulations include changing spatial location of the T-maze so arms are equidistant to the exit and examination of bees' natural instinct towards win-stay strategies.

24. Socioeconomic status as a potential moderator for the relationship between coping and social support

Jace Paupert[1], Kristen Abraham[2], and Monika Sata[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Psychology, University of Detroit Mercy

These analyses were designed to assess whether or not socioeconomic status (SES) acts as a moderator between coping and social support. This data was previously collected as part of a class project for the winter 2016 ReBUILD Detroit health disparities research coordination network course at the University of Detroit Mercy. The sample consisted of 88 participants, all undergraduate students at the University of Detroit Mercy (31.8% male and 68.2% female). Previous studies have indicated that there is a positive correlation between social support and coping (Valentiner, Holahan & Moos, 1994). Studies have also shown that low childhood socioeconomic status may be rassociated with lower coping skills whereas high childhood socioeconomic status is associated with higher social support (Beatty, Kamarck, Matthews & Shiffman, 2011). Based on these findings it was hypothesized that socioeconomic status (SES) moderates the relationship between social support and active coping such that among individuals with lower socioeconomic status there would be a stronger correlation between social support and active coping as compared to among individuals with a higher socioeconomic status. It was also expected that socioeconomic status would moderate the relationship between social support and avoidant coping such that among individuals with lower SES there would be a stronger negative correlation between social support and avoidant coping as compared to among those of higher SES. In general, the hypotheses were not supported by the results. Regardless of level of socioeconomic status, there were no statistically significant correlations between social support and coping styles. Limitations and implications are discussed.

25. The Addition of Michael Acceptors to Pyridine Salts

Tierra Modock[1] and Klaus J. Friedrich[2]

1. ReBUILDetroit, Marygrove College
2. Department of Chemistry and Biochemistry, University of Detroit Mercy

Michael additions were added to pyridine salts to see how they would react together. Pyridine salts are precursors to pharmaceuticals and are important solvents and reagents . Also, they are used in development of ammonia. Michael addition is addition of new nucleophiles to a carbonyl compound. By adding Michael acceptors to pyridine salts a bicycle product should form meaning it has two rings. The reactions made can be useful in medicine to treat Parkinson's Disease. The project is inconclusive.

26. The Characterization of Multiple Electrodes for Biomedical Applications

Christopher Harness[1], Zhiguo Zhao[2], Eric Kim[2] and Yong Xu[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Electrical and Computer Engineering, Wayne State University

When developing a new biomedical device, the purpose of the electrode is to serve as a sensor in means of recording data (such as voltage and current levels) when gathering signals from that of an organism, a substance's pH level, or otherwise. Due to materials having different characteristics, they need to be selectively chosen for specific applications in various fields. The following research focuses on characterizing the properties of various electrodes [Gold (Au), Iridium Oxide (IrOx), Platinum Iridium (PtIr), and Silver/AgCl] that can be used in biomedical applications such as a customized neural probe, cochlear implant, or micro pH sensor. Several tests were performed to characterize the four different types of electrodes including: measuring impedance, cyclic voltammetry, and measuring potential levels signifying different pH levels for this micro-device. The impedance measurement was performed by applying an AC signal between the electrode of interest and a piece of platinum counter electrode, through a 1X Phosphate Buffer Saline (PBS) solution via LCR meter; as a result, the Au electrode contained an average impedance of 5.79×〖10〗^3 Ω while the electroplated IrOx electrode had 8.71×〖10〗^2 Ω when obtained around the frequency of .2 – 20 kHz. The Cyclic Voltammetry test (used for electroplating various solutions) resulted in the tested devices falling in between the charge capacity range of -1.02×〖10〗^(-7) and -7×〖10〗^(-9) Coulomb/〖cm〗^2. Lastly, a test to evaluate the performance of the electrodes' stability and durability in different pH buffer solutions was given to show the potential difference between the IrOx electrode and a commercial reference electrode. There were different differences in potential between each electrode within the different pH solutions; however, all managed to keep stable throughout the duration of these tests. With the classification of these various electrodes, devices can be properly suited for biomedical purposes and are able to receive sufficient data without causing any harm or other technical faults.

27. The Effect of Emotional Facial Expression on Electrocortical Processing and Perceived Trustworthiness

Limi Sharif[1], Craig Peters[2], Farrah Elrahal[2], and Christine A. Rabinak[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University
2. Eugene Applebaum College of Pharmacy and Health Sciences, Wayne State University

The late positive potential (LPP) is an event-related potential (ERP) component that is larger for emotional compared to neutral stimuli. However, previous studies suggest that neutral facial expressions may not actual be perceived as neutral and often are rated as negative. We compared the LPP amplitude during the presentation of different emotional facial expressions (fear, happy, neutral) to investigate whether neutral faces evoke a different LPP response than fear/happy faces. ERP and behavioral responses were collected in 23 Michigan student police officers during a validated emotional faces appraisal task. LPP amplitudes were significantly larger for fear (3.16μV ± 3.12), happy (2.12μV ± 3.65), and neutral (3.03μV ± 3.60) faces when compared to a non-face control (shapes; -1.28μV ± 2.17; ps<0.001). Interestingly, the LPP amplitude to neutral faces was not significantly different from fear or happy faces (p>0.05). Moreover, trustworthiness ratings for fear (47.75 ± 14.99) and neutral faces (43.81 ± 15.12) were similar and not significantly different (p=0.08), and were rated as significantly less trustworthy than happy faces (61.31 ± 13.97; ps<0.001). Together, these results suggest that neutral faces may not actual be perceived as "neutral" and may actually convey negative connotations.

28. The Effects of Sustaining a Sports Related Concussion on Perception of Risk to Participate in the Sport

Jasmina Cunmulaj[1] and Molly McClelland[2]

1. ReBUILDetroit, University of Detroit Mercy,
2. McAuley School of Nursing, University of Detroit Mercy

The Effects of Sustaining a Sports Related Concussion on Perception of Risk to Participate in the Sport.

Introduction: Contact sports have been prevalent in society for years. However, not until recently have researchers and doctors found that sustained concussions can have harmful, life-altering post-concussion effects, often permanent. There is limited research done comparing the effects that sustaining a concussion has on athletes' decision to remain in the sport. Additionally, more research needs to be done in order for contact sport athletes to continue to be able to participate in the sport they are so passionate about while preventing concussions.

Background: The effects of participating in a contact sport (ie…football, hockey, rugby, boxing, etc…) as well as sustaining a concussion as an outcome is an influential factor in deciding whether to continue participating further in the sport. A vast majority of contact sport athletes are aware of the hazards of concussions and the potentially negative health outcomes. New rules and regulations have been implemented to prevent concussions but many athletes are still experiencing traumatic brain injuries.

Objective: The purpose of this concussion study was to understand contact sport athlete decision to remain playing despite the risk for sustaining a concussion. Additionally, a second objective was to determine if sustained permanent negative health outcomes would alter the decision to remain playing the sport.

Method: Approval was obtained from UDM's institutional review board (IRB) prior to beginning the study. Purposive sampling was implemented. Contact sport athlete volunteers included athletes over the age of 18 who had:
1.) Sustained concussions and were retired, or
2.) Were currently playing and had sustained one or more concussions, or
3.) Current contact sport athletes who had not sustained a concussion.
Each volunteer was issued a survey of questions regarding their past history and knowledge of concussions. Follow-up discussion-type interviews were also implemented which allowed for more in depth conversation of participants feelings and past experiences with concussions.
All volunteers were given a flow-chart questionnaire to determine if the volunteer had sustained a concussion(s), the severity of the concussion(s), number of concussions sustained, and any follow-up treatment done post-concussion.

Additional qualitative information regarding concussions was also received from NHL professional athletic team trainer

Results: A total of 12 volunteers participated in the study from a variety of contact sports. 6 out of 7 hockey players interviewed had sustained one or more concussions. All participating contact sport athletes who sustained concussions admitted noticeable health-related changes afterwards. These changes included, but were not limited to; changes in memory (most commonly reported symptom), slowing of cognitive, irritability, and depression. All athletes stated that they would continue to participate in the sport regardless of the known risks for concussion. Athletes were also aware of the association between number of concussions and length of time playing although this knowledge did not deter the athlete from leaving the sport. One volunteer who had experienced an excessive amount of concussions, reported suffering from multiple post-traumatic disorders including; memory loss, irritability, depression, and epilepsy. The volunteer stated "It is sad because I don't remember half of my life that happened to me at a younger age".

Conclusion: Knowledge of risk for sustaining concussion and potential significant health-related negative outcomes do not deter contact sport athletes from participating in high-contact sports. Therefore, scientists, researchers and sports administrators need to determine improved ways to prevent athletes from sustaining concussions while still being able to participate in the sport.

29. The Effects of Texting and Driving: Influence of Driving Speed

Ki-Jana Malone[1], Mohammed Mohammed[1], Amina Ammar[2], Ashley Blanchette[2], Bradley Berak[2], Brian Bint[2], Dung Ho[2], Helana Makki[2], Mariam Salameh[2], Doreen Head[2], and Randall Commissaris[2]

1. President M. Roy Wilsion BUILD Scholars Program, Wayne State University
2. Eugene College of Pharmacy and Health Sciences, Wayne State University

Texting and driving has proven to be a dangerous combination, as prior research has shown and as more fatal accidents have been caused due to texting. With texting becoming such a dangerous element to distracted driving, it could be conclusive to discover if other distracting elements could be combined to see how impaired driving can really be. One longer-term goal or our research group is to test medical marijuana patients and characterize their ability to drive and text while 'under the influence'. We conducted this pilot study on the effects of driving speed on texting while driving to discover how/whether we might want to adjust the testing conditions for the medical marijuana study. We gathered 9 adult drivers and had them drive on a simplistic road in a fixed-base driving simulator while driving at around 60 mph, a relatively normal speed, versus driving at 80, a high, freeway-like speed. We had drivers maintain their speed during a straightaway and retype a simplistic, everyday text, and judged videotapes of their 'drives' on a 1-4 scale, with a score of 1 being perfect, and 4 being a catastrophe. Our data demonstrated (1) texting while driving impaired driving at both speeds and (2) there was a trend for driving to be worse at higher speeds.

30. The Function of Plasminogen Activator in Yersinia pestis

Christina Jones[1], Suleyman Felek[2], Joshua J. Thomson[2] , and Eric. S. Krukonis[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Biomedical and Diagnostic Sciences, University of Detroit Mercy School of Dentistry

Yersinia pestis, the causative agent of the plague, utilizes Plasminogen Activator (Pla) to adhere to host cells and activate the host's circulating plasminogen into plasmin via proteolysis. Plasmin then degrades fibrin clots at the point of infection and allows the bacteria to disseminate into the bloodstream. Pla has a β-barrel structure containing five short extracellular loops. We altered various amino acid residues of the loops to determine their roles in proteolysis and ligand binding. While some Pla residues previously defined as critical for cleavage of plasminogen were also important for plasminogen binding (D86, S99, H101, D206), other residues maintained relatively strong plasminogen binding despite being unable to cleave the substrate (W87, T96, D97, H208, R211), suggesting the residue is only critical for proteolysis. Binding of Pla mutants to a ligand found in extracellular matrices, laminin, indicated some distinct residues important for binding (D86, W87, N91, D97, S99, S100, H101, D206, R211). Finally, Pla is known to facilitate delivery of cytotoxic Yop proteins from Y. pestis into host cells using a type 3 secretion system (T3SS). We found some residues required for proteolytic activity hinder Yop delivery (D86, R211) suggesting these residues, while locking proteolytic substrates in place for cleavage, may impede binding to other substrates.

31. The Relationship between Social Factors, Behavior, and Neighborhood Level Indicators among Teens with Asthma

Carmella Goree[1], Cheryl Miree[2] and Christine LM Joseph[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Department of Public Health Sciences, Henry Ford Health Systems

Introduction

Asthma is a chronic lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing, chest tightness, shortness of breath, and coughing.

Asthma has no cure. However, with today's knowledge and treatments, most people who have asthma are able to manage the disease. As in other urban areas, the prevalence of asthma in Detroit public schools is higher than that of US children, (almost 20% versus 10% respectively). Asthma can affect the overall quality of life (QoL) of a young person, which is defined as the standard of health, comfort, and happiness experienced by an individual. African American teenagers ages 15 to 19 also have higher asthma-related death rates than white teens and children younger than 14. Despite asthma being a burden on so many youth there are few programs to help young people better manage their asthma. This is why the Puff City program was created. Puff City is a mobile asthma program developed by Henry Ford Hospital and University of Michigan. This program is for teens ages 13-19 who have the opportunity to learn ways to better manage their asthma and live healthier lifestyles. Through the surveys given in this project we find out about social support and smoking habits of teens, and their caregivers.

Research Questions

1. What is the QoL in teens with asthma?
2. How does neighborhood level indicators relate to QoL scores, smoking status and social support?

Methods

First, to identify the students with asthma, questionnaires on asthma symptoms were administered to 9th-12th graders during English class. The eligible students were then signed up, and filled out the online surveys about asthma management. This project uses the baseline survey completed by the student and the student's caregiver. QoL was measured by the Juniper Paediatric Asthma Quality of Life Questionnaire. Social support was measured using the Medical Outcomes Study Social Support Survey. Smoking questions are from the Youth Risk Behavior Survey. We collected information on neighborhood factors (% poverty, median household income and unemployment) from the 2010 census. We calculated means (standard deviations) and conducted a t-test to describe our results.

Results

There were six schools that participated in Puff City. From the six schools, we had 422 students who completed the survey. Of the 422 students, 98% of them were African-American, 60% were female and the mean age was 15.6 years. Across the schools, the QoL for the teens was about the same with a mean of 4.6 on a Likert scale (1-7). On the other hand, the caregiver's QoL was very low on a Likert scale (1-7) with the average being 1.9 over all six schools. The result of the paired t-test indicated a significant difference in the mean score of QoL between caregivers and the teens ($p < .0001$). It is important to note that teens at School C reported the lowest QoL (4.25) among all of the schools. The caregivers at School A reported the lowest QoL among all schools at mean rate of 1.74. Amongst teens, School F had the highest percentage of teens who smoked in the past 30 days (11.7%) and the School C caregivers had the highest percentage of smokers (38.6 %). Situations in which teens reported it was tough not to smoke were, "feeling stressed" (17%) and "feeling anxious" (17%). School D had the highest average of caregiver social support (4.19) on a Likert Scale (1-5) and School B and School C had the lowest mean score at ~ (4.0).

Discussion

We observed that School D's zip code, which has about an average median household income amongst the six schools, had the highest QoL for the caregivers and highest social support. They also had the lowest caregiver and teen smoking rates. School D may show that with an average income and the parents having social support not only will the parents feel better about their QoL but the teens will practice fewer bad habits. Teens who attend School F which has the lowest median household income at ~ $18,660 and 50% living below the property rate had the highest smoking rate possibly because there are stressors in their environment that cause them to practice smoking as a coping mechanism. School C's teens had the lowest mean score for QoL which could be one of the reasons their caregivers had the highest smoking rates. A reason that the caregivers QoL is so low compared to the teens could possibly be because in many cases parents want what's best for their children even if they have to sacrifice from themselves. From this research project we can see that neighborhood factors could have a possible effect on teens and their caregivers QoL, and habits.

Acknowledgement

This project was funded by a grant from the Institute of Health, National Heart, Lung and Blood Institute Grant R02 HL67462-01.

32. The role of pericytes in neurodegenerative diseases of the brain

Arnulfo M. Cazares[1], Annelise Crabtree[1] and Paula Dore-Duffy[2]

1. President M. Roy Wilson BUILD Scholars Program, Wayne State University,
2. Department of Neurology, Wayne State University School of Medicine

Pericytes are unique, contractile and motile cells of the microvasculature. They are located in pre-capillary arterioles, capillaries and post-capillary venules of all tissues. Pericytes are regulatory cells that exhibit extraordinary characteristics such as being able to formulate an immune response, start/inhibit angiogenesis, and demonstrate pluripotency. In the brain they are integral members of the "neurovascular unit" (endothelial cells, pericytes, astrocytes and neurons). However, very little is known about the complex cell to cell communication and interaction of pericytes with other cells of the nervous system. In our project we are questioning how pericytes communicate with neurons. To study the interaction of pericytes with neurons we developed a co-culture system using Cath. a-differentiated (CAD) cells which are neuronal cells that secrete acetylcholine and primary pericytes. Previous studies have shown that pericytes induce the differentiation of CAD cells in vitro in the absence of classic differentiation medium. In our experiments we are questioning whether pericyte-induced neuronal differentiation involves cell to cell interactions and/or release of a signaling molecule. In the first experiment we are comparing pericytes to conditioned medium. Using a 24-well plate, we cultured CAD cells at low density. Pericytes, pericyte conditioned medium, or CAD cell conditioned medium was added to plates. Evidence of neuronal differentiation will be quantified by counting neuronal projections and morphological evidence of differentiation. In the second experiment we will question whether cell to cell contact is needed. We expect to see the pericytes will induce neurons to differentiate but it is unclear whether this requires direct pericyte contact.
Other projects and experience:
Experimental autoimmune encephalomyelitis (EAE): EAE is an animal model of multiple sclerosis. In previous work Dr. Dore-Duffy has shown that pericytes as stem cells can reduce the signs and symptoms of disease in mice. The purpose of the experiment we have participated in is to evaluate the role of fat pericytes as potential therapeutic intervention. The mice are immunized with MOG peptide to induce autoimmune demyelinating disease. They mice are then injected with fluorescently dyed fat pericytes after they develop symptoms (12-18 days) after immunization. Mice will be scored for daily for clinical activity daily using a 5 point scoring system. After 10 days they will be sacrificed and the spinal cord examined for autoimmune histology and whether pericytes are present.

33. Visual Search in Red Light: A Test of Magnocellular Suppression

Aleksandar M. Tasich[1], Yunus O Ayodeji[2] and Harold Green[3]

1. ReBUILDetroit, University of Detroit Mercy
2. ReBUILDetoir, Marygrove College
3. Department of Psychology, University of Detroit Mercy

Suppression of the magnocellular system hinders spatial attention, which is linked to the eye movement/saccadic pathway. It is not known whether or not aforementioned magnocellular suppression also affects the saccadic pathway. Prior research has shown that diffuse red light suppresses the magnocellular system, especially in the lower visual field (LoVF). Assuming that suppression of the magnocellular system affects the saccadic pathway, we hypothesized that fixation durations would be longer in red as compared to grey light, and that these durations would be even longer for saccades directed towards the LoVF. Eighteen participants were utilized to test this hypothesis by using an EyeLink II eye-tracker, programmed to compare eye movements when searching for a target that was hidden in red and grey noise. It was revealed that fixation durations were indeed longer in the red light trials as opposed to the grey ones, but the effect was not significantly bigger in the LoVF. Emotional and cognitive responses are influenced by the visual system. Therefore, this research not only contributes to our ability to predict performance in spatial-attention guided tasks (e.g., visual search, reading, scene viewing), but also our ability to better treat neurodevelopmental and psychiatric disorders.

34. Vitamin D and Vitamin K Effects on Gene Expression in HUVEC

Royce Swasey[1], Allison Richards[2], Francesca Luca[2]

1. ReBUILDetroit, University of Detroit Mercy
2. Center for Molecular Medicine and Genetics, Wayne State University School of Medicine

Many studies indicate hypovitaminosis D (Artaza, Mehrotra, Norris 2009) and hypovitaminosis K (Heuvel et al. 2014) as risk factors for cardiovascular diseases and complications. Here we studied the effects of vitamin D and vitamin K on gene expression in human umbilical vein endothelial cells (HUVEC). Prior to this investigation, gene expression changes had been studied in the Luca lab in HUVECs treated with vitamin D and LCLs treated with vitamin K. From these previous results, we selected genes that were either up- or down-regulated following vitamin D or K treatment as compared to control samples. We then treated HUVECs with a high dose of vitamin D (1mM), low dose of vitamin D (0.1uM), low dose of vitamin K (1uM), and ethanol, as a vehicle control. Cell lysis and RNA extraction was performed with Qiagen's RNeasy Plus Mini Kit on the QIAcube instrument (Qiagen). We determined RNA concentration after isolation by spectrophotometry using a NanoDrop 1000 and synthesized cDNA through reverse transcription with the SuperScript® III First-Strand Synthesis System. Primers were then designed using UCSC Genome Browser (for gene sequences and primer sequence database) and NCBI's Primer-BLAST (to find primers specific to our PCR template) which uses Primer3 and BLAST. Primers must sufficiently cross an exon-exon junction and contain a melting temperature (Tm) minimum of 59°C, optimum of 60°C, and maximum of 61°C. cDNA samples and primer designs are now prepared to be used for polymerase chain reaction (PCR) to quantify gene expression. By studying these compound's effects on gene expression in HUVECs, we can further understand their effects on the cardiovascular system and the organism as a whole.

References

Artaza, J. N., Mehrotra, R., & Norris, K. C. (2009). Vitamin D and the Cardiovascular System. Clinical Journal of the American Society of Nephrology, 4(9), 1515-1522. doi:10.2215/cjn.02260409

Heuvel, E. G., Schoor, N. M., Lips, P., Magdeleyns, E. J., Deeg, D. J., Vermeer, C., & Heijer, M. D. (2014). Circulating uncarboxylated matrix Gla protein, a marker of vitamin K status, as a risk factor of cardiovascular disease. Maturitas, 77(2), 137-141. doi:10.1016/j.maturitas.2013.10.008

35. Women's Reproductive Trajectories after Spinal Cord Injury

Leigha Thomas[1] and Heather Dillaway[2]

1. President M. Roy Wilson BUILD Scholars Prgoram, Wayne State University
2. Department of Sociology, Wayne State University

The aims of this study are to explore how the timing of a spinal cord injury may affect (1) women's reproductive options and experiences, and (2) how they think about reproduction after spinal cord injury. This is important because women with disabilities require special medical attention, education and support during reproductive experiences. In our research, a qualitative study was conducted with 20 women with spinal cord injury in the Detroit area. Data were collected via in-depth interviews, followed by comparative analysis of interview transcripts. Our data show that timing of injury, pre-injury experiences, and expectations of both the women and outsiders post-injury all shape women's reproductive trajectories. In addition, the interplay of the timing of injury and pre-injury experiences shape expectations for reproduction. A life course perspective provides a lens for exploring not only how reproductive expectations and trajectories are shaped by injury, but also how spinal cord injury is experienced differently depending on the timing of injury, pre-injury experiences, and post-injury expectations. Women injured at different life stages may have varied healthcare and support needs as they seek reproductive lives post-injury.

36. Translation regulation of the asymmetric cell division genes *spmX* and *fliQ*

Jessica Aroh[1] and Jared Schrader[2]
1. Wayne County Community College District
2. Department of Biological Science, Wayne State University

Asymmetric cell division is an essential process in the development of multicellular organisms whereby cells of different fates are generated despite being genetically identical. The simplest organism to undergo asymmetric cell division is *Caulobacter crescentus*, which divides asymmetrically at each division to generate two distinct cell types, a motile swarmer cell and a sessile stalked cell. Central to this process in *Caulobacter*, are two polar protein regulatory genes, *spmX* which makes the stalk in the stalked cell, and *fliQ,* which makes the flagella in the flagellated cell. Both of these two genes were recently found to be controlled to a certain phase of the cell division cycle by regulated mRNA translation level. Therefore, the aim of this project is to identify what controls the cell cycle-regulated translation timing of these two genes. This will be achieved by generating YFP translational reporter variants and assessing their cell cycle activities. To determine the mRNA sequence elements required for cell cycle-regulated translation, we will then mutate these promoters and screen for mutants that are constitutively translated.

37. The Effects of Texting and Driving: Influence of Text Length

Mohammed Mohammed[1], Ki-Jana Malone[1], Amina Ammar[2], Ashley Blanchette[2], Bradley Berak[2], Brian Bint[2], Dung Ho[2], Helana Makki[2], Mariam Salameh[2], Doreen Head[2], and Randall Commissaris[2]

1. President M. Roy Wilsion BUILD Scholars Program, Wayne State University
2. Eugene College of Pharmacy and Health Sciences, Wayne State University

Texting and driving has shown itself to be dangerous time and time again. Another dangerous impediment to driving is drugs; with the rapid rise of medical marijuana use and the overuse of opioid prescriptions, driving under the influence, and also texting while driving under the influence, is becoming more and more likely. While planning to research the effects of medical marijuana on texting while driving, pilot studies were conducted to determine the effects of the length of the text message on driving performance. Participants drove in a fixed-base driving simulator (2001 Chevy Impala) and were we sent four text messages, two being short (i.e., one-word) messages and two being longer messages. Participants were asked to read, re- type and re-send the messages while continuing to drive normally. Drives were videotaped, and the videos were rated 1-4, 1 being perfect and 4 a catastrophe. As predicted, the longer the text was, the worse the drive was. It is important to note, however, that even short one-word text responses were associated with driving impairment. This research will serve as a precedent for our upcoming experiments with medical marijuana patients and also goes to show that no matter the length of a text, texting and driving has a negative effect on how you drive.