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Poster Title: The Orphan Nuclear Receptor Estrogen-Related Receptor, ERR, is an Essential Regulator of Carbohydrate Metabolism

Objective: To delineate the physiological role that the ERR nuclear receptor has in the fruit fly, Drosophila melanogaster, a simple model organism.

Background: Recent evidence in mammalian systems suggests that a primary function of ERRs is to transcriptionally regulate energy expenditure; however, the absence of a known endogenous ligand and the existence of three separate paralogous ERR genes in mammals, all with overlapping expression patterns and near identical DNA-binding specificities, has made it difficult to discern the functions of any single ERR gene. We have thus turned toward the fly, an organism that maintains high conservation with respect to nuclear receptor function and which has a single err gene, to gain insight into evolutionarily conserved functions of ERRs.

Method: We have used a combination of targeted genetic manipulation, biochemical analysis, a variety of molecular approaches, and bioinformatics to determine ERR function in the fly.

Result: We have determined that ERR has a profound impact on the transcriptional regulation of all aspects of carbohydrate catabolism. ERR mutant animals display remarkably elevated levels of circulating sugars and glycolytic precursors. Moreover, although much of the transcriptional deficits we have seen in the fly are limited to carbohydrate breakdown (i.e., glycolysis, the pentose phosphate shunt pathway), err mutants are characterized by widespread metabolic derangement, with levels of stored fat, intermediary metabolites, and select amino acids displaying severe depletions. Furthermore, we have been able to establish that ERR is integral to metabolic adaptation in hypoxic conditions.

Conclusion: Our findings indicate that Drosophila ERR, similar to its proposed mammalian function, maintains a striking impact in the regulation of energy expenditure. We have unexpectedly uncovered a carbohydrate-centric role for ERR and have demonstrated that it participates in the metabolic adaptation to low oxygen levels.
Poster Title: Trans-Axillary Robotic-Assisted Thyroid Lobectomy: A Novel Approach to Thyroid Surgery

Objective: Thyroid lobectomy through a trans-axillary approach using a robotic surgical system is a novel surgical approach. Assessment of the feasibility of this approach was evaluated. In addition, operative times and postoperative length of stay and pain was recorded.

Background: Thyroid nodules are very common, with an estimated prevalence of palpable nodules ranging from 3 to 7%. They have been shown to be four to six times more prevalent in women than men. FNA will diagnose approximately 5% of these as malignant, requiring operative intervention. Thyroid cancer has been estimated to affect almost three times as many women as men. Approximately 10-20% of FNA specimens will be indeterminate and require surgery for diagnosis. As a result, operative intervention for thyroid nodules is a significant issue for women. We present an alternative method for this intervention which provides improved visualization and cosmesis.

Method: Eight thyroid lobectomies were performed via a trans-axillary robotic approach. Operative times were recorded including for: the trans-axillary dissection, docking the robot, and operative time to complete the dissection. Patients were monitored postoperatively for level of pain and postoperative complications. Statistical analysis was not performed due to the limited data set.

Result: Eight thyroid lobectomies for benign disease were performed utilizing a robotic surgical system. Neither surgery required conversion to a cervical approach. Total operative time was 183 to 256 minutes (mean 218 minutes). Time required for dissection was 28 to 76 minutes (mean 52 minutes) and time for docking was 5 to 17 minutes (mean 10.5 minutes). Operative console time was 98 to 192 minutes (mean 131 minutes). Postoperatively, patients reported pain scores of 9 or less on a scale of 0-10 which was controlled with oral medication at the time of discharge. All patients required only a standard overnight hospital stay. Two patients developed a seroma at the surgical site which was aspirated at their postoperative visit.

Conclusion: Trans-axillary robotic-assisted thyroid surgery is a feasible method for thyroidectomy. Postoperative length of stay is no longer than that of traditional thyroid lobectomy. This approach provides a more cosmetic alternative for those patients who do not want a scar on their neck. Further evaluation of this procedure compared to the traditional cervical approach is reasonable and safe.
Objective: The objectives of this study were to examine the association between depressive symptomatology and indicators of bone turnover among older adults, and to evaluate whether bone metabolism mediates the association between lifetime number of depressive episodes and bone mineral density (BMD).

Background: Depression is a common mental health condition in later life, and use of medications to treat depressive symptoms has increased in recent decades. The prevalence of osteoporosis, indicated by low BMD, and associated fracture risk increases substantially in later life, particularly among older women. Depression and antidepressant use have been associated with reduced lower spine BMD in older adults. However, it is unknown whether physiologic dysregulation, specifically alternations in bone metabolism, mediates this association.

Method: Analysis utilized a case-cohort study nested within the Baltimore Epidemiologic Catchment Area Study, a population-based sample of adults that recently completed its 23-year followup. Depression was measured using the Diagnostic Interview Schedule at four time points over the followup period. Lower spine BMD was measured in 2005/6 by dual-energy x-ray absorptiometry (DEXA). Markers of bone turnover were analyzed from serum blood samples collected during the 2004/5 wave of fieldwork. Exploratory factor analysis was used to develop a latent variable of bone metabolism and the role of this construct as a mediator in the relationship between depression and BMD was assessed using structural equation modeling (SEM).

Result: The markers of bone metabolism were described by a common factor. Number of depressive episodes reported over the lifetime was associated with reduced lower spine BMD (beta = -0.17 p<0.058) and elevated bone metabolism (beta = 0.18 p<0.006). Lifetime antidepressant use was associated with reduced BMD in women (beta = -0.27 p<0.01) but not in men, and antidepressant use was unrelated to bone metabolism in either sex.

Conclusion: Increasing number of depressive episodes was associated with elevated bone metabolism and reduced BMD. These results are consistent with the hypothesis that depression is associated with bone metabolism, but bone metabolism was not a mediator of the association between depression and BMD. Prospective analyses are necessary to confirm the temporal relationship between depression, bone metabolism, and BMD.
Poster title: Sphingosine Kinase 1 as a New Target to Treat Breast Cancer

Objective: To identify the best mouse model to mimic human breast cancer progression and explored the therapeutic implications of targeting SphK1 both in vitro and in vivo.

Background: Sphingosine kinase 1 (SphK1) is one of the key enzymes that regulates the potent bioactive sphingolipid mediator, sphingosine-1-phosphate (S1P). S1P promotes cancer cell proliferation, migration and angiogenesis. It has been reported that overexpression of SphK1 significantly enlarged breast cancer in animal model, and that its overexpression correlates with poor outcome in human samples. However, currently there is no consensus in the appropriate mouse model to study breast cancer progression, let alone the effect of inhibition of SphK1.

Method: We developed a novel isozyme-specific pharmacological inhibitor of SphK1, SK1-I. 4T1-luc2, a murine breast cancer cells that overexpress luciferase were used to evaluate between mouse models. Western blotting, qPCR, luciferase and colony formation assays for proliferation, Xenogen's IVIS 200 optical imager and mass spectrometry for in vivo model were used.

Result: 4T1-luc2 cells highly overexpressed SphK1 mRNA both in vitro and in vivo. Inhibition of SphK1 using either SK1-I or gene silencing using siSphK1 suppressed 4T1 cell proliferation, which is confirmed both by luciferase assay and colony formation assay. Importantly, SK1-I inhibited 4T1 cell growth synergistically with the chemotherapeutic drug doxorubicin. Next, we have identified that open mammary implantation method best mimic human breast cancer progression using pathological analysis, lymphazolin and IVIS 200. Using this model, we have found that plasma S1P levels were higher with animals with primary breast cancer, as opposed to metastatic lesions. Moreover, using this model, we have found that continuous infusion of SK1-I decreased tumor burden of orthotopically implanted 4T1-luc2 cells in vivo.

Conclusion: Our results support the notion that SphK1 is an important factor in breast cancer proliferation and suggest that SK1-I could be a candidate for future target therapy.

This work was supported by VCU BIRCWH (NIH-K12HD055881) and Susan G. Komen for the Cure (KG090510) to KT, Sumitomo Life Social Welfare Services Foundation grant to MN, and NCI (R01CA61774) to SS.
Poster Title: Perception of Cervical Cancer Screening and HPV Vaccination-Impact of New Guidelines in the Community

Objective: Recent availability of vaccine against Human Papilloma Virus (HPV), the most commonly acquired sexually transmitted disease (STD) in United States marks a beginning of new era. Perceived cervical cancer risk determines the intention of cervical cancer screening. In this pilot study, we aim to understand the adequate delivery of information on HPV vaccination and post vaccination cervical cancer screening and risk for acquiring STD in women with substance abuse (SA) disorder in the community.

Background: Perceived cervical cancer risk determines the intention of cervical cancer screening. In this pilot study, we aim to understand the adequate delivery of information on HPV vaccination and post vaccination cervical cancer screening and risk for acquiring STD in women with substance abuse (SA) disorder in the community.

Method: We designed a randomized control trial in a women's residential facility at community-based SA treatment center serving racially diverse population. All women age >18 years were eligible (within one week of admission) if they were English-speaking, not pregnant and not prisoners. Intervention designs were carefully planned using input from our community partners at SA treatment center. Consecutive eligible admissions were randomly allocated, first to fill intervention group, then, after 5 week hiatus, control group without overlap. Realm-R questionnaire was used to test health literacy. At baseline, all participants were administered a computer-based survey on cervical cancer screening and HPV vaccination. An education intervention on NCI Understanding Cancer Series: HPV Vaccine PowerPoint was administered to intervention group and The Heart Truth PowerPoint to control group. All educational interventions were immediately followed by re-administration of computer-based cervical cancer screening and HPV vaccination survey. We measured the effect of HPV vaccine education on knowledge of cervical screening and HPV vaccination.

Result: We recruited 18 participants in each intervention and control group. In the intervention group, one eligible client declined to participate, two participants were discharged early from the center and did not complete study protocol. Analysis pending.

Conclusion: We will compare the changes in knowledge of HPV vaccination and perception of cervical cancer screening in the intervention and control group. Based on these results we will design a larger randomized clinical trial on the use of appropriate educational tools to promote HPV vaccination and dissemination of appropriate knowledge of post vaccine cervical cancer screening and risk for other STD among high risk women in the community.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2009-2010
**Poster title**: Methods for DNA Extraction from Saliva and Dental Plaque

**Objective**: The objective of this pilot study was to determine the best method for DNA extraction from saliva and plaque samples of mothers and their infant children.

**Background**: Early Childhood Caries (ECC) is the most common disease of childhood affecting significant numbers of children from minority ethnicities, lower socioeconomic levels, and lower parental educational backgrounds. There are multiple influences on the early growth of the dental biofilm of an infant. HLA-DRB1*04 is a type of human leukocyte antigen associated as one of the predisposing genetic factors affecting the susceptibility for ECC. Extracting DNA from saliva and dental plaque sample has become more important after it was established that some complex microbial communities are best characterized by culture-independent methods.

**Method**: Maternal saliva was collected by four methods: 1) Spitting saliva into a 50 ml tube, 2) Salivette swab method 3) citric acid stimulated Salivette swab method and 4) cotton swab method. Infant saliva was only sampled using the cotton swab method. Plaque samples were obtained from the teeth of both the mother and children with a dental curette and suspended in 5ml of TE buffer (10mM Tris-Cl, 1mM EDTA, pH 8.0). DNA was extracted from the samples using the Epicenter MasterPure DNA Purification Kit and the MP Biomedicals Fast DNA Kit. The quantity and quality of the DNA isolated from these sources was examined by 3 methods: 1) measuring absorbance at 260/280 nm, 2) with agarose gel electrophoresis of DNA preparations, and 3) amplification of DNA by Polymerase Chain Reaction (PCR) with two different primer sets.

**Result**: The pure Saliva sample (50 ml tubes) yielded the highest absorbance. The 16S-23S primers gave about equal results from both the bead beater and the Epicentre methods of DNA extraction. The NanoDrop Spectrophotometer yielded the more reliable 260/280 absorbance readings.

**Conclusion**: Based on the results from PCR, it was concluded that neither the MP Biomedicals FastDNA Kit, nor the Epicentre MasterPure DNA Purification Kit worked consistently better. However, since the acceptable 260/280 absorbance ratio lies between 1.6 and 1.8 it was concluded that MP Biomedicals FastDNA Kit was a more consistent method.

**Funding**: Institute of Women’s Health: Community-Based Seed Grant 2009-2010
Objective: This research was designed to identify attitudes toward and knowledge about exercise and nutrition as well as current physical activity and eating practices in women and men with substance use disorders (SUDs).

Background: About 20 million Americans report using illicit drugs in the past month, and more than 50 million report problem drinking over that same time interval. Traditional therapies for SUDs have focused on treating withdrawal symptoms and encouraging abstinence from substance use. Often, these approaches are acute interventions, and long-term relapse rates in these patients remain high. Exercise affects both physical and psychological well-being, and used as an adjunct to traditional SUD treatment, may be beneficial in encouraging long-term abstinence from substances of abuse. In clinical studies, exercise has shown positive effects in tobacco smokers, alcohol users, polydrug users, and cocaine addicts with regard to abstinence rates, cravings, and withdrawal symptoms. While the data regarding the efficacy of exercise as adjunct to standard therapy in patients with SUDs appear promising, its effectiveness in clinical practice also depends on its acceptability to the target population. Little is known about these patients' willingness to adopt healthy lifestyles as an adjunct to standard SUD treatment.

Method: A computerized survey was developed, and to date, administered to 23 men and women receiving treatment for SUDs from community residential and outpatient treatment facilities. Participant demographic, substance use, nutrition, and exercise variables were examined.

Result: Participants were middle-aged (47.1/8.0), Caucasian (61%) and African-American (40%), women (70%) and men (30%) who smoked (78.3%) and used caffeinated products (95.7%). More women than men (81.3% vs 57.1%) were polydrug users, and the primary substances of abuse were alcohol and heroin for women and alcohol for men. Women were more likely than men to eat according to published guidelines, but men were more likely than women to exercise according to recommended guidelines. While nutrition and exercise knowledge was poor among all participants, almost all thought that nutrition and exercise are important in recovery from substance use.

Conclusion: Clearly, women and men with SUDs believe that nutrition and exercise are important to their recovery efforts, and interventions that focus on overall health in these patients potentially provide a unique opportunity to affect substance use behavior.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2009-2010
Poster Title: Back to Basics: Things One Needs to Know When Planning Multidisciplinary, Community-based Translational Research

Objective: To describe preliminary data from an IWH-CBPR study. Data collected supports Phase 1a of intervention development (Rounsaville, 2001).

Background: Cocaine Dependence is a chronic relapsing disorder that increases risks for comorbidities. Strategies for improving outcomes and preventing relapse are important for women, who are particularly vulnerable to the consequences of cocaine dependence (Najivits & Lester, 2008). One promising adjunct is physical activity (Petry, 2008). While physical activity has been associated with decreased craving and increased abstinence in cigarette smokers, few studies have examined its effects on recovery from cocaine. One factor that impedes such research is low levels of patient compliance with exercise protocols (Ussher, 2008). A 2008 NIH announcement encouraged grants on “Interactions between Physical Activity & Drug Abuse” and in response a multidisciplinary team assembled. Our existing partnership with Rubicon was integral to the project’s development. Though a literature review and discussions among researchers made it apparent that compliance with exercise was the critical barrier, working with our community partner demonstrated that other issues were of central importance.

Method: Preliminary data were collected (via anonymous surveys) from women enrolled in substance abuse treatment. Items included information about physical health, exercise experience and interest, and access to exercise equipment and gear. Data were summarized to better understand the barriers to regular exercise that exist.

Result: Preliminary analyses found several practical barriers to regular exercise. The majority of women in our target clinic reported no regular exercise in the 3 months prior to enrollment (56.5%). Thus, we selected treadmill walking as the target mode of exercise with an achievable goal (30 mins, 3 days/wk). Though over half of the women (52.2%) were “Very Interested” in regularly exercising, nearly half had never used a treadmill (43.5%) and the majority (73.9%) had not on a regular basis. Over a quarter (26%) did not have clothes that they could wear for exercising, and over a third (34.8%) did not have sneakers

Conclusion: Preliminary data identified practical barriers to regular exercise in a sample of cocaine-dependent women. Such barriers must be identified and addressed before the ultimate goal of improving compliance with an exercise regimen can be achieved.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2009-2010
Objective: The purpose of this project was to assess the feasibility and acceptability of a novel tai chi intervention as a self-care stress management strategy in women with increased risk for cardiovascular disease.

Background: Coronary heart disease (CHD) is the leading cause of death in women. Women tend to present with more advanced disease and experience increased mortality and morbidity compared to men. In addition to physiological indicators of increased CHD risk such as hypertension and diabetes, perceived stress, lower social support and socioeconomic status all significantly increase risk. Because CHD develops over decades, it is possible to decrease risk through lifestyle modification including effective stress management. The purpose of this project was to assess feasibility and acceptability of a novel tai chi intervention as a stress management strategy. A tai chi program was offered to women with increased CHD risk living in the Fulton Hill neighborhoods in order to establish a desirable, viable program in an existing community organization. Program evaluations and focus groups were used to refine the program for future research.

Method: This study was funded by the VCU Women’s Health Institute as a community based participatory research project. Women from the Fulton Hill neighborhoods aged 30-60 with a family history of cardiovascular disease were enrolled. They were asked to participate in a novel 12-week tai chi program. Following participation, feasibility and acceptability were assessed through program evaluation forms and focus groups.

Result: Data is being evaluated. Thus far, tai chi was found to be an acceptable form of stress management for women. Participants stated they remember to apply breathing and relaxation practices and principles learned in class regardless of the presence or absence of daily tai chi practice. This provides an interesting finding given the current scientific debate related to the effects of tai chi being a function of "dose" or frequency of practice.

Conclusion: Based on the evaluation data collected, refinements will be made in the tai chi intervention for use in an upcoming clinical trial to examine its effects on a variety of psychoneuroimmunological variables thought to impact the development of cardiovascular disease in women.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2009-2010
Poster Title: Are Young Adults Talking with their Mothers about Intimate Partner Violence?

Objective: The current study examines mother-young adult communication about intimate partner violence.

Background: Intimate partner violence (IPV) is a public health concern, particularly among young adults. Moreover, IPV is associated with increased risk of psychological and physical health problems (Coker et al., 2002). Strategies to decrease young adults' risk of IPV are needed. Research has shown that parents can influence the sexual attitudes, intentions, and risk behaviors of their children through the messages they convey (e.g., Schuster et al., 2008). Few studies, however, have examined communication about IPV between mothers and young adults.

Method: 249 young adults (mean age = 19) completed an online survey. The majority of participants were female (68%), White (59%), and in their first year of college (68%). Participants were asked whether or not they had ever talked to their mothers about: (a) the importance of not pressuring other people to have sex; (b) how to say no if someone wants to have sex and you don't want to; (c) what to do if your romantic partner physically threatens you; and (d) how to get help if your romantic partner physically abuses you. Participants also indicated whether or not they had ever had sexual intercourse and were in a romantic relationship.

Result: Mother-young adult discussions about IPV were not common: 35% of young adults talked with their mother about the importance of not pressuring other people to have sex; 41% about how to say no if someone is pressuring you to have sex; 39% about what to do if a romantic partner is physically abusive; and 39% talked about how to get help if they were physically abused by a romantic partner. Young adult women (compared to men) were significantly more likely to talk to their mothers about IPV. No differences in communication were found based on young adults' relationship status, race/ethnicity, or sexual behavior.

Conclusion: About 60% of young adults have not spoken with their mothers about IPV. These findings are concerning given the increased rates of IPV among young adults and highlight the need for family-based interventions aimed at increasing discussions about IPV.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2008-2009
Poster Title: Ethnic Identity, Gender Role Beliefs, and Drug use Among African American Women

Objective: To understand the conditions under which ethnic identity is linked to drug use for African American women.

Background: Ethnic identity has often been identified as one cultural factor that is protective against drug use (Belgrave et al., 1997; Brook, Duan, Brook, & Ning, 2007; Love, Yin, Codina, & Zapata, 2006); however, some studies have implicated ethnic identity as a contributor to drug use (Espinosa-Hernandez & Lefkowitz, 2009; Marsiglia et al., 2004; Zamboanga et al., 2009). We hypothesized that the relationship between ethnic identity and drug use would be fully mediated by gender role orientation.

Method: Participants included 562 African American women who responded to questionnaire items assessing Phinney’s (1992) Multigroup Ethnic Identity Measure (MEIM), the Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978), and past 30-day drug use.

Result: We employed structural equation modeling to test our model. The composite model displayed acceptable global fit. Ethnic identity predicted African American females’ identification with male gender roles. Identification with male gender roles was positively linked to perceptions of drug risk and past 30-day drug use. This relationship was not observed with female gender role beliefs. In addition, perceptions of drug risk was negatively linked to past 30-day drug use.

Conclusion: The results of the study provided support for the mediating role of a masculine gender orientation but not for a feminine gender role orientation in the relationship between ethnic identity and drug use. Programs that promote assertiveness training may need to be tailored within a framework that will help African American females use these skills in making decisions to refuse drugs rather than to use drugs as a source of empowerment. Overall, this research is important as it offers an alternative explanation to the relationship between ethnic identity and drug use.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2008-2009
Poster title: Health Care Provider Response to Perinatal Depression in Virginia

Objective: Health care providers in Virginia were surveyed approximately one year after the close of the funded Perinatal Depression Education campaign. The results from a previous baseline survey were compared with data from this follow-up survey with the objective of assessing both successes and challenges in meeting the mental health needs of pregnant and postpartum women throughout the Commonwealth.

Background: While we know that as many as 15-30% of all women may experience depression during pregnancy or the postpartum period, many of these women remain undetected or untreated. In 2005, an expert panel of academic and community providers developed a comprehensive survey as a component of a widespread perinatal depression education campaign based in Virginia. The prior study offers a baseline for understanding knowledge, practices, and systemic barriers to detection and treatment among health providers who work with women during this critical time period.

Method: This follow-up study was conducted as a direct replication of the earlier provider survey. Data was collected by VDH through mailed survey responses in a representative sample of 1,498 Virginia health care providers; data analysis was conducted by the primary author as external evaluator. All analyses were completed in SPSS/PASW 17.0.

Result: While there was overall improvement in knowledge and detection, there were distinct differences by specialization and discipline in screening, treatment and referral practices. Pediatricians were less likely than any other provider group to acknowledge a defined role in either detection or treatment/referral for perinatal depression. Significant system barriers were evident including a complex mental health referral process, time constraints, and available resources; this was more pronounced in rural areas.

Conclusion: The results of this follow-up evaluation help academic and policy leaders understand and improve both detection and treatment of perinatal depression among health care providers. Future educational efforts should vary by specialization and focus on alternative treatment options, ameliorating barriers, and promoting cross-disciplinary collaboration.

Funding: Institute of Women’s Health: Community-Based Seed Grant 2008-2009
Objective: The purpose of this study is to analyze the impact of various types of health care coverage on access to primary care for women.

Background: United States spends more on health care than any other nation. In 2009, health care costs reached $2.5 trillion, nearly 17 percent of the GDP. Despite this spending, health outcomes in the U.S. are far worse than in other countries. Access to primary health care is an indicator for a broader set of essential health services. It also reflects the provision of preventive care, which alone has the potential to lower the spending on costly medical care as proved from many scientific studies.

Method: Cross sectional study of 2007, National Ambulatory Medical Care survey (NAMCS). Survey analysis involving 9,972 (weighted n= 308,684) women aged 18 years and above. NAMCS is a national probability sample survey of visits to office-based physicians in the U.S. Analysis done using SAS version 9.2

Result: Using logistic regression, it was found that women with workers compensation were more likely to have no access to primary care as compared to those with private insurance (Adjusted OR =7.08 {95% confidence interval: 6.18-8.13}). Study results suggest that, a majority of women had private insurance (58%) and Medicare/Medicaid (35%) coverage followed by self-pay and others (3% each) with worker’s compensation (1%), the least. Further, 44% of women visited their primary care provider (PCP) for medical problems of acute nature followed by chronic problems (28%) and preventive care (28%). Interestingly, 65% of the women visited their PCP for preventive care as compared to 35% of the men.

Conclusion: Women with workers compensation fare worst when it comes to access to primary care as compared to population with other types of health coverage. This group is most likely to have no access to primary care as compared to those who have private insurance. Provision of universal health care coverage for all, alone may not solve the problem related to access of primary health care and the health care disparities may still exist despite policy makers effort to provide a universal health care coverage for all.
Poster Title: Physical Activity in Adult Women and Perceived Poor Social and Emotional Support

Objective: The main purpose of this study is to describe the effect of perceived poor social and emotional support on the prevalence of no leisure-time physical activity in adult women. Another objective of this study is to identify the role of other social and risky behaviors responsible for no physical activity.

Background: Recent estimates from CDC indicate that only 30 percent of women of age 18 years and above engage in regular leisure-time physical activity. Lack of physical activity is associated with increased risk of cardiovascular diseases, diabetes, metabolic syndrome, certain cancers, and shorter life expectancy. The Original Objective as stated in Healthy people 2010 reinforces the need to reduce the proportion of adults who engage in no leisure-time physical activity.

Method: Cross sectional study of 2008, Behavioral risk factor Surveillance system (BRFSS) Survey involving 258,513 women aged 18 years and above. BRFSS is a population-based list-assisted random-digit-dialed telephone survey of the noninstitutionalized U.S. adults. Analysis was done using SAS version 9.2. Main Outcome Measure: Self-reported responses on social and emotional support 'How often do you get the social and emotional support you need' as indicated on the BRFSS survey. The responses were summed and recoded into binary variables as yes and No.

Result: Using logistic regression, it was found that women who reported having no emotional and social support were significantly less likely to engage in leisure time-physical activity. (Adjusted odds ratio [OR] =0.65, 95% confidence interval [CI] = 0.64-0.67) as compared to women who received social and emotional support. Study results also suggest that smoking, heavy alcohol intake, education and presence of a living partner may significantly influence this association.

Conclusion: Women who reported having no emotional and social support were less likely to engage in leisure-time physical activity. Smoking, heavy alcohol intake, educational level and presence of a living partner may significantly influence the association between perceived emotional/social support and physical activity. These findings suggest that perceived social and emotional support along with other behavioral factors may be an important predictor of physical activity in adult women. More research is needed in future to support the evidence.
**Poster Title:** VCU School of Medicine Women Faculty Benchmarking: A 12-Year Trend Analysis

**Objective:** The objectives of this study are to describe the status of VCU-SOM women faculty, examine trends, and compare faculty data to the national averages.

**Background:** Faculty diversity in terms of gender and race is an ongoing challenge in academic medicine. The Committee on the Status of Women and Minorities (COSOWAM) at the VCU School of Medicine (VCU SOM) studies and encourages the progress of women and minorities. COSOWAM monitors faculty diversity and advancement trends and presents annual benchmarking data to the deans, chairs, and medical school faculty.

**Method:** A snapshot of full-time, ladder-ranked VCU SOM faculty data from 1997 through 2008 was analyzed. The data only included faculty who were full-time faculty at the main MCV campus location. To compare VCU SOM faculty to national averages, data were obtained from the annual Association of American Medical Colleges (AAMC) reports. The number and proportion of women faculty, time in rank, and tenure status were examined. Descriptive analyses, including chi-squares, were conducted to examine trends and gender differences.

**Result:** The proportion of women faculty increased from 30% in 1997 to 34% in 2008, which was consistently higher than the national averages. Notable gender differences were observed in academic ranking. In 2008, 53% of the women faculty were assistant professors compared to 37% of male faculty. However, only 20% of women were full professors compared to 35% of men. While a statistically significant gender difference in rank was observed in the clinical departments (p-value=<0.001), there was no difference in basic science departments (p-value=0.199). There was an overall significant difference in tenure status in 2008 by gender, with 21% of women faculty tenured compared to 35% of male faculty (p-value=<0.001). In basic sciences, tenure status was similar for men and women faculty while in clinical sciences, there were significant gender differences.

**Conclusion:** Although the VCU SOM fairs better than the national average in many categories, fewer women faculty in higher academic ranks, lower proportions who have tenure, and lower proportions of women overall, remain to be major challenges. Reasons for women to be in lower academic ranks as well as their rates of departure and advancement should be investigated.
**Poster Title:** The Effect of Moderate Intensity Exercise on Reducing Coronary Artery Disease among Smokers

**Objective:** It is of interest to determine whether moderate intensity exercise reduces the prevalence of CAD among smokers.

**Background:** Cardiovascular diseases, such as coronary artery disease (CAD), are the leading causes of death in the United States; in fact, more than 2,600 Americans die every day because of some form of cardiovascular disease. CAD can manifest itself differently in women compared to men due to differences in symptoms, validity of diagnostic tests, and disease progression. Nonetheless, research shows that tobacco smoking is strongly associated with the increased risk for myocardial infarctions and CAD whereas other studies have indicated protective effects of exercise on people from developing CAD. This study evaluates whether good behavioral lifestyle choices such as engaging in moderate intensity exercise moderates the biological effects of smoking in adults. Although many studies have examined the effects of exercise in adults with cardiovascular disease or in healthy individuals, few have demonstrated the effects of exercise among smokers and how it can reverse the negative consequences of smoking.

**Method:** Data was used from the 2007 Behavioral Risk Factor Surveillance System (BRFSS) results provided by the Center of Disease Control and Prevention (CDC). BRFSS provides surveillance data on health practices and risk behaviors related to diseases among the adult population (aged 18 and older) obtained through a phone survey. This cross-sectional study used data from a random sample of 51,802 eligible adult smokers. Results: Separate logistic regression models provided adjusted estimates of the association between moderate physical activity and prevalence of CAD. In 2007, adult smokers who had moderate intensity exercise were 22% less likely to report CAD than smokers with little or no moderate intensity exercise.

**Result:** Separate logistic regression models provided adjusted estimates of the association between moderate physical activity and prevalence of CAD. In 2007, adult smokers who had moderate intensity exercise were 22% less likely to report CAD than smokers with little or no moderate intensity exercise.

**Conclusion:** There is a need for more CAD research among women. Nonetheless, this study shows that moderate intensity exercise was associated with a lower prevalence of CAD among adult smokers. A longitudinal cohort study that studies the effects of exercise on incidence of CAD among female smokers may be appropriate.
18. Corcoran, Jacqueline, Professor, Social Work

Dattalo, Patrick, VCU School of Social Work, Meghan Crowley, VCU School of Social Work

Poster Title: Cervical Cancer Screening Interventions for U.S. Latinas: A Systematic Review

Objective: A systematic review and meta-analysis was undertaken to learn if interventions designed to improve Latina cervical cancer screening rates have been effective.

Background: Ethnic disparities exist for cervical cancer screening and cervical cancer death rates for Latinas when compared to other ethnic groups. For cervical cancer, the rate for Latinas is about twice that of non-Latinas and is highest out of all ethnic groups. The annual death rate from cervical cancer for Latinas is 24.2 out of 100,000 (McDougall, Madeleine, Daling, & Li, 2007). Cervical cancer, which is caused by a group of viruses called human papillomavirus (HPV), can be detected early through the Papanicolaou Smear (PAP). However, 18.9% of Latina-Americans and 16.8% of Latina immigrants had never had a Pap smear, even when served by a safety-net system for people with low income (Owusu et al., 2005). As the number of Latinos in the United States continues to grow, greater attention to ways to deliver effective medical care to this population is imperative.

Method: Both experimental and quasi-experimental were included, and were located through searches of relevant library databases and contact with primary investigators of studies, as well as handsearches of review articles. Data was extracted from primary studies and effect sizes (odds ratios) were computed and then pooled.

Result: Six studies met inclusion criteria. The total fixed effects odds ratio was larger than the odds ratio for the random effects model (0.783 versus 0.778), although analysis showed that more weight should be given to random effects.

Conclusion: The effectiveness of interventions to improve cervical cancer screening appear to have negligible results. Interventions may need to be delivered on a more long-term basis and future studies should strive for more methodological rigor.
Debra Kelly, RN, BSN, School of Nursing, Virginia Commonwealth University; Kristin Filler, RN, BSN, School of Nursing, Virginia Commonwealth University; Debra Lyon, RN, PhD, School of Nursing, Virginia Commonwealth University

**Poster Title:** Comparison of Measures of Distress in Women with Breast Cancer < Age 50 and ≥ Age 50 Prior to Chemotherapy

**Objective:** Distress is a significant aspect of breast cancer (BC) and its treatment and is often conceptualized as having components of anxiety (A), depression (D), pain (P) and fatigue (F). Data from a pilot study of symptom management in women with early stage BC [R21 CA106149, Lyon, D.E. PI] were used for a secondary analysis of symptoms related to distress. This analysis was guided by the following specific aims: 1) to examine levels of A, D, P and F reported in the original study; 2) to compare levels of A, D, P, and F in women < 50 and ≥ 50.

**Background:** BC continues to affect 1/9 women in the United States. With successful treatments, the focus has expanded to include long-term survival and attention to psychosocial phenomena, including distress. National and international organizations including the National Comprehensive Cancer Network, the Oncology Nursing Society, and PROMIS (Patient-Reported Outcomes Measurement Information System) have called for measures to assess and relieve distress.

**Method:** Prior to chemotherapy, demographic data and self report questionnaires (The Hospital Anxiety and Depression Scale, the Brief Pain Inventory and the Brief Fatigue Inventory) were collected in N=34 women between the ages of 27 and 63. To determine if age was associated with severity of symptoms, results for women < 50 and for those ≥50, were compared using JMP 8.0.2.

**Result:** Although analysis of distress in this population is difficult without a consistently used definition, levels of A, D, P and F are often measured as representative components of distress. Levels of A, D, P and F ranged from mild to moderate in this sample. There were no significant differences in the levels of individual symptoms between the age groups. Moderate, positive correlations were found for A and D in both groups. In women <50, AF, DP, DF, and PF had significant correlations.

**Conclusion:** Women of all ages in this study had at least mild levels of all symptoms. These data provide an indication for future research of components of distress in women with BC that should be directed towards assessment and relief of symptoms of distress.
Objective: In treatment-based studies of individuals with SUDs, comorbid Axis II Personality Disorders (PDs) may impact the course of the disorder and treatment outcomes (Verheul, 2001). The present study compared rates of treatment seeking in SUD women with and without any Axis II co-morbidity and for specific Axis II PDs. We hypothesized that females with Axis II disorders would be more likely to seek treatment and that treatment seeking would vary by PD.

Background: The co-morbidity of substance use and Axis II disorders is well-established. Population based studies have documented the co-occurrence of personality disorders (PD) and substance use disorders (SUD) in individuals but have not generally looked at how such co-occurrence might influence substance-abuse treatment seeking.

Method: Study participants were 4,843 women who met DSM-IV criteria for one or more Substance Use Disorder (current or lifetime) and were part of the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC). Of these, 1,330 also met criteria for Antisocial, Avoidant, Dependant, Obsessive-Compulsive, Paranoid, Schizoid, or Histrionic personality disorder (PD). Demographically, the participants were primarily Caucasian (69.4%) and a mean age of 40.3 years. SUD and PD were identified using the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule DSM-IV Version (AUDADIS-IV). Treatment seeking behavior was based on self-report of previous treatment for substance use. Categorical measures were compared using chi-square analyses.

Result: Preliminary analyses found that among females with alcohol use disorders (AUD), (N=3,176), those with co-morbid Axis II PDs (N=1,188) were nearly twice as likely to seek treatment (23.7%) compared to those with AUDs alone (11.4%) (p<.001). Similarly, among females with other SUDs (N=3,513), a co-morbid PD increased the probability of treatment seeking more than two-fold (24.4% vs 11.5%; p<.001). Subsequent analyses will examine these relationships by gender, and type of PD to determine if different patterns are seen for various subgroups.

Conclusion: Preliminary findings suggest that a co-morbid PD in females with alcohol and other SUDs is associated with a 2-fold higher rate of substance abuse treatment seeking. Future research should examine ways to improve treatment services for this population to help address how personality factors impact treatment.
22. Ethiraj, Sinduja, MS student, Radiation oncology
Dr. Aylin Rizki, Assistant professor, Dept. of radiation oncology, Massey cancer center, VCU

**Poster Title:** Regulation of DNA Double-Strand Break Repair by E-cadherin signaling in Breast Cells

**Objective:** To determine the involvement of E-cadherin, a protein that is found frequently downregulated during breast cancer progression, in regulating DNA double-strand break repair which is a process required for maintaining genome stability.

**Background:** Our laboratory previously demonstrated that extracellular matrix (ECM) signaling via beta1 integrin regulates homologous recombination (HR) which is an error-free double-strand break repair pathway. Interestingly, when cells from breast epithelial tissue are taken out of the tissue and cultured as single cells, ECM down-regulates HR but ECM signaling up-regulates HR in both human and mouse mammary epithelial cells that have 'correct' in vivo-like cell-cell junctions. Based on the observation that single cells and junctioned cells respond to ECM in the exact opposite manner, we hypothesized that ECM signaling may interact with cell-cell junction signaling pathways in regulating DNA repair. To test this hypothesis, we asked whether the main breast epithelial adherens junction cadherin, E-cadherin, is involved.

**Method:** We blocked E-cadherin using a function blocking monoclonal antibody MB2 and examined its effect on DNA repair proteins using indirect immunofluorescence and western blot. HR is determined using transgenic human breast epithelial cells containing a GFP-based direct-repeat substrate, allowing us to measure HR by FACS.

**Result:** Indirect immunofluorescence showed that in the E-cadherin blocked non-tumorigenic breast epithelial cell line HMT-3522 S1 there is an upregulation of nuclear gamma-H2AX and RAD51, as well as an increase in the proliferation marker Ki67. Furthermore, in these blocked cells we were able to see lower levels of beta-catenin near the cell membrane and an increase in its levels inside the cell especially in the nucleus. The latter has been confirmed also by western blot technique comparing the nuclear and cytoplasmic fraction expression. In addition, western blots showed that total RAD51 level is down-regulated by E-cadherin blocking. Preliminary observations show that MB2 significantly down-regulates HR. Functional interactions among RAD51, E-cadherin, beta-catenin, ECM and HR are currently being investigated further.

**Conclusion:** Results show a role for adherens junction signaling in a DNA repair process that is significant for breast cancer progression.
Poster Title: Autophagic Potentiation of Radiosensitization by Vitamin D3 and the Analog, EB1089

Objective: Our current studies are designed to investigate the nature of cell death when 1-25 Vitamin D3 (1,25D3) is utilized to enhance sensitivity to fractionated radiation (FIR) in the MCF-7, BT474, and Hs578t breast cancer cell lines.

Background: While chemotherapy and FIR treatment may be initially effective at suppressing breast cancer growth, disease recurrence and tumor metastasis are major problems in the clinic. A number of strategies have been developed in an attempt to enhance the response to radiation and prevent tumor cell recovery by interfering with cytoprotective signaling.

Method: Fluorescence staining, RNA interference, Western blotting

Result: Previous studies in our laboratory indicate that a 72 hour exposure of MCF-7 cells to 100nM of the Vitamin D3 analog, EB1089, prior to 5x2Gy FIR resulted in an 80% reduction in viable cell number over 96 hours post-irradiation. Although apoptosis, mitotic catastrophe and senescence are all evident under these experimental conditions, our studies strongly suggest that autophagy plays a central role in the radiosensitization effects of EB1089.

Conclusion: Vitamin D irreversibly commits MCF7 breast tumor cells towards cell death upon subsequent exposure to irradiation. Inhibition of autophagy drives the cell towards alternative modes of cell death, primarily apoptosis (but possibly mitotic catastrophe). EB1089 and 1,25D3 may prove to also promote sensitivity to radiation in breast tumor cells that are intrinsically resistant to treatment through the overexpression of cytoprotective signaling pathways.
Regular Coffee Consumption Leads to Problem Alcohol Use in College Females

Objective: The present study examined the relationship between daily coffee consumption and alcohol use/problems in a sample of college women.

Background: Coffee is the most widely consumed psychoactive beverage in the US; 57% of Americans reporting daily use. While some studies suggest coffee drinking may contribute to the development of problem alcohol use, findings are mixed indicating the need for more research. Over 80% of college students consume alcohol, and 50% binge drink. Adverse consequences related to alcohol use are substantial, with college drinking contributing to 1,700 deaths, 599,000 injuries, 97,000 sexual assaults and 2.8 million DWIs annually (Hingson, 2005).

Method: In 2001-02, 367 undergraduate psychology students from an urban university completed a battery of questionnaires and received extra credit as compensation for their time/effort. All procedures and measures were approved by the university’s IRB. 63 subjects reported drinking coffee daily (DCof; 17%), and 304 reported not drinking coffee daily (NDCof; 83%). Chi-square and t-test analyses were used to compare the 2 groups for recent (past month and past year) alcohol use patterns and problems, looking separately at weekday and weekend drinking.

Result: Participants were Caucasian (59%) and African American (24%) women ranging in age from 18-32 years (mean 20.4). While DCof and NDCof women did not differ in quantity and frequency of weekday alcohol consumption, group differences were found for weekend drinking. Specifically, DCof women reported consuming a higher average number of alcohol-containing drinks on a single weekend day than NDCof women (3.9 vs 3.0, p<0.05). The largest number of drinks consumed on a single weekend day was also higher for DCof women compared with NDCof women (5.0 vs 3.8, p<0.05). Finally, DCof women reported needing to drink significantly more alcohol in order to fall asleep or pass out than NDCof women (8.2 drinks vs 7.0, p=0.05).

Conclusion: Preliminary findings support a relationship between regular use of coffee and higher levels of weekend alcohol consumption and problem alcohol use (tolerance) in college women. These findings have important implications given the recent proliferation of caffeine-containing energy drinks and marketing of these drinks that specifically targets young adults. Additional analyses will examine alcohol-related problems, family history measures and other substance use (e.g., tobacco).

Support: NIDA R01DA026091 and NIAAA F31AA013771
Poster Title: Characterization of Active Transport in the BeWo Cell Line

Objective: The BeWo cell line will be characterized by ABC efflux transporter expression and activity. These determinations can then be compared to published data for the human placental barrier.

Background: The kinetics of drug distribution between the maternal and fetal compartments in human pregnancy are important to understand, but can be difficult to measure. Passage across the syncytiotrophoblasts, a cell population which is situated as a tight junction epithelial barrier between the maternal and fetal circulation, is the main consideration for determining fetal exposure to drug molecules. In vitro models of this barrier can be used to simulate the physiologic reality. The immortalized BeWo choriocarcinoma cell line has been previously shown to express some ATP-binding cassette (ABC) efflux transporters.

Method: Reverse-transcriptase polymerase chain reaction (RT-PCR) was performed to qualify whether mature mRNA is expressed in BeWo cells for various ABC transporters - MRP1, 2, 8, BCRP, and PGP. Next, PGP, BCRP, MRP2, and MRP8 protein expression were analyzed in BeWo by cell lysis and subsequent western analysis with an immunoblot. Last, active transport activity was assessed in BeWo cell culture by using DNP-SG, a model compound for efflux of electrophilic glutathione conjugates. Various inhibitors of ABC-mediated transport were applied to the DNP-SG experimental system to quantify a change in transport activity and to compare this to previously published data for placental villous tissue (PVT) fragments.

Result: MRP1, 2, 8, and BCRP were all confirmed to have mRNA present in BeWo cells by RT-PCR. BCRP, MRP2, and MRP8 were all detected by Western Blot. PGP expression is at or below the limit of detection. Time and concentration dependence of DNP-SG efflux were confirmed as expected for protein-mediated transport. The inhibition data set must be supplemented before comparisons can be made with PVT.

Conclusion: These data help to establish the utility and limitations of the BeWo cell line as a model for ABC transporter-mediated efflux in the placental syncytiotrophoblasts. Additional studies may include quantitative PCR of transporter expression and silencing RNA knock-down of individual transporters and subsequent measurement of DNP-SG transport. These determinations and the other methods discussed above could also be performed with primary placental cytotrophoblasts and comparisons made with the BeWo line.
27. Liu, Renyan, M.Sci, Radiation Oncology
Aylin Rizki, PhD, Assistant Professor, Department of Radiation Oncology, MCV, VCU

**Poster Title:** ICAP1 and Rho Kinase Signaling in DNA Double-Strand Break Repair in Breast Cells

**Objective:** To study the cytoplasmic signaling mechanisms that mediate the effect of extracellular matrix (ECM) signaling on DNA double-strand break repair in breast cells.

**Background:** Extracellular microenvironment plays important roles in maintaining genome stability in both human breast cells and in normal mammary cells. A variety of DNA repair pathways contribute to genome stability. One of these is homologous recombination (HR), which is an error-free double-strand break repair mechanism. Recent studies from our laboratory have documented that extracellular matrix (ECM) can regulate HR in a context dependent manner. When there are proper cell-cell junctions, ECM up-regulates HR; while in the absence of junctions, ECM down-regulates HR. ECM signals via β1 integrin to regulate HR. This regulation is independent of the previously reported regulation of HR by cell cycle components, with highest HR observed in the G2/M phase of the cell cycle. ICAP1 (Integrin cytoplasmic domain-associated protein-1) may be negative regulator of β1 integrin and downstream Rho kinase signaling pathways. It interacts with Rho kinase ROCK1 and translocates it to membrane ruffles and retraction fibers. ICAP1 itself also translocates to the nucleus and thus is considered important in transducing β1 integrin mediated ECM signaling to the nucleus.

**Method:** We used siRNAs against ICAP1 and two chemical inhibitors of ROCK1 in non-tumorigenic breast epithelial cells. We also produced and expressed mutants of ICAP1 that abolish its interaction with beta1 integrin. To determine HR, cells transgenic for a direct-repeat recombination substrate which allows determining HR frequency by counting GFP fluorescent cells by FACS is used.

**Result:** Both chemical inhibitors of ROCK1 downregulated HR in the absence or presence of ECM, suggesting ROCK1 as a positive modulator of the ECM effect on HR, as well as functioning in modulating HR in the absence of ECM. These experiments were done with junctioned cells and in the presence of EGF which allows them to grow. In the absence of EGF and therefore non-dividing cells, ICAP1 siRNAs upregulated HR. However, in the presence of EGF when cells were allowed to grow, ICAP1 siRNAs either up or downregulated HR most likely due to the growth status of the cells. This is consistent with the effects of ICAP1 on proliferation as a negative modulator of the beta1 integrin effect which is also dependent on its translocation to the nucleus.

**Conclusion:** By demonstrating the involvement of ROCK1 and ICAP1 in regulating HR, this project contributes to understanding a pathway significant for breast cancer progression.
Poster Title: Biobehavioral Relationships in Fibromyalgia Syndrome

Objective: The purpose of this biobehavioral pilot study was to examine and characterize the relationships among perceived stress, symptoms of pain, fatigue, mood and immunologic markers in women diagnosed with fibromyalgia.

Background: Fibromyalgia (FMS) is a chronic wide-spread pain and fatigue syndrome that affects 3 to 6 million adults in the United States. One of the theories of the pathophysiology in FMS is that immune activation associated with cytokine dysregulation leads to disturbances of the hypothalamic-pituitary-adrenal (HPA) axis. Consequently, cytokines have been considered as possible biomarkers of FMS. Because symptoms of fibromyalgia may be worsened by perceived stress and influenced by interactions of psychobiological processes, further understanding the relationships among fibromyalgia symptoms, perceived stress, and psychoneuroimmunology (PNI)-based biomarkers is needed.

Method: Using a cross-sectional, correlational design, 50 women diagnosed with fibromyalgia completed the Perceived Stress Scale (PSS); the Brief Pain Inventory (BPI); the Brief Fatigue Inventory (BFI); the Center for Epidemiological Studies-Depression (CES-D) scale; the State-Trait Anxiety Inventory (STAI). Plasma levels of 17 cytokines were analyzed using the Bio-Plex (Bio-Rad; Hercules, CA). Levels of C-reactive protein (CRP) in plasma were determined using a high-sensitivity ELISA assay (ALPCO).

Result: Levels of stress were significantly correlated with pain, fatigue, mood and anxiety while negatively correlated with levels of interleukin (IL)-1β and monocyte chemotactic protein (MCP)-1. Levels of pain were significantly correlated with fatigue, mood and anxiety; positively correlated with macrophage inflammatory protein (MIP)-1β and negatively correlated with levels of IL-1β. Levels of fatigue were significantly correlated with pain, mood and anxiety and negatively correlated with IL-1β, IL-10 and granulocyte-colony stimulating factor (G-CSF).

Conclusion: Because stress may be a risk factor for, or a mediator of, the onset or maintenance of the symptom cluster in persons diagnosed with FMS, expanded understanding of biobehavioral relationships may lead to targeted interventions for symptom management. Study findings lend support for expanded testing of the PNI framework.
Poster Title: A Mouse Mammary Gland Model for Studying Beta1 Integrin Signaling Effects on DNA Double-Strand Break Repair

Objective: To develop mouse models for examining the effects of extracellular matrix (ECM) signaling on DNA repair in the mammary gland, an in vivo microenvironment for modeling the human breast.

Background: Cell adhesion to ECM is mediated by the integrin family and modifies ionizing radiation (IR) sensitivity in several cell types, including cancer cells. In particular, beta1 integrin signaling has been implicated in cancer progression, metastasis, and resistance to radiation therapy. In addition, our laboratory showed that ECM signaling via beta1 integrin regulates homologous recombination, as well as IR induced foci formation kinetics of DNA damage response and repair genes gamma-H2AX, RAD51, and MRE11 in a human breast epithelial cell model, and in primary mouse mammary epithelial cell organoids. This direction of the ECM response depended on whether cells were single or had normal cell-cell junctions. Therefore, we hypothesize that the tissue microenvironment plays an important role in mediating the role of beta1 integrin and propose to develop in vivo models for studying it.

Method: Beta1 integrin is manipulated by either intraperitoneal injection of function-blocking antibody Ha2/5 or by ablating the ITGB1 gene using the Cre/loxP recombination system. Cre endonuclease is delivered by up-the-teat injections into 8-12 week old pre-pubertal mice. Foci are detected by indirect immunohistochemistry of frozen mammary gland tissues at time points taken after 6 Gy IR and quantified by counting Z-stacks of confocal images.

Result: For determining the beta1 integrin effect on foci kinetics, we irradiated wild type mouse mammary glands in the Ha2/5 presence and absence and determined the level of gamma H2AX and RAD51 foci formation by counting Z-stacks of confocal microscopy images. We found that blocking of the beta1 integrin receptor altered RAD51 foci formation by time-dependent manner. In transgenic ITGB1 knockout mouse model Cre recombinase was successfully delivered to the ductal epithelial cells by up-the-teat viral injection, and resulted in ITGB1 gene deletion in ~80% of the organoids isolated from mice subjected to the up-the-teat injection.

Conclusion: We successfully developed mouse models to study the effects of IR on DNA double-strand break repair protein foci formation in the mouse mammary gland.
Poster Title: Matrix Metalloproteinase-1 Enhances Vessel Reactivity to Angiotensin II and causes Dose Dependent Vasoconstriction via Protease Activated Receptor-1 and Endothelin-1.

Objective: To investigate the role of matrix metalloproteinase-1 (MMP-1) in enhancing vessel reactivity to angiotensin II and causing dose dependent vasoconstriction in preeclampsia.

Background: We recently reported increased protein and mRNA expression levels of MMP-1 in omental vessels from preeclamptic women as compared to normal pregnant women.

Method: Endothelium intact human omental vessels (200-500µ) obtained at term Cesarean section, were mounted on the DMT myograph system at 37 °C with an inlet pressure of 45 mmHg and an outlet pressure of 42 mmHg. Each vessel was perfused with activated MMP-1 in the dose range of 0.025 ng/ml to 25 ng/ml. Dose response to angiotensin II (10^-9M to 10^-5M) was obtained with perfusion of 2.5 ng/ml of activated MMP-1. Omental vessels and vascular smooth muscle cells were incubated with MMP-1 with or without SCH-79797, a specific protease activated receptor-1 blocker. Supernatants assayed for human endothelin-1 using a chemiluminescent ELISA kit. MMP-1 was activated using amino-phenyl mercuric acetate (APMA). APMA was removed by dialysis after MMP-1 activation.

Result: Dose dependent vasoconstriction to MMP-1 was seen in endothelium intact vessels. Vasoconstrictive response to MMP-1 was abolished by co-perfusion of 10^-7M SCH-79797 or 5 µM BQ-123, a specific endothelin-1 type A receptor blocker (0.025 ng/ml, p>0.05; 0.25 ng/ml, p<0.05; 2.5 ng/ml, p< 0.01; 25 ng/ml, p< 0.01). Perfusion of 2.5 ng/ml of activated MMP-1 significantly enhanced vessel reactivity to angiotensin II (10^-9M, p<0.05; 10^-8M, p<0.05; 10^-7M, p<0.01; 10^-6M, p<0.05; 10^-5M, p<0.05). SCH-79797 and BQ-123 blocked MMP-1 induced vasoconstriction and enhanced reactivity to angiotensin II.

Conclusion: MMP-1 increased vessel reactivity to angiotensin II and caused dose dependent vasoconstriction in endothelium intact human omental vessels via protease activated receptor-1 mediated endothelin-1 acting via endothelin-1 type A receptor.
31. Moore, Thomas, Mr., Department of Psychology
Pamela M. Dillon, PharmD, Research Liaison, Center for Clinical and Translational Research, Dace Svikis, Ph.D., Professor, Department of Psychology, Deputy Director, Institute for Women’s Health, Director, Addiction and Women’s Health: Advancing Research and Evaluation (AWHARE)

Poster Title: Acceptability to Women of a Guided Computerized Health Screening in Primary Care

Objective: Assess the acceptability of a proactive, computer-guided health screening and assessment program that was implemented for the detection of smoking, alcohol and drug use behaviors in primary care patients. The pilot data evaluating the acceptability of the computer-guided program is presented here.

Background: Screening, brief intervention, and referral to treatment (SBIRT) is an evidence-based approach to the delivery of early interventions for persons at risk for substance use disorders. Efforts to incorporate SBIRT into primary care settings have proven difficult.

Method: A computer-delivered SBIRT program was developed and piloted in 123 patients, the majority attending an urban, academic medical center primary care clinic. Participant acceptability data were collected via the computerized program itself and through focus groups.

Result: Participants were African American (53%) and Caucasian (37%), men (35%) and women (65%), with an average age of 45 years. The computerized screening was rated satisfactory by a majority of the women, with 78% identifying it as ‘very acceptable’, and only 7% classifying it below ‘acceptable’. Working with the program was identified as ‘very easy’ by 90% of the female participants. The program was rated acceptable across all education levels. Acceptability and satisfaction for men was comparable or below those of the women who completed the same computer guided intervention. Acceptability by age group showed that 84% of those over 45 years found working with the computer ‘very acceptable’ and 71% of people under the age of 45 found working with the program ‘very acceptable’.

Conclusion: For the majority of women, a guided computerized health screening and assessment program in a primary care setting was rated as an acceptable method to identify and evaluate substance use. Future studies should continue to look at the feasibility of computerized screenings and their acceptability to patients.
Objective: The present study examined gender differences in prevalence rates of drug use and psychological problems in youth from Uruguay.

Background: The National Drug Assembly of Uruguay is working to develop gender-specific drug abuse policies. Through qualitative research and pilot studies of programs that target the unique needs of women/girls in Uruguay, the Assembly hopes to use empirical data to inform policy development. To support this agenda, the present study compared prevalence rates for substance use and psychological problems in male and female adolescents.

Method: Three epidemiological data sets from Uruguay were examined, including the: Global Youth Tobacco Survey (GYTS) (N=3,425 participants); Global School-based Student Health Survey (GSHS) (N=3,406 participants); and OUD 3rd National Survey of Secondary Students and Drug Consumption (N=6,770). Chi-square analyses were used to compare prevalence rates in male and female youths on target measures.

Result: For substance use, smoking was more prevalent among girls than boys in both the GYTS (24.6% v 19.7%, respectively) and GSHS (21.4% v 13.3%, respectively) surveys. Tranquilizer use (without a prescription) was also more prevalent among girls (11.8%) v. boys (6.6%). In the mental health domain, girls were more likely than boys to report depression (23.9% v. 12.8%); loneliness (11.2% v. 4.5%); concern or worry (8.8% v 4.3%); and fear (4.6% v. 2.2%)

Conclusion: In Uruguay, girls were more likely to report smoking and tranquilizer use than boys. They were also more likely to report a variety of psychological problems. Study findings support the need for further research focused on unique needs of girls and identification of the most effective programs and services to meet their needs.
**Poster Title**: Does Education Play a Role in Women's Mental Health Status?

**Objective**: The purpose of this study is to quantify to what extent low education levels resulted in self-reported poor mental health among women in the United States in 2007.

**Background**: Approximately 12 million women suffer from depression each year, and one in eight women will become depressed in their lifetime. Studies have linked education and depression, but those studies have not been gender specific. More specific risk factors for female depression correlates with more focused primary prevention.

**Method**: The study design was Cross-sectional, and used data from the 2007 Behavioral Risk Factor Surveillance System (BRFSS). BRFSS is a state-based system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. The inclusion criteria are as follows: 1) participants must have been females who responded to the 2007 Behavioral Risk Factor Surveillance System (BRFSS), 2) participants must have answered all questions relating to the variables of interest. In total, N=63,541, women were eligible, and included in the study. Logistic regression models were used to quantify to what extent low education levels resulted in self-reported poor mental health among women in the United States.

**Result**: The data suggests that women who have a high school education level or below, have 1.28 times the odds of having poor mental health, as compared to those women who have a college level education and beyond (95%CI [1.20, 1.37]).

**Conclusion**: The results of this study suggest that women who hold a lower educational level have significantly higher odds of suffering from 16 or more days of stress, depression, and emotional problems, than those women with a higher educational attainment. This study adumbrates the potential role of education as a risk factor for emotional problems and poor stress coping abilities among women.
**Poster Title**: A Pilot Phase II Trial of Magnesium Supplements to Reduce Menopausal Hot Flashes in Breast Cancer Patients

**Objective**: To test if oral magnesium would reduce hot flashes in breast cancer survivors.

**Background**: Hot flashes affect up to 40% of cancer survivors. Magnesium has anecdotal evidence of effect.

**Method**: Breast cancer patients with at least 14 hot flashes a week were given magnesium oxide 400 mg for four weeks, escalating to 800 mg if needed. Hot flash score (frequency x severity) at baseline was compared to the score at the end of the 5 weeks using a one-sided paired t-test. Trial NCT01008904.

**Result**: Of 29 who enrolled, 25 women completed treatment. The average age was 53.5 years, 6 patients were African-American, the rest Caucasian. Of the 29, 8 were on tamoxifen, 9 were on aromatase inhibitors, and 14 were on anti-depressants. 17 patients escalated the magnesium dose after two weeks of treatment. Hot flash frequency was reduced from 52.2 (13.7) to 27.7 (5.7), a 41.4% reduction, p=0.009. Hot flash score was reduced from 109.8 (40.9) to 47.8 (13.8), a 50.4% reduction, p=0.02. Of 25 patients, 14 patients (56%) had a >50% reduction in hot flash score, and 19 patients (76%) had a >25% reduction. Side effects were minor: 2 women stopped the drug for adverse effects including 1 person with migraine headache and 1 with nausea. Compliance was excellent and many patients continued treatment after the trial.

**Conclusion**: Oral magnesium appears to have helped more than half of the patients and was well tolerated. Side effects and cost ($0.02/tablet) were minimal. A randomized placebo-controlled trial is planned.
Poster Title: Perceived realism of television and risk for HIV: Does being sexually active play a role in determining risk perceptions?

Objective: To examine the relationship between perceived realism of television shows and perceived risk of contracting HIV in young adult females.

Background: Young adults turn to media sources to learn about sexual behaviors and practices, which in turn inform their attitudes about sex. Moreover, viewers' perceptions of the realism of television shows influence the relationship between media and sexual risk attitudes. For example, Ward and Rivadeneyra (1999) found that college students who rated television clips with sexual content as more realistic endorsed more permissive sexual attitudes. This study will examine whether the link between television realism and HIV is affected by a young woman's sexual activity or romantic relationship status.

Method: 164 young females (M = 18.8, SD = 1.46) completed a confidential, online survey. The majority of participants were in their first year of college (68%) and 58% of participants were White. Participants completed three measures to assess sexual risk behavior, perceived realism of television, and perceived risk for HIV.

Result: Among participants who had never had sexual intercourse, females who perceived television as more real were more likely to believe that they were at reduced risk for contracting HIV (r = -.317, p = .036). This finding, however, was not significant for females who reported having had sexual intercourse.

Conclusion: The results of this study have noteworthy implications for HIV prevention interventions that focus on the impact of the media on female risk. Importance should be given to female viewers' sexual activity status since those who are not yet sexually experience are more likely to perceive the images portrayed on television as resembling reality while females who are sexually active are not. Television does not generally portray the negative consequences of unprotected sexual activity and thus females students who adopt the messages presented on television as their own (i.e. consequence free-sex) are more likely to believe they are less at risk for contracting HIV than those students who are sexually active but also perceive television as real. It may be that females who are sexually experienced gain information about risk from other sources, such as partners and other sexually active peers.
36. Saccoccio, Frances, MD/PhD Student, Department of Microbiology & Immunology
Xiaohong, Cui, Department of Pediatrics, Virginia Commonwealth University School of
Medicine; Michael A., McVoy, Department of Pediatrics, Virginia Commonwealth University
School of Medicine

Poster Title: Development of a Cytomegalo Virus Vaccine Using Viral Proteins UL128-131

Objective: To determine if immunogens based on cytomegalovirus (CMV) proteins UL128-131
can elicit antibodies that block CMV infection of epithelial cells.

Background: Development of a vaccine to prevent congenital CMV infection will have a major
impact on women’s health. CMV causes congenital infection in 0.7% of live births in the U.S.
and is the most common cause of congenital long-term sequelae. The CDC estimates a 30-40%
risk of a fetus developing congenital CMV in sero-negative women that become infected with
CMV while pregnant. CMV vaccine development to date has failed to provide an effective
prophylaxis. These failures may be related to pre-clinical research being conducted solely in
fibroblast cell lines. The viral proteins UL128-131 are necessary for efficient entry into
epithelial and endothelial cells but are not required for entry into fibroblasts. The unique virus
entry specific properties of UL128-131 provide a solid basis for the investigation of these
proteins in CMV vaccine development.

Method: In collaboration with Vical Inc., mice are being immunized with plasmid DNA coding
for UL128-131 formulated with Vaxfectin, a novel lipid-based vaccine adjuvant. Mice are also
being immunized with CMV virions that either express or lack the UL128-131 complex in the
virion. The ability of mouse sera to neutralize CMV entry into human epithelial cells will be
explored.

Result: UL128-131 DNA-vaccine vectors were constructed and protein expression was
confirmed by western immunoblot. Immunization with the DNA-vaccine formulated with
Vaxfectin was well tolerated in the 20 female Balb/c mice vaccinated to date. Additionally, the
Towne strain of CMV, which does not express the UL128-131 complex, was repaired so that the
complex is present in virions. The presence or absence of UL128-131 in virions was confirmed
by western immunoblot.

Conclusion: CMV proteins UL128-131 contain epitopes for neutralizing antibodies that can be
utilized as a novel approach for CMV prophylaxis. A successful CMV vaccine has the potential
to drastically decrease the rate of congenital abnormalities resulting from pregnancies of
otherwise healthy women.
Objective: To determine the role XRCC3 plays in breast cancer cell invasiveness and to delineate the mechanism by which it does so.

Background: Acquisition of invasiveness through extracellular matrix (ECM) is a crucial characteristic of transition to malignancy in the breast. Previously, we found some genome stability regulators to be involved in mediating breast cell invasiveness. Using a breast cell progression model in culture, we found that XRCC3 protein level is progressively downregulated in transition to invasiveness. XRCC3 is a member of the RAD51 family of proteins playing a central role in homologous recombinational repair of DNA. Polymorphisms in XRCC3 have been associated with increased breast cancer risk, but some have been found to be functional for HR. These data led to the hypothesis that XRCC3 may have alternate functions contributing to breast cancer progression. We examined its role in invasion.

Method: Downregulation of XRCC3 was achieved by using siRNAs. Overexpression was achieved by retroviral transduction of a construct expressing XRCC3 from a CMV promoter. XRCC3, FAK, and phospho-FAK-Y397 levels were determined by Western blotting. The ability of the cells to invade through ECM was quantified using tranwell-based Boyden chamber assays.

Result: Overexpression of XRCC3 in the invasive T4-2 cells downregulated invasion significantly. Downregulation of XRCC3 upregulated invasiveness in T4 cells. This was not due to an effect on cell viability as shown by MTT assays during the course of the invasion assays. To determine whether the effect of XRCC3 on invasion is mediated by altering secreted factors, conditioned medium from T4-2 cells treated with XRCC3 siRNAs was added to T4-2 cells. Interestingly, XRCC3 downregulation rendered the conditioned medium more highly capable of inducing invasiveness. To determine if canonical adhesion pathways that function in invasion are altered by XRCC3, we examined the effect of XRCC3 downregulation on Focal Adhesion Kinase (FAK) and its autophosphorylated form phospho-FAK-Y397 that is necessary for activating the FAK signaling cascade. We found that downregulating XRCC3 upregulated autophosphorylated FAK.

Conclusion: XRCC3 is a negative regulator of invasion which functions by altering the secreted factors and adhesion pathways important for breast cell invasiveness.
Objective: Examine the mechanism by which double-stranded RNA (dsRNA), an innate immune receptor ligand, effects the survival of ovarian cancer cell lines alone and in conjunction with accepted/traditional chemotherapeutics.

Background: Ovarian cancer is the most lethal of all gynecological cancers. Current ovarian cancer drug regimens, including taxanes and platinum-based agents, are susceptible to chemoresistance necessitating the development of novel chemotherapeutics. Within tumors pathogen-derived ligands, such as dsRNA, can activate pattern recognition receptors (PRRs) that are capable of inducing apoptosis. We have found in ovarian cancer cell lines that dsRNA treatment alters cell survival.

Method: Cell-based assays were used to determine responsiveness to dsRNA and/or chemotherapeutics. Expression levels of key dsRNA-responsive mediators were determined via Western blot and qRT-PCR.

Result: When treated with dsRNA, ovarian cancer cell lines and patient samples could be divided into two categories, significant levels of apoptosis (responsive) or unaffected (non-responsive). NF-kappaB activation, measured via subunit p65 phosphorylation in response to dsRNA treatment, was intact in all cell lines while caspase-3 cleavage only occurred in responsive cell lines. Responsive samples showed increases in dsRNA responsive PRR expression, IFN-beta production and STAT1 Y701 phosphorylation. Dual therapies, comprised of an HDAC inhibitor or platinum-based agent plus dsRNA, worked synergistically to increase cell death in dsRNA non-responsive cell lines.

Conclusion: dsRNA can induce apoptosis in a sub-population of ovarian cancer cell lines and patient samples. Combining dsRNA with other chemotherapeutics synergistically increases the apoptotic response. This novel dual therapy, innate immune ligand plus cytotoxic agent, may find application in chemoresistant ovarian cancers. Funding provided by the National Cancer Institute and the Jimmy V Foundation.
Poster Title: One Tiny Reason to Quit: A Prenatal Smoking Cessation Campaign in Richmond, VA

Objective: To describe a community outreach campaign aimed at encouraging pregnant African American women to call an evidence-based quitline for smoking cessation services and support.

Background: In Richmond, VA, rates of infant mortality (IM) are 4-5 times higher among African-Americans (AA) than among whites. A prevention communication campaign was planned as part of a large research center initiative to address this disparity. Two years of community-based participatory strategic planning and formative data gathering led planners to a smoking cessation focus and identified effective communication channels. The resulting intervention, One Tiny Reason to Quit, was a social marketing campaign encouraging pregnant AA women to call 1-800-QUIT-NOW for smoking cessation counseling and support.

Method: The campaign ran from late June through September 2009 and utilized a two-pronged communication strategy, media and face-to-face outreach. Radio ads were placed on an urban contemporary station, print ads ran in city buses, and billboards were displayed in high-risk communities throughout Richmond. Fifty outreach workers were recruited from local organizations that serve at-risk pregnant women and trained to deliver campaign messages, distribute branded give-away items, and arrange to have posters displayed in community venues frequented by target audience members.

Result: Effects of the campaign were assessed using calls to the quitline. The number of calls from pregnant women during the 3-month campaign increased 137% over the same 3-month period the preceding year, a comparison period that adjusts for seasonal fluctuations in call volume (Wilcoxon test for ranked sums yielded a z = -10.3, p < .0001). The increase was even greater (172%) compared to the previous three months of 2009. An examination of caller characteristics revealed that the increases were due almost entirely to increases among African Americans and Medicaid recipients.

Conclusion: Media campaigns, when combined with face-to-face peer outreach efforts, can prompt at-risk pregnant women to call an evidence-based quitline for smoking cessation counseling and support.
Poster Title: Lack of Routine Dental Hygiene Associated with Poor Pregnancy Outcomes

Objective: The relationship between the duration of absence of periodontal care and adverse pregnancy outcomes were studied.

Background: Recent studies suggest a link between periodontal disease, an inflammatory disease caused mainly by gram negative bacteria that destroy tooth-supporting connective tissue and bone, and preterm births. This may be due to bacteria and bacterial products triggering an inflammatory effect leading to preterm labor. Periodontal disease has also been suggested as an independent risk factor in low birth weight babies and in preeclampsia.

Method: This retrospective descriptive noted date of last dental visit for high risk deliveries. Cases were defined as delivered pregnancies that were complicated by preeclampsia, HELLP, or IUGR delivered between January 1, 2008 and December 31, 2008. Controls were term pregnancies delivered during the same time period but lacking these diagnoses. Most recent dental visit dates were compiled and broken down into intervals of < 2 years of >/= 2 years from terminal dental visit to onset of prenatal care.

Result: We identified 82 cases where complete dental data were available. 61 controls were selected at random for comparison. Cases and controls were not matched for maternal demographics. Of these 82 cases, 73% had preeclampsia, 18% had IUGR, 39% were low birth weight, and 39% had preterm births. Some cases fell into more than one category. More preeclampsia was seen in patients with dental visits >/= 2 years from onset of prenatal care (DV>2) than in patients with dental visits < 2 years (DV<2) (p=0.003). The proportions of patients with preterm births and low birth weight also had significantly more patients with DV>2 than DV<2 (p=0.009 and p=0.008 respectively). For IUGR a nonsignificant result was obtained (p=0.08).

Conclusion: DV>/= 2 is significantly associated with higher proportion of adverse pregnancy outcomes (preeclampsia, low birth weight, preterm birth). The small sample size of IUGR neonates precludes an associative relationship, but a trend is noted as well.
Poster Title: Matrix Metalloproteinase-1: A Possible Key Regulator of Premature Birth

Objective: To determine if (1) in decidual cells, neutrophil products enhance expression of MMP-1 and (2) if preterm labor decidual tissue samples would show an up-regulation of MMP-1 compared to term not in labor and term labor tissue.

Background: Two mechanisms implicated in preterm parturition are inflammation and myometrial exposure to blood. Activated neutrophils infiltrate the decidua and myometrium during labor releasing substances such as reactive oxygen species (ROS) and tumor necrosis factor alpha; (TNFalpha;), which can induce expression of other genes and demethylate DNA. Thrombin activates protease activated receptor (PAR)-1 to cause myometrial contractility in situations of placental abruption. Matrix metalloproteinase-1 (MMP-1), a product of decidual tissue, can stimulate the same pathway and could therefore be involved in labor.

Method: Decidual tissue was obtained from consented women. Primary culture decidual cells were grown on T-25 flasks with DMEM/F12 media and 10% FBS at 37°C and 5% CO2. Treatments began at 70% confluency with either (1) ROS of 0.05 mM solution hypoxanthine and 0.005 U/ml xanthine oxidase or (2) 1ng/ml TNFalpha; for 24 hrs. (3) A third treatment of 5 microM solution of 5-aza-2'-deoxycytidine (5-AZA) began at 30% confluency for 48 hrs with an additional 24 hours of clean media and 10% FBS. After treatments, cells were washed with PBS, and total RNA was extracted using the FujiFilm QuickGene Mini-80 protocol. For preterm labor, term not in labor and laboring tissue, total RNA was extracted by the same protocol. qRT-PCR was performed using MMP-1 primers from previously reported studies and fold changes were calculated with GAPDH as the housekeeping gene.

Result: All three experimental treatments increased MMP-1 gene expression. ROS induced a 7-fold increase, TNFalpha; a 16-fold increase and 5-AZA an 8-fold increase. Preterm labor showed a 34 fold increase of MMP-1 over term labor and preterm labor vs. term not in labor showed a 207-fold up-regulation of MMP-1.

Conclusion: MMP-1 expression in decidual cells can be modified by DNA methylation. Preterm decidua shows a dramatic increase in MMP-1 compared to term labor and term not in labor tissue. Additionally, TNFalpha; and ROS, two key neutrophil products, are able to increase the expression of MMP-1 to possibly initiate parturition. These data might help explain mechanisms responsible for preterm labor unrelated to infection or premature rupture of membranes.
Objective: The purpose of this particular study is to examine the link between elevated glutamate levels and human B cell activity as a novel aspect of SLE immunopathology.

Background: Systemic lupus erythematosus (SLE) is an autoimmune illness characterized by autoantibody production against self leading to widespread inflammation and tissue destruction. There is currently no cure, only treatment options to alleviate the symptoms. one of the hallmarks of SLE is an accumulation of auto-reactive B cells which are hyperproliferative and produce pathogenic immunoglobulin. Thus, treatments to target this aspect of disease are ideal. Another interesting aspect of SLE is elevated glutamate levels both in the CNS and the periphery.

Method: B cells were isolated from human tonsils in accordance to the VCU IRB. Expression of glutamate receptors was detected via reverse transcriptase PCR, Western blot, and flow cytometry. Cellular proliferation was determined via H3 thymidine incorporation assay and soluble CD23 as well as all immunoglobulin levels were detected via ELISA.

Result: We report for the first time the presence of functional ionotropic glutamate receptors on human B cell cells. Upon stimulation, B cells exhibit significantly elevated cellular proliferation and significantly elevated immunoglobulin levels. Furthermore, both of these phenomena can be reversed with specific pharmacological agents.

Conclusion: This study suggests that the elevated glutamate seen in patients with SLE may be a contributing factor to the accumulation of auto-reactive B cells as well as the production of auto-antibody. Further investigation into this aspect of B cell biology is certainly warranted and may serve as a novel means of therapeutic intervention.
Poster title: MRE11/RAD50/NBS1 Complex Functions in Invasion in Breast Cells and Tumor Progression

Objective: To investigate the involvement of the MRE11/RAD50/NBS1 or MRN complex in breast cancer progression.

Background: The MRN complex performs an essential role in conserving genetic integrity. The complex distinguishes double strand breaks, recruits ATM kinase to damage sites, and activates homologous recombinational repair of double strand breaks. Individuals with mutations in the MRE11 (Ataxia Telangiectasia-like Disorder) and NBS1 (Nijmegen Breakage Syndrome) gene are characterized with radiation sensitivity and are associated with a higher cancer rate. Using the HMT-3522 human breast cancer progression series of cell lines, we previously showed that expression levels of some genes involved in DNA double strand break repair are regulated by three-dimensional laminin-rich extracellular matrix (3D lrECM), and some of these are involved in regulating cell invasiveness. Based on these data, we set out to determine the involvement of the MRN complex in the progression to the invasive phenotype in breast cancer.

Method: Western blots or immunohistochemistry were used to determine the MRN protein expression levels. MRN proteins were downregulated using small interfering RNA (siRNA) and protein expression levels were quantified and observed using western blot analysis. Transwell invasion assay or Boyden Chamber assay was used to measure the ability of cells to invade through ECM.

Result: In non-invasive S1 cells, 3DlrECM cultures had higher levels of MRN proteins. However, in pre-invasive S3-C and invasive T4-2 cells, 3DlrECM no longer upregulated these proteins. Consequently, in 3DlrECM cultures non-invasive S1 cells had higher expression levels of MRE11, RAD50 and NBS1 compared to invasive T4-2 cells. Immunohistochemistry performed on breast tissue sections showed that, on average, normal breast tissues have higher levels of expression of MRN than in situ carcinoma and in situ carcinoma has higher levels of expression than invasive carcinoma. The functional significance of altered MRN expression was investigated by downregulation of more than 50% in MRE11, RAD50 and NBS1 in invasive T4-2 cells. This resulted in significant upregulation of the ability of the cells to invade through ECM.

Conclusion: These results support our hypothesis and suggest that the MRN complex proteins are negative regulators of breast cell invasiveness.
**Objective:** Describe how a perinatal risk assessment was developed to identify high risk pregnant women.

**Background:** Infant mortality is a major public health problem and African American women are at increased risk for poor birth outcomes. The present study describes an approach to screening and identifying high risk women.

**Method:** Research staff administered anonymous surveys to African-American women attending their first prenatal visit (N=404) in an urban hospital-based obstetric clinic. Screening tools were developed to identify social and medical risk factors that impact pregnancy outcomes. Data from the survey were used to select patients from the general clinic population who could most benefit from intervention. Cut-off scores were determined through an iterative process of examining the prevalence of each risk domain and accounting for the risk it contributes both to inadequate prenatal care and to the fetus.

**Result:** The screening tool successfully identified women with high risk medical and social conditions (37%). Many women surveyed reported depressive symptoms (42%), and approximately 15% reported they were the victim of some type of domestic violence in the past year. Furthermore, almost 1/3 reported drinking alcohol in the previous 3 months and 13% had used drugs in that time; 25% had smoked cigarettes in the past week.

**Conclusion:** The screener is a simple and efficient tool to inform decision-making in identifying women who would benefit from an evidence-based practice and provides insight into the distribution of risks in this pregnant African-American population.
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**Poster Title:** Systematic Review of Research Studies with the Sexual Relationship Power Scale

**Objective:** The purpose of this systematic review is to examine the reliability and validity of the scale across published studies as well as to integrate the results and suggest implications for practice to increase the understanding of power in relation to interrelationship problems.

**Background:** Risky sexual behaviors remain significantly high among minority women. Women’s lack of negotiation power has been identified as a key factor in unsafe sex behaviors, increasing the need for empirical evidence to understand such barriers. Pulerwitz, Gortmaker and DeJong (2000) developed the Sexual Relationship Power Scale (SRPS) in English and Spanish. The scale measures women’s relationship power and consists of a relationship power subscale (RCS) and decision-making dominance subscale (DMDS).

**Method:** A systematic search of the literature was conducted within Pubmed, CINHAL, Pschyinfo and Web of Science. Articles that integrated the SRPS were sought using a keyword search (sexual relationship power scale and sexual relationship power) and with a cited article search. The years selected for this literature search were between 2000 and 2009, since the SRPS was first published in 2000.

**Result:** Ten studies met the criteria for the review. Low SRPS score is found to be related to an increase in sexual and non-sexual violence as well as inconsistent condom use across the study populations among different geographical locations and relationship types. The RCS demonstrated good validity and reliability. However, concerns were raised about the reliability of the DMDS. More research is needed.

**Conclusion:** Analysis of study results suggests that interventions are needed to balance relationship power across genders. Both men and women must be actively involved to promote healthy sexual relationship. Thus, negative consequences of violence and unsafe sex behavior among couples would be mitigated and couples would openly build healthy relationship with safe sexual behavior. The potential use of the SPRS in clinic settings is suggested due to its easy administration and promising application to approaching women or couples in family planning counseling. From a research perspective, examining multiple levels of relationship is suggested in future studies as individuals are involved in more complex types of relationships, including primary and extra dyadic ones, as well as same-sex sexual contacts.
Poster Title: Substance use among female sex workers in St. Petersburg, Russia

Objective: This research was designed to provide preliminary data about substance use patterns in female sex workers in St. Petersburg, Russia.

Background: While no official number exists, it is estimated that there are approximately 10,000 female sex workers in St. Petersburg, Russia. Because of the increased risks associated with their profession including having a high number of sexual partners and poor access to health care due to the stigma associated with their work, this group may be especially important with regard to the exponential increase in the number of sexually transmitted diseases (STD) in St. Petersburg over the past 20 years. Further, intravenous drug use has increased during the same time period in St. Petersburg and may also contribute significantly to the STD epidemic. However, little is known about the patterns of substance use in female sex workers. An understanding of such behaviors is important to begin to understand the patterns of transmission of STDs in this population, and subsequently, in the greater St. Petersburg population.

Method: A comprehensive 265-item survey was developed and administered to female commercial sex workers in St. Petersburg. Study participants were identified with the help of social services agencies who do outreach work in the streets, brothels, and hotels in the city. The survey collected demographic, medical history, family dynamic, sexual history, substance use, and behavioral data.

Result: A total of 665 women were recruited to complete the survey. Participants were young women (median age=30-34 years, data collected categorically) who were working in the sex trade industry (69.0% as street sex workers, 30.5% as escorts, and 18.8% in massage salons). Almost all (98.5%) of these women used alcohol regularly (average 4-5 times/week) and 86.0% of these women reported a history of drug use. In women with a history of drug use, 94.4% reported current drug use with the majority of the women (93.9%) stating that their primary substance of abuse was injectable opiates.

Conclusion: The rates of substance abuse among female sex workers in St. Petersburg are alarming with an overwhelming majority of the sex workers reporting intravenous drug use. With the link between sex work, injectable drug use, and STDs, these women represent an important target in the effort to control the spread of these diseases. Study findings support the need for educational programs and interventions that target multiple risk factors including substance use. Such methods, if effective, may be critical as a means to address the epidemic spread of STDs in St. Petersburg.