Women’s Health Research Day 2013

FULL ABSTRACTS
Title: The Characterization of a Potential Lysozyme Inhibitor in Neisseria gonorrhoeae

Authors: Angelica Claxton, Department of Microbiology, Virginia Commonwealth University; Aminat Oki, Department of Microbiology, Virginia Commonwealth University; Cynthia Cornelissen, PhD, Department of Microbiology, Virginia Commonwealth University

Objectives: We have begun to characterize the iron induced outer membrane proteome of the N. gonorrhoeae strain FA1090, and have identified a previously uncharacterized iron induced lipoprotein, NGO1063. Interestingly, NGO1063 contains conserved domains found in lysozyme inhibitors of other Gram negative bacteria. Lysozyme is part of the innate immune system in all animals, and breaks down peptidoglycan layers in bacteria, making bacteria more susceptible to microbicidal environments. We hypothesize that NGO1063 is a lysozyme inhibitor, and contributes to the survival of N. gonorrhoeae.

Background: Neisseria gonorrhoeae is a Gram negative obligate human pathogen, and the etiological agent of the common sexually transmitted disease, gonorrhea. Due to the asymptomatic nature of gonococcal infection, women are especially at risk for associated morbidities such as pelvic inflammatory disease, ectopic pregnancies, and infertility. Antibiotics are regularly prescribed to persons with the infection, but recently there have been indications of a growing threat of multi-drug resistant N. gonorrhoeae worldwide. In addition, infected individuals do not develop an immune response for future protection. This suggests a need for an alternative approach in combating this pathogen. Previous research has indicated enhancement of invasion by N. gonorrhoeae into cervical epithelial cells in the presence of excess iron. Iron induced N. gonorrhoeae invasion is a potential target for therapy, but research on the relationship of iron dependency and pathogenicity is limited.

Methods: We have employed the use of transposon mutagenesis as well as E. coli and Neisseria gonorrhoeae transformations.

Results: We have created a NGO1063 knockout via transposon mutagenesis, and we are currently performing assays to determine if this lipoprotein indeed confers protection against lysozyme in wildtype compared to the mutant.

Conclusion: So far, there seems to be an indication of differences in growth curves of the mutant compared to be wildtype. This research, however, is ongoing and our work will be the foundation for defining the role of NGO1063 in gonococcal virulence.
Title: Characterization of the pathogenesis of intrauterine and intra-amniotic infection by Mycoplasma hominis

Authors: Matthew, Allen-Daniels, Microbiology & Immunology, VCU; Michael, Harwich, Microbiology & Immunology, VCU; Vaginal Microbiome Consortium (additional members); Gregory, Buck, Microbiology & Immunology, VCU; Kimberly, Jefferson, Microbiology & Immunology, VCU

Objectives: Our long-term goal is to characterize Mycoplasma virulence factors involved in intrauterine and intra-amniotic infection. We hypothesize that Mycoplasma expresses surface-associated adhesins and invasins to invade the amniotic sac.

Background: Preterm birth is the leading cause of morbidity and mortality in neonates and is defined as birth before 37 weeks gestation. A significant number of preterm births can be etiologically linked to bacterial infection of the chorion, amnion, and/or amniotic fluid. One of the most common bacterial isolates is Mycoplasma. Infection can prompt maternal and fetal pro-inflammatory immune responses, which can subsequently trigger preterm premature rupture of membranes (PPROM), preterm labor, or both. While very little is known about the pathogenesis of amnionitis caused by Mycoplasma, evidence suggests that the typical route of infection is ascension from the vagina, which would generally require traversal of the cervical mucus plug and invasion of the chorion, amnion, or amniotic fluid.

Methods: We obtained two amniotic fluid cultures and one placental culture from women who gave birth preterm. We also obtained a vaginal swab specimen from a woman who gave birth full term as a control. We began by confirming the identity of the bacterial species in the cultures by PCR using universal 16S rRNA primers, and subsequently used the tumorigenic cell line JEG-3 as a model for placental epithelial cells to analyze adherence and invasion of Mycoplasma.

Results: The amniotic fluid and vaginal isolates were identified as M. hominis. We isolated total genomic DNA from the M. hominis strains and the whole genome was sequenced with the ultimate goal of identifying factors involved in adherence and invasion. Preliminary data indicates both adhesion and invasion of Jeg-3 cells by M. hominis.

Conclusion: Knowledge of virulence factors involved in the pathogenesis of M. hominis may ultimately contribute to improved detection and/or treatment of women who have a high risk of pre-term birth.
ID: 3

Submitting Author: M. Imad, Damaj, Professor, Pharmacology & Toxicology, Medicine, mdamaj@vcu.edu, 804-828-1676

Title: Sex differences influencing the role of α7 nicotinic acetylcholine receptor in Murine Dextran Sodium Sulfate-Induced Colitis Model

Background: Substantial evidence in the literature showed that tobacco smoking ameliorates ulcerative colitis and affects on the disease course and severity. Nicotine seems to be a key mediator of this response as has been demonstrated by the use of transdermal patches and nicotine enemas, where their use inhibits inflammation associated with UC. Data from animal studies suggested that α7 nicotinic acetylcholine receptor (nAChR) subtypes might mediate the anti-inflammatory effects of nicotine.

Objectives: This study was designed to provide more insight on the role of α7 nAChR in colitis in the animal. We evaluated the effect of selective α7 nAChR agonists (PHA-543613 and choline) and positive allosteric modulator (PAM) (PNU-120596) on the severity of the disease in the DSS-induced colitis model in the mouse.

Methods: C57BL6 male and female adult mice were given 2.5% DSS solution freely in the drinking water for 7 consecutive days after which tap water was given on the 8th day. Control animals received normal drinking water. We evaluated a Disease Activity Index (DAI) daily after induction of colitis that includes percentage of body weight change, blood presence in stools, stool consistency, rectal irritation and measure the colon length. The mice were then sacrificed on day 8 to allow examination of the entire colon. Disease severity, colon tissue histology and inflammation were evaluated. Using this model, we induced colitis in α7 nicotinic receptor knockout (KO) mice, their littermates wild-type (WT) mice and assessed their DAI, colon tissue histology damage, and colonic tumor necrosis factor-α (TNF-α) levels.

Results: Male but not female α7 KO mice displayed a significantly increased in DAI value starting from day 4 till day 8, histological damage scores and TNF-α levels of were increased significantly compared to their littermate WT mice. The anti-colitis effects of these α7 compounds dissipated at higher doses. Moreover, pretreatment with PHA-543613, choline and PNU-120596 significantly reduced clinical parameters of inflammation in DSS-treated male mice. However, the α7 agonist choline failed to significantly reduce inflammatory signs in the female DSS-treated mice. Interestingly, the effects of choline in the DSS model was reestablished in ovariectomized (OVX) mice compared to sham operated mice.

Conclusion: These results suggest that in male mice, α7 nAChRs subtype have a protective role in colitis with a narrow therapeutic index. In females, α7 nAChR subtypes-mediated anti-inflammatory effect in colitis is absent in females with intact ovaries, but may be present in females without ovarian function. Ovarian hormones may play a key role in the sex differences seen in effects of α7 nAChRs modulation of colitis in the mouse.
ID: 4

**Submitting Author:** Aileen, Garcia-Vargas, Mechanisms of Anoikis Resistance in Breast Cancer Cell Lines, Biochemistry &Molecular Biology, Medicine, garciavargam@vcu.edu, 787-421-5752

**Title:** Mechanisms of Anoikis Resistance in Breast Cancer Cell Lines

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**Objectives:** In the present study, we aim to characterize the association of Nck1 and eIF2-α; in the process of anoikis resistance, a hallmark of metastatic breast cancer is resistance to a form cell death induced by anchorage-dependent cells detaching from the extracellular matrix.

**Background:** Breast cancer is the second most common cause of death due to cancer among women and leads to approximately 8,000 to 10,000 deaths per year in the United States. Mortality in breast cancer arises mainly from metastasis, and a hallmark of metastatic tumor cells is the ability to escape from anoikis and invade other organs. Lapatinib is a chemotherapeutic agent recently approved for the treatment of metastatic breast cancer, but outcomes are still not optimal. In this regard, our laboratory recently explored the combination of lapatinib with the chemotherapeutic, OSU-03012, in vitro. This combination therapy killed breast cancer cells in a synergistic fashion with the greatest effect observed on triple negative breast cancer cell line.

Mechanistic studies demonstrated that phosphorylation of eIF2-α; on serine-51 was a required step in the synergistic killing induced by the lapatinib/OSU-03012 combination. Further studies demonstrated that the downregulation of Nck1 is upstream of the phosphorylation of eIF2-α; in cell death induced by these drugs.

**Methods:** The Nck1/eIF2 complex was evaluated by a combination of molecular approaches to modulate Nck1 and eIF2-α; expression/phosphorylation in breast cancer cells. Cells were then assayed for apoptosis, anoikis resistance, motility and invasiveness in vitro after modulating Nck1 expression and eIF2-α; phosphorylation.

**Results:** Anoikis resistant breast cancer cell lines demonstrated suppression of ER stress pathways characterized by dysregulated Nck1 expression and eIF2-α; phosphorylation. Our data suggest that the Nck regulated phosphorylation of eIF2-α; impacts breast cancer metastasis.

**Conclusion:** In conclusion, these studies suggest that disruption of Nck1/eIF2 complex reduces aggressiveness of breast cancer cells in pre-clinical models.
Submitter: Yun-Kyung, Hahn, Post-doc, Anatomy & Neurobiology, Medicine, hahnyk@vcu.edu, 859-227-8755

Title: Sex influences the effects of long-term HIV-1 Tat exposure: Changes in inflammation and cell population affect behavior

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Objectives: We utilized a mouse model in which HIV-1 Tat1-86 is conditionally expressed in astroglia. Tat expression was induced in female and male mice by 12 weeks of doxycycline administration by chow.

Background: Combination anti-retroviral therapy (cART) has caused a dramatic decline in human immunodeficiency virus (HIV)-associated mortality. However, the overall prevalence of more moderate motor and cognitive deficits, collectively termed HIV-associated neurocognitive disorder (HAND), has remained the same in cART treated patients. Sex-difference in CNS vulnerability to HAND has been controversial. However, HIV-infected women are more likely to live in poverty, to have lower literacy levels, higher injection drug abuse rates, and poorer mental health worldwide. These considerations might significantly influence either CNS vulnerability to HIV, or a diagnosis of neurocognitive disability. Therefore, additional and controlled studies are required to address the possibility that sex can influence susceptibility to HAND.

Methods: Behavioral tests (rotarod, grip strength, open-field, light-dark box) were applied to Tat- and Tat+ mice at 6 month age. The brain sections including striata from these mice were examined by stereological, immunohistochemical, and molecular biological (pre-/post- synaptic proteins) approaches.

Results: Males showed more Tat-induced impairment in behavioral tests (rotarod, grip strength, light-dark box). Chronic Tat induction did not alter striatal volume or total striatal cell number in either males or females, but did significantly alter cell populations in both sexes. Males had greater increases in astroglia and activated microglia than females, and also had slightly increased TUNEL+ striatal neurons. Tat+ male mice also showed significant alterations in the levels of both inhibitory (gephyrin, synaptotagmin 2) and excitatory (PSD95, synapsin) pre- and post-synaptic proteins, while only synapsin was altered in female mice.

Conclusion: Chronic Tat exposure appears to alter the normal cell balance in the CNS in favor of inflammatory cells. These changes are more pronounced in males, as are changes in levels of synaptic proteins. We cautiously speculate that enhanced inflammation in the microenvironment of the male vs. female CNS may result in greater synaptic reorganization and more behavioral impairment.
**ID: 6**

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**Title:** FTY720, a Sphingosine-1-phosphate Receptor Type 1 (S1PR1) Modulator, Suppresses Obesity-related Breast Cancer Progression in Two Animal Models

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**Objectives:** Our hypothesis is that obesity and its related inflammation up-regulate SphK1, which produces more S1P; the elevated levels of S1P in both tumor and its microenvironment stimulate breast cancer progression. FTY720 is expected to disrupt the SphK1/S1P/S1PR1 axis, which is strengthened by obesity, and to reduce cancer metastasis and prolong survival.

**Background:** Breast cancer is the most commonly diagnosed cancer among women, and close to 40,000 breast cancer deaths are expected to occur among US women in 2011. Obesity, which is the number one health risk in US ranked by the CDC, is an established independent prognostic factor for breast cancer patients. While the link between obesity and elevated breast cancer mortality is well known, the underlying mechanisms are poorly understood. The pleiotropic bioactive lipid mediator sphingosine-1-phosphate (S1P) has emerged as a key regulatory molecule in cancer progression and inflammation. S1P is generated by two sphingosine kinases, SphK1 and SphK2, and exerts its functions by binding to specific G protein-coupled receptors (S1PR1-5). FTY720, which after phosphorylation is a S1PR1 functional antagonist, was recently approved by FDA for multiple sclerosis. It also has been suggested to have some anti-cancer actions.

**Methods:** We utilized two different syngeneic breast cancer mouse models: 4T1-luc2 cells in BALB/c mice and E0771 cells in C57Bl/6J mice, both inoculated into mammary fat pads of mice fed with normal or high fat diet. FTY720 was given orally. Western blot, QPCR and LC-ESI-MS/MS assays were used.

**Results:** We observed that breast tumors in obese animals expressed higher levels of SphK1 and S1P transporters, such as ABCC1 and Spns2, as compared to animals on a normal diet. The levels of S1P in the plasma of obese mice were also elevated, which appears to be a consequence of the higher production of S1P by SphK1 in the tumor and its microenvironment. Moreover, tumor progression in both models was suppressed by administration of FTY720. Interestingly, cancer progression was suppressed more efficiently in the obese mice than the lean mice.
**Conclusion:** These results suggest that the S1P axis is strengthened by obesity-related inflammation, and that FTY720 may be useful for treating breast cancer in individuals with obesity.

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ID: 7

Submitting Author: William, Nugent, Dr., Obstetrics & Gynecology, Medicine, nugentwh@vcu.edu, 804-828-119

Title: Epigenetic Regulation of Interleukin-17 Cytokines and Their Role in Neutrophil Infiltration in Preeclampsia

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Objectives: To determine whether IL-17 cytokines have reduced methylation in preeclampsia and whether this affects their expression.

Background: IL-17 producing T-cells are elevated in women with preeclampsia. IL-17 cytokines are potent inflammatory agents and implicated in hypertension. DNA methylation is a major epigenetic mechanism controlling gene expression and reduced methylation is associated with increased gene expression.

Methods: We used the Illumina platform to conduct a global assessment of DNA methylation in omental arteries and leukocytes of normal pregnant and preeclamptic (PE) women.

Results: We found significantly reduced methylation for IL-17A, IL-17D, IL-17E, IL-17F in PE. Significantly reduced methylation was also present for IL-2, which regulates T-cells, for Th2 cytokines, IL-4, IL-5, IL-10, and for TNF. To test if methylation regulates IL-17 cytokines, a lymphocyte cell line (Jurkat), was cultured with 5-Aza (5 μM), a hypomethylation agent, for 48 h (n=8). Specific primers and qRT-PCR were used to assess gene expression. Compared to control, 5-Aza significantly increased IL-17D, 8±3-fold, IL-17E, 18±6-fold and IL-17F, 19±6-fold (P<0.001). IL-17A was not expressed by Jurkat cells. 5-Aza also increased IL-2, 82±26-fold and TNF, 34±3-fold (P<0.001). To test if IL-17 cytokines could be responsible for infiltration of neutrophils, human vascular smooth muscle cells were cultured with IL-17 and neutrophil chemokines were measured. IL-17 significantly increased IL-8, 2.4±0.3-fold, CXCL5, 2.1±0.4-fold, CXCL6, 2.4±0.5-fold (P<0.01).

Conclusions: IL-17 cytokines are regulated by DNA methylation and stimulate expression of neutrophil chemokines in vascular smooth muscle. Speculation: Reduced DNA methylation in PE causes T-cell release of IL-17 cytokines that stimulate vascular smooth muscle expression of chemokines. Neutrophils then infiltrate and their release of ROS enhances vascular reactivity leading to hypertension. NIH P60MD002256, HL069851
**ID: 8**

**Submitting Author:** William, Nugent, Dr., Obstetrics & Gynecology, Medicine, nuggesth@vcu.edu, 804-828-119

**Title:** Neutrophil Elastase in Term and Preterm Labor: A Novel and Potent Uterotonic Enzyme that acts via PAR 1

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**Objectives:** To determine whether elastase is increased and correlated with neutrophil infiltration in decidua of women with term and preterm labor and is capable of activating PAR-1 and inducing uterine contractions.

**Background:** Labor is associated with neutrophil infiltration into decidua and myometrium. Neutrophils release elastase, which is a serine protease and thus capable of activating protease-activated receptor 1 (PAR1 or thrombin receptor).

**Methods:** Decidual tissue was collected from fetal membranes of term not in labor (TNL, n=7), term labor (TL, n=7) and preterm labor (PTL, n=6) patients and analyzed by immunohistochemistry for neutrophil elastase and Western blot for decidual elastase expression. Contractile effects of elastase were tested with uterine strips of Day 19 gestation rats.

**Results:** Neutrophils expressing elastase were increased in TL decidua as compared to TNL, but markedly increased with PTL (P<0.05). Western blot confirmed increased expression of elastase in TL and PTL decidua. Elastase (0.33-0.66 U/ml) caused significant increases in contraction of uterine strips. Average area of contraction increased from baseline of 3.5±1.6 to 20.8±4.6 gm tension/min with only 0.33 U/ml (n=12, P<0.01) and was further increased with 0.66 U/ml. PAR1 antagonist (10-50 µM) inhibited contractions induced by elastase (P<0.01).

**Conclusion:** Elastase and neutrophils expressing elastase are increased in TL and PTL decidua. Elastase is a novel and potent uterotonic agent that causes uterine contraction via PAR1. We speculate that neutrophil infiltration with release of elastase plays an important role in term and preterm labor. NIH P60MD002256, HL069851
ID: 9

**Submitting Author:** Omar, Rashid, General Surgery Resident, Biochemistry & Molecular Biology, Medicine, orashd@mcvh-vcu.edu, 954-319-6007

**Title:** Development of an orthotopic cancer cell implantation method to generate a murine metastatic breast cancer model for translational research and drug development

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**Objectives:** Our hypothesis is that orthotopic implantation of 4T1-luc2 cells produces tumors with different genetic profiles than the same cells implanted subcutaneously, including significant differences in the expression of genetic targets of cancer research and drug development. Because of the importance of accurately implanting cells into the target tissue and minimizing confounding factors, orthotopic under direct vision (OID), subcutaneously (Sq) and percutaneously (OP) were compared. Cancer progression, mortality, and tumor gene signatures of OID and Sq were also compared. Finally, the differences in the expression of gene targets of cancer research and drug development of OID and Sq tumors were compared and validated.

**Background:** Mouse breast cancer models are routinely used for drug development. Despite a cost of 37 months in animal trials and $610 million to develop one drug, there has been no critical evaluation of these models. We hypothesized that orthotopically implanted 4T1-luc2 cells produces tumors with significantly different gene expression profiles compared to subcutaneous implantation.

**Methods:** Murine mammary adenocarcinoma, 4T1-luc2 cells, were implanted subcutaneously (Sq) or orthotopically by percutaneous injection in the area of the nipple (OP) or surgically under direct vision (OID) in Balb/c mice. Tumor burden was quantified by bioluminescence. Tumors were harvested 10 days later, and genome-wide microarray, pathological, and survival analysis were performed.

**Results:** A literature review demonstrated no consensus breast cancer model. OID produced a more stable and reliable method of implantation than Sq or OP. Ten uL OID modeled breast cancer progression by metastasizing to the regional lymph nodes and then distant organs, correlated with bioluminescent tumor burden quantification and survival analysis. OID and Sq produced tumors which differentially expressed genes by genome-wide microarray analysis whose interaction networks demonstrated eight significant gene interaction networks (p<0.0001;1x10-30) with top functions of importance in cancer research and development. qPCR validation of 10 specific targets of interest in the development of targeted therapy (wnt5a, pdgfa, twist2, s100a16, cxcl14, epha3, hsp110, cd59a, hdac1, and notch4) demonstrated significant differences in expression (p<0.0001).

**Conclusion:** OID modeled breast cancer better than other methods, and produced tumors with significantly different genome expression profiles than Sq, of importance for cancer research and development.
ID: 10

**Submitting Author:** Mychal, Anderson Thomas, Dr., Obstetrics & Gynecology, Medicine, ml.andersonthomas@gm, 804-690-9546

**Title:** The Influence of Centering Pregnancy on Postpartum Outcomes

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**Objectives:** To examine the effect of Centering Pregnancy prenatal care on postpartum outcomes.

**Background:** The Centering Pregnancy prenatal care model has shown promise in reducing poor birth outcomes. However, its influence on postpartum outcomes has not been well investigated.

**Methods:** Medical records from pregnant women who received Centering Pregnancy prenatal care (N=107) and the usual care (N=97) between 2009 and 2012 were reviewed. Information on postpartum outcomes including postpartum visit attendance, birth control use, weight gain during pregnancy, and breastfeeding initiation were collected. Additionally, demographic characteristics, reproductive history and life style behaviors were abstracted. Data was analyzed using a logistic regression and odds ratio and 95% confidence intervals were calculated.

**Results:** There was no statistically significant difference between the Centering and the usual care groups with regard to demographics. Women who received Centering Pregnancy prenatal care were more likely to attend postpartum visit, receive birth control and initiate breastfeeding compared to women who received the usual prenatal care model.

**Conclusion:** Centering Pregnancy may offer improved postpartum outcomes. Further analysis using a larger sample size should be conducted to confirm this result. The current analysis does demonstrate that Centering Pregnancy significantly improves the rate of breastfeeding initiation and contraception use.
ID: 11

**Submitting Author:** Susan, Cha, Epidemiology & Community Health, Medicine, chas@vcu.edu, 703-623-8111

**Title:** Increasing contraceptive use after birth: The power of prenatal education and counseling

**Authors:** Susan Cha, BA, MPH, Division of Epidemiology, Department of Family Medicine and Population Health, Virginia Commonwealth University; Saba W. Masho, MD, MPH, DrPH, Division of Epidemiology, Department of Family Medicine and Population Health, Virginia Commonwealth University

**Objectives:** Therefore, this study aims to determine the prevalence of prenatal contraceptive counseling in the U.S. and assess the extent to which prenatal contraceptive counseling is associated with increased postpartum contraceptive use.

**Background:** Unintended pregnancy affects nearly half of all births in the U.S. and is associated with adverse pregnancy-related outcomes such as perinatal mortality, postpartum complications and low birth weight. Effective contraceptive use is critical in perinatal outcomes while prenatal counseling provide women the opportunity to discuss their options and make timely decisions about family planning.

**Methods:** This cross-sectional study analyzed data from the National Pregnancy Risk Assessment Monitoring System (PRAMS). Study participants included all women living in the U.S. who delivered a live birth infant from 2004 to 2008 (n=198,055). Effect modification was not significant for race/ethnicity, education, adequacy of prenatal care, and insurance status (p>0.05). Multiple logistic regression models provided crude and adjusted odds ratio and 95% confidence intervals.

**Results:** Approximately 20% of participants reported not receiving education on birth control methods during any of their PNC visits from health providers. Among women with prenatal contraceptive counseling, 86% reported using a contraceptive method following birth. Women who had discussions about birth control methods had 1.7 times the odds of reporting postpartum contraceptive use than women with no prenatal contraceptive counseling (COR = 1.7, 95% CI = 1.6-1.8). Estimates adjusted for confounding yielded similar results (AOR = 1.5, 95 % CI = 1.4 - 1.6).

**Conclusion:** Findings have important clinical implications for the role of patient-provider discussions in improving postpartum health behaviors. Health care providers are strongly urged to use prenatal visits as opportunities to tailor contraceptive plans and cover other health topics that promote wellness after delivery and into subsequent pregnancies.
ID: 12

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**Title:** Trichomonas vaginalis genotypes, the vaginal microbiome, and women’s health

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**Objectives:** To genotype the T. vaginalis strains present in the vaginal microbiomes of women with trichomoniasis and observe associations with the vaginal microbiome, specific bacterial species, participant demographics and other relevant clinical information.

**Background:** Trichomoniasis, the most common non-viral sexually-transmitted disease world-wide, affects approximately 3.7 million people in the United States. Largely neglected in comparison to other sexually transmitted infections, its genetic diversity remains poorly understood. Genotyping of the causative agent Trichomonas vaginalis accompanied by taxonomic profiling of the polymicrobial communities in the vagina permits association of T. vaginalis biotypes with bacterial communities, novel bacterial species and diverse pathological and physiological conditions.

**Methods:** More than 5,000 participants were sampled in the Vaginal Human Microbiome Project at VCU. Vaginal microbiome profiles of 63 participants with a current diagnosis of trichomoniasis were generated by targeting the V1-V3 region of the 16S ribosomal RNA gene for sequencing using the Roche 454 Titanium GS FLX technology. Species-level classification was achieved using our STIRRUPS classifier and Vaginal 16S rDNA Reference Database. T. vaginalis strains were genotyped by PCR amplification and analysis of the CRN, Mlh1a and PMS1-like genes.

**Results:** Three T. vaginalis genes from the vaginal samples of 43 participants with a diagnosis of trichomoniasis were amplified and genotyped by alignment, clustering and comparison to typed strains. We found that Type 2 T. vaginalis was more abundant in our local population and was prevalent in a limited number of samples from Caucasian and Hispanic individuals. Type 1 T.vaginalis was associated with more advanced age. Our data also suggest that a previously unreported bacterial species is more highly associated with trichomoniasis than the association previously reported for Mycoplasma hominis.

**Conclusion:** Genotyping of T.vaginalis strains provides a greater understanding of their relevance to intra-species diversity and vaginal health. Representative profiles of the vaginal microbiome, coupled with the ability to rapidly sequence and characterize relevant species and the availability of comprehensive demographic and clinical information, leads to a better understanding of the association of genotypic variation of the parasite with the microbial environment and resulting dysbiosis.
Yoga as an adjunctive therapy for women with treatment-resistant major depressive disorder: Findings from a randomized controlled mixed-methods study

The goal of this prospective mixed-methods pilot study was to evaluate the feasibility, acceptability, and effects of an 8-week community-based gentle hatha yoga intervention for women with MDD with persistent depressive symptoms despite treatment with the usual care (e.g. antidepressants and/or psychotherapy).

Major depressive disorder (MDD) affects millions of individuals and causes significant suffering worldwide. Women have higher lifetime incidence rates of MDD than men and are likely to explore complementary therapies because the usual allopathic care may inadequately decrease their symptoms, may be too expensive, or may have unappealing side effects. As such, there is an urgent need for high quality research about the effects of complementary interventions, such as yoga, in women with treatment-resistant depression. Yoga appears to have clinical relevance as an adjunctive therapy for individuals with depressive symptoms.

Women with MDD and with residual depression symptoms despite usual care treatment were recruited from the community. The 27 participants were randomized to receive either 8 weeks of group yoga classes plus home-based practice or 8 weeks of group health-education (HE) classes plus home-based readings. All participants continued their usual care for depression during the study. The primary measures were depression, ruminations, anxiety, stress, and interpersonal factors. Follow-up qualitative interviews were conducted at the completion of the 8 week classes.

Twenty seven women (mean age 43±15.6) participated in the study, with higher retention rates in the yoga group (80%, n=12) than in the HE group (50%, n=6). Multilevel models revealed that participants in both groups had a significant decrease in depression scores (p<.05), such that the mean depression score decreased from a “moderately severe” level to a “minimal” level of depression, per PHQ9 criteria, in 8 weeks. The yoga group had a unique trend (p=.08) towards decreased ruminations over time. Qualitative data support the feasibility and acceptability of yoga for this clinical population.

This data suggest that yoga may be a feasible and effective adjunctive treatment for decreasing depressive symptoms in individuals with MDD. Despite the small sample size, there was a unique trend towards decreased ruminations in the yoga group. Further research is warranted to evaluate if, given enough time and with a larger sample size, the effect of the decreased ruminations would cause a more significant decrease in depression in the yoga group.

The unique role of yoga in decreasing ruminations warrants particular attention as a potential mechanism for reducing depression. Considering the speculation that MDD is associated with accelerated aging-related biological and functional decline, future research will build upon these findings to include additional biobehavioral outcomes such as inflammatory markers and telomere length.
ID: 14

Submitting Author: Susan, Lindner, RNC-OB, MSN, Other, Nursing, lindnersl@vcu.edu, 804-898-5251

Title: Doula’s as an Alternative to Support High- Risk Mothers during Pregnancy

Authors: Susan L. Lindner, RNC-OB, MSN, Virginia Commonwealth University, School of Nursing, Family and Community Health Department; Amanda Aragona Nursing Student (NS), Grace Callow, NS, Kara Heird, NS, Emily Hicks, NS, Brianne Jarling, NS, Meghan Kneale, NS, Rachel Lape, NS, Rachel Powell, NS, Amy Steinbuechler, NS, Brittany Stroud, NS; Virginia Commonwealth University, Nursing Students, School of Nursing

Background: The word doula means labor coach and doulas are increasingly becoming customary in today’s culture of pregnancy and birth. At Virginia Commonwealth University School of Nursing (SON), nursing students in a senior level Community Health clinical are being educated as doulas through a rigorous training, and volunteering their doula services to any mother who might desire to have a doula during the pregnancy, labor and delivery, & birth. The clinical faculty and nursing students learned through service learning projects and attending Centering in Pregnancy the increase necessity for doula’s among high-risk mothers.

Objectives: Objectives are to increase the population of doulas in the School of Nursing to provide a doula for every mother who is pregnant and cannot afford the doula services. Historically, clients such adolescence, diabetes, hypertension, depression, pre term labor, and smoking are considered high risk and through our service learning project numerous mothers cannot afford the services. Often these mothers’ have increased questions, concerns, and a lack of support from family and friends.

Results: Raw data collected and the nursing students have cared for approximately sixty mothers and families. In addition, the data demonstrated caring for high-risk mother’s, predominately adolescence mothers. The Certified Nurse Midwives (CNM) at Virginia Commonwealth University Health Systems invited the nursing students to the Centering in Pregnancy Group to discuss the Volunteer Doula Program. At one meeting six mother’s stated interest and have been contacted by the doula’s to provide the service. Currently, groups of nursing students, as well as the Birth Companion clinical are volunteering in the community to provide the doula service.

Conclusion: The call for volunteer doula support is increasing and the need for their support is developing relationships between the client and doula that is life long. The nursing students have joined forces to give of their time through the doula training, care for clients, support families, and attend births to families in Richmond, VA. The nursing students in the Virginia Commonwealth University School of Nursing Doulas (VCU SOND) are meeting monthly, created a Face Book page, and continue to work with women and their families in the community.
ID: 15

**Submitting Author:** Victoria, Menzies, PhD, RN, Other, Nursing, vsmenzies@vcu.edu, 804-628-3381

**Title:** Unique Cytokine Signature in the Serum of Women with Fibromyalgia

**Authors:** Victoria, Menzies, PhD, RN, Nursing; Elizabeth McGee, MD, Virginia Commonwealth University, College of Medicine, Department of Obstetrics and Gynecology, Institute for Women's Health; Jamie Sturgill, PhD, College of Medicine, Department of Microbiology and Immunology, Institute for Women’s Health.

**Objectives:** The objective of this study was to examine serum cytokine levels of women who participated in a cross-sectional, observational study conducted to characterize the relationships among perceived stress, pain, fatigue, depression, sleep quality, biomarkers, and functional status in women with FMS.

**Background:** Fibromyalgia (FMS) is a chronic pain syndrome with a complex but poorly understood pathogenesis affecting approximately 10 million adults in the United States. It is estimated that 90% of diagnoses are reported in women. The lack of a clear etiology of FMS has limited the effective diagnosis and treatment of this debilitating condition.

**Methods:** The protocol was approved by the Institutional Review Board (IRB) of Virginia Commonwealth University. Study participants were administered a set of questionnaires, followed by venipuncture and collection of a 3 cc blood sample for biomarker analysis. Blood samples were collected into heparinized Vacutainer tubes. All samples were analyzed for cytokine levels using the 17-plex Human Bio-Rad cytokine, chemokine, and growth factor assay kit (Bio-Rad; Hercules, CA).

**Results:** Post hoc analysis of serum cytokine levels was performed to determine if patterns appeared that were not specified a priori. Upon examination of the 17 cytokines/chemokines detected, patients with FMS exhibited increases in key patterns of cytokines that are consistent with a T helper cell type one signature. This TH1 skewed cytokine pattern was characterized by an elevated average serum IFN-gamma of 31.1 pg/mL (normal range 2-5 pg/mL) and decreased average serum IL-4. Furthermore there was a clear elevation in hematopoietic cytokines such as IL-7 (FMS 9.27 pg/mL, normal less than 1pg/mL) and GM-CSF (FMS 25.90 pg/mL, normal 2.5pg/mL).

**Conclusion:** The finding of a well-known inflammatory pattern of cytokine elevations not only supports the role of inflammation in FMS but may lead to more definitive diagnostic tools for clinicians treating FMS. The elevation of the hematopoietic cytokines provide strong evidence of immune dysregulation in patients with FMS.
ID: 16

Submitting Author: Akimitsu, Yamada, Postdoctoral fellow, Surgery, Medicine, ayamada@vcu.edu, 804-828-9333

Title: Human breast cancers that co-express sphingosine kinase 1 and ABCC1 have significant shorter disease free survival

Authors: Akimitsu Yamada, Department Surgery and Department of Biochemistry and Molecular Biology, and Massey Cancer Center, VCU; Masayuki Nagahashi, Department Surgery and Department of Biochemistry and Molecular Biology, and Massey Cancer Center, VCU; Tomoyoshi Aoyagi, Department Surgery and Department of Biochemistry and Molecular Biology, and Massey Cancer Center, VCU; Sheldon Milstien, Department of Biochemistry and Molecular Biology, VCU; Sarah Spiegel, Department of Biochemistry and Molecular Biology; Takashi Ishikawa, Department of Breast and Thyroid Surgery, Yokohama City University Medical Center; Itaru Endo, Department of Clinical Oncology and Breast Surgery, Yokohama City University; Kazuaki Takabe, Department Surgery and Department of Biochemistry and Molecular Biology, and Massey Cancer Center, VCU

Objectives: We hypothesized that activated SphK1 and expressions of ABC transporters in breast tumors are associated with prognosis.

Background: The pleiotropic bioactive lipid mediator sphingosine-1-phosphate (S1P) has emerged as a key regulatory molecule in breast cancer progression. We have previously demonstrated that S1P generated by sphingosine kinase 1 (SphK1) in breast cancer cells is exported out of the cells via ATP-binding cassette (ABC) transporters, ABCC1 and ABCG2. ABC transporters are known as multidrug resistance proteins that efflux various compounds out of cells including chemotherapeutic agents.

Methods: We constructed a tissue microarray with 281 breast tumors from patients, and analyzed expressions of representative transporters (ABCB1, ABCC1, and ABCG2) and activated SphK1 (pSphK1), S1P receptor1 (S1PR1) immunohistochemically. Breast cancer subtypes were determined by immunohistochemistry of estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2 (HER2). Protein expression was correlated to clinicopathological characteristics, clinical follow-up, and pathological complete response to neoadjuvant chemotherapy.

Results: The tissue microarray was comprised of 191 luminal A (68.0 %), 17 luminal B (6.0 %), 27 HER2 (9.6 %), and 46 triple-negative (16.4 %) samples. Activated SphK1 was highly expressed in the patients with lymph node metastasis (40.1% vs 27.3%, P=0.037) and the pSphK1 high expression group had significantly shorter disease free survival (DFS) (P = 0.05). Eighty percentage of the patients expressed S1PR1; however there was no significant difference in prognosis. On the other hand, ABCC1 expression was associated with significantly shorter DFS (P = 0.027 and P = 0.003, respectively). ABCC1 and ABCG2, but not ABCB1, were expressed significantly higher, and more frequently, in aggressive subtypes. Patients expressing both pSphK1 and ABCC1 had significantly shorter DFS (P = 0.002), while patients expressing both ABCB1 and pSphK1 did not.

Conclusion: We have shown that ABCC1 and ABCG2 are highly expressed in aggressive breast cancer subtypes, and that tumor pSphK1 and ABCC1 expression are associated with poor prognosis. Our result indicates that S1P transported via ABCC1 may play a significant role in human breast cancer progression.
ID: 17

Submitting Author: Mary, Alemayehu, Social &Behavioral Health, Other, alemayehum@vcu.edu, 571-345-4804

Title: Will Adequate Prenatal Care In Addition to Case Management Services Decrease Pre-term Birth and Low Birth Weight Among Underserved Pregnant Women?

Authors: Mary, Alemayehu, Social &Behavioral Health; Saba Masho MD, Department of Family Medicine and Population Health, Division of Epidemiology

Objectives: The objective of this study is to examine the influence of timing and frequency of home visiting case management services and adequacy of prenatal care on pre-term birth and low-birth-weight (LBW) among underserved pregnant women served under CHIP of Richmond.

Background: Infant mortality is a major problem in the United States. Preterm birth and low birth weight are two of the leading causes of infant mortality rate among African Americans. Home visiting programs providing case management services have shown promise in improving maternal and child health outcomes. However, the influence of home visiting programs and adequacy of prenatal care on poor birth outcomes has not been evaluated.

Methods: Electronic clients encounter data from June 1, 2002 to June 1, 2012 were analyzed to assess the effectiveness of the Healthy Start Initiative in Richmond, VA. The data consisted of 299 women who received case management services. Timing of case management initiation and frequency of case management were assessed. Univariate and multivariate analysis were conducted to examine the association. Confounding factors such as age, ethnicity, marital status, income, education, reproductive history and pregnancy complications were assessed.

Results: Nearly half of the women (45.5%) entered case management services during the third trimester. Approximately 44.1 % of the pregnant women began case management services during the second trimester and only about 10.4 % began care during the first trimester. African Americans with low educational status were more likely to begin receiving case management services late in the pregnancy (second and third trimester). Late entry to receiving case management and low frequency of case management services were significantly associated with increased preterm births and low birth weight after controlling for risk status demographic and reproductive factors.

Conclusion: Receipt of case management of services early in pregnancy is an important factor in reducing poor birth outcomes. Public health programs should make the effort to enroll high risk women earlier in their pregnancies.
ID: 18

Submitting Author: Candace, Burton, Assistant Professor, Other, Nursing, cwburton@vcu.edu, 804-828-3681

Title: Project Connect: Training and Outcomes in a Sample of Family Planning and Public Health Care Providers

Authors: Candace Burton, PhD, RN, FNE; Kellie Carlyle, PhD, MPH; Anya Shaffer, MPA; Laurie Crawford; Elizabeth Miller, MD, PhD

Objectives: This qualitative evaluation research project explores outcomes of Project Connect training among Virginia clinic-based and home care providers screening for violence and abuse, intervention, and policy development. Goals are to evaluate implementation of the training initiative from the perspective of trained providers and staff; and examine perceived quality, satisfaction, and success with Project Connect screening and intervention strategies among staff and providers.

Background: Over $4 billion in physical and mental health service costs result annually from intimate partner violence (IPV) in the US. Many victims of IPV are predominantly women, thus visit health care providers, yet only about 10% of providers routinely screen for IPV exposure. Reasons cited include lacking appropriate tools, fear of disclosure, fear of offending patients, lacking appropriate referrals, and endangering patients. Project Connect is a national initiative to change how adolescent health, reproductive health, and home visiting programs identify and respond to sexual and domestic violence. Research suggests that women in these programs are at high abuse risk, and that evidence-based interventions improve outcomes.

Methods: Semi-structured focus groups and individual interviews are conducted with trained providers. Questions cover satisfaction with training, knowledge gained, implementation, cultural competency, and barriers to implementation or policy development. Thematic analysis of data identifies common provider themes.

Results: Providers express satisfaction with training, and awareness and screenings are increased. Providers cite ongoing rapport with patients as helpful to implementation of screening and intervention protocols, but note that service specificity is lacking in universalized interventions. Links between providers and community resources are not always adequate.

Conclusion: Project Connect provides beneficial training in screening and resource development among providers of services to at-risk women and families. Follow-up training and evaluation is needed to individualize and enhance application of tools provided. Providing caregivers with tools and strategies increases identification of and intervention with victims and survivors of domestic and sexual violence.
Title: The Association between Co-occurring Risk Factors and Pregnancy Intention among Women in Virginia

Authors: Selamawit Girma Virginia Commonwealth University; Derek Chapman Virginia Commonwealth University, Virginia Department of Health

Objectives: The aim of this study is to assess the association between these behaviors and exposures and the outcome of unintended pregnancy.

Background: Studies have shown that certain behaviors and exposures may be associated with unintended pregnancy. Some of these behaviors and exposures include alcohol consumption, smoking, intimate partner violence, and stressful events.

Methods: Using three years of data from the PRAMS questionnaire, we conducted bivariate and multivariate logistical analyses in order to determine if there were any associations between each separate factor and unintended pregnancy. Our second step was to determine if multiple risk factors would show an increase in likelihood of unintended pregnancy. Therefore, women with one, two, or three or more risk factors were compared to women with no risk factors in order to assess the association of having multiple risk factors and unintended pregnancy.

Results: Multivariate logistical analyses found that smoking (1-10 cigarettes vs. 0-<1= 1.81 95% CI 1.02-3.35) (11+ cigarettes vs. 0-<1= 1.84 95% CI 1.01-3.25), moderate to high alcohol consumption (4+drinks vs. 0= 1.69 95% CI 1.01-2.86) and high stress levels (4+ Stressful Events vs. None=3.08 95% CI 1.90-4.97) were all significantly associated with unintended pregnancies. The analysis on multiple risk factors found that women with three or more risks were the most likely (5.29 times (95 % CI 2.63, 10.65) to have unintended pregnancies and women with two risks were a close second (3.04 (95% CI 1.72-5.38).

Conclusion: Based on the findings of this study, women with these behaviors and exposures may be at risk for unintended pregnancy and should be considered a target group for family planning programs.
Submitting Author: Melissa, Haslam, Ms., Psychology, Humanities & Sciences College of, haslammd@vcu.edu, 540-907-652

Title: I Want to Talk about Birth Control: Patient Elaboration on Women’s Health Topics among African Americans

Authors: Melissa Haslam, Psychology Department, Virginia Commonwealth University; Grace Denio, Psychology Department, Virginia Commonwealth University; Nao Hagiwara, Ph.D., Psychology Department, Virginia Commonwealth University

Objectives: The goal of the study was two-fold: (1) to examine whether physician gender is associated with female patients’ likelihood of elaboration on women’s health topics; and (2) to explore another potential factor that may encourage female patients to elaborate on such topics.

Background: Women’s health can be a sensitive topic for female patients to discuss with physicians during medical interactions. Intuitively, female patients should feel more comfortable discussing such topics with female physicians than with male physicians. However, empirical findings are somewhat mixed. Some studies have shown that female patients are indeed more open with female physicians about women’s health topics, whereas other studies have shown no such significant gender preference by female patients.

Methods: The study was a secondary data analysis of a longitudinal study of 156 low-income, Black patients’ health. In the parent study, medical interactions between patients and physicians were video-recorded and transcribed. In the present secondary analysis, we used transcripts of 101 female patients and coded (1) whether female patients and their physicians discussed women’s health during the interactions, (2) if they discussed women’s health, whether or not female patients elaborated on such topics, and (3) the degree to which physicians engaged in supportive talk.

Results: Of 101 female patients, 55.4% (n = 56) had women’s health discussions with their physicians. Furthermore, of those 56 patients who discussed women’s health, 67.9% (n = 38) elaborated on such topics. Neither whether patients discussed women’s health nor whether they elaborated on such topics was associated with physician gender. However, our preliminary result indicated that there was a trend, such that the degree of physicians’ engagement in supportive talk was associated with patients’ elaboration on women’s health.

Conclusion: Physician gender tends to receive more attention than other factors when researchers investigate what influences female patients’ willingness to discuss women’s health topics. However, our findings suggest that other factors may play an important role to encourage female patients to discuss and elaborate on their women’s health during the medical interactions. The present study was conducted using an underserved sample—African Americans—who often face not only gender-discordance but also racial-discordance when they interact with physicians. This study adds to the literature of patient-physician communication in women’s health by exploring factors that may encourage discussion between African Americans and racially-discordant physicians. Implications for future studies will be discussed.
ID: 21

**Submitting Author:** Sarah, Javier, BS, Psychology, Humanities & Sciences College of, javiersj@vcu.edu, 850-485-1622

**Title:** Determining Beauty: Body Dissatisfaction Among African American, Asian American, and Latina Women

**Authors:** Sarah Javier, BS, Department of Psychology, Virginia Commonwealth University; Jasmine Abrams, MS, Department of Psychology, Virginia Commonwealth University; Morgan Maxwell, MA, Department of Psychology, Virginia Commonwealth University; Faye Belgrave, PhD, Department of Psychology, Virginia Commonwealth University

**Background:** In the United States, almost 80% of women report being dissatisfied with their body. Body dissatisfaction in Western cultures may stem from an overt societal pressure to internalize the thin ideal, as well as a focus on Eurocentric ideals of beauty. This may create a discrepancy between an individual’s perception of how they actually look and how they aspire to appear. This discrepancy may be especially salient to women of color, who not only have to contend with the thin body ideal but other physical attributes that differ from Western ideals of beauty.

**Objectives:** The main objective of this review was to determine what culturally specific factors are important in determining body dissatisfaction among women of color. Additionally, the authors sought to determine what health outcomes may result among ethnic minority women as a result of body dissatisfaction.

**Method:** The authors conducted an extensive review of current body image literature involving African American, Asian and Asian American, and Latina women. They then determined common themes and differences relating to body dissatisfaction among these three groups.

**Results:** Overall, body dissatisfaction is increasing among women of color, with thin ideal internalization and acculturation acting as risk factors. Additionally, rates of eating disorders and cosmetic surgery are increasing among ethnic minorities. Ethnic identity and identification with native culture function differently for different ethnicities, acting as a protective factor against body image among African American and Latina women, but as a risk factor for Asian women. Finally, the media plays a role in increasing body dissatisfaction by promoting a Eurocentric ideal of beauty that is desirable yet may be unachievable.

**Conclusions:** In conclusion, ethnic minority women experience body dissatisfaction in a variety of contexts and through various mechanisms. Although some commonalities exist among factors influencing body dissatisfaction among women of color, disparities also exist and suggest the need for further research that examine differences and similarities between and within ethnic minority groups. Future research should increase samples of ethnic minority women, include culturally relevant measures, and focus on body dissatisfaction during different developmental stages.
ID: 22

Submitting Author: Dannielle, Kelley, Social & Behavioral Health, Medicine, kelleyde@vcu.edu, 262-402-8833

Title: Media Representations of Intimate Partner Violence: Gender Differences in Attributions of Responsibility

Authors: Kellie E. Carlyle Palazzolo, Ph.D., M.P.H., Assistant Professor and Graduate Program Director, Department of Social and Behavioral Health, VCU School of Medicine; Dannielle E. Kelley, Department of Social and Behavioral Health, VCU School of Medicine

Objectives: To examine how respondent gender mediates attributions of responsibility and sympathy in ways that (a) increase attributions of perpetrator responsibility; (b) decrease attributions of perpetrator responsibility; (c) increase attributions of victim responsibility; and (d) decrease attributions of victim responsibility.

Background: This study used Weiner’s (1980) attribution-emotion-action model to examine how information about perpetrators and victims in news articles about IPV situations influence readers’ attributions of responsibility.

Methods: The survey began by presenting participants with a description of a news story about a man who allegedly hit a woman. Participants were then presented with a list of statements about the perpetrator and were asked to rate, given that particular piece of information, how responsible for the situation they would rate the perpetrator. The same procedure was followed for the victim. Response categories were Likert-type scales ranging from 1 (not at all) to 5 (very much so).

Results: While female and male participants gave fairly high ratings of perpetrator responsibility across all statements, females rated the perpetrator significantly more responsible than males when the perpetrator was “in the military” (F(1, 66) = 7.85, p = 0.01), “suspected his wife of infidelity” (F(1,66) = 18.90, p = 0.00), and was “extremely jealous” (F(1,66) = 5.44, p=0.02). Male participants were significantly more likely to rate the victim responsible if she had “no visible injuries” (F(1,66) = 4.16, p = 0.045).

Conclusion: These findings suggest that distinct differences exist in how females and males assign attributions of responsibility in an IPV news story, highlighting the importance of how the media frames messages of IPV to influence perceptions of responsibility. By understanding how statements influence perceptions of IPV, media outlets can become more effective in serving as advocates against IPV and use media exposure as a means to provide information about where people experiencing IPV can go for help. Furthermore, media outlets should be conscious of how they report information on IPV in order to avoid stereotyping the perpetrator and the victim.
ID: 23

**Submitting Author:** Michelle, Laws, PhD Student, Social &Behavioral Health, Medicine, lawsma@vcu.edu, 919-475-6388

**Title:** Having Our Say: Women Living in A Historically Marginalized Community Discuss Barriers to Health Management and Services Utilization

**Authors:** Michelle Laws, Department of Social and Behavioral Health, VCU School of Medicine

**Objectives:** The objectives of this study were to explore the health beliefs and attitudes of poor black women about the causes of high STI rates among their population, barriers to health care service utilization and factors influencing their self management behaviors.

**Background:** Often historically marginalized populations (e.g. poor, ethnic minority women) are considered in the context of public health research subjects and recipients of services and rarely as research partners who can contribute significantly to the design of health services and interventions. The exclusion of women from poor communities at the front end of the research process can often lead to ineffective health interventions and unsuccessful health promotion endeavors, resulting in little or no results in terms of creating positive change in health behaviors. Poor women are often situated at the intersection where poverty, environment, and behavior merge to create health disparities across the disease spectrum and as a result, their perspectives can prove invaluable in the design of effective health interventions for poor and underserved populations.

**Methods:** Data will be presented from a mixed-methods study consisting of survey (n=105) and focus group (n=15) data collected from women living in a public housing community in Richmond. Objectives: The objectives of this study were to explore the health beliefs and attitudes of poor black women about the STIs and sexual risk behaviors, health management and health seeking behaviors.

**Results:** More than 60% of the respondents reported mental health services as a major need to improve their overall health and the majority of women saw mental health linked to their physical health. Psychosocial stress from family and intimate partners was identified as a major barrier to seeking and utilizing health care services to manage physical health.

**Conclusion:** The major findings from this study support the need for more tailored health interventions and health promotion policies that are created through a community-engaged or CBPR process; and the importance of a blended health services that include public and mental health services. The results also underscore the important role that cultural norms play on how health risks are conceptualized and health promotive behaviors are adapted.
ID: 24

Submitting Author: Ellyn, Leighton-Herrmann, Doctoral Candidate, Social &Behavioral Health, Medicine, ellynlh@gmail.com, 804-628-1127

Title: Using upward communication to promote cancer screening in adult women: An adolescent-initiated intervention

Authors: Ellyn Leighton-Herrmann, M.A., Department of Social and Behavioral Health, VCU School of Medicine; Maghboeba Mosavel, PhD, Department of Social and Behavioral Health, VCU School of Medicine

Objectives: We developed an intervention that focused on adolescent girls to help persuade their female kin to obtained screening.

Background: Disproportionately more African American women continue to die from cervical, breast and colon cancers in comparison to White women; prompting the need for a culturally relevant intervention to encourage regular screening.

Methods: The pilot study assessed feasibility and consisted of an interactive workshop that provided girls (n=22) with tailored cancer screening recommendations for their mother or relative. Control group girls (n=14) were provided a pamphlet with information about cancer screening guidelines for the three types of cancer and how to encourage their female relative to get screened. They were not specifically asked to share the pamphlet or information with their relative. We followed up with the 36 (N=72) dyads about 6 months later.

Results: Sixty-four percent of the control adolescents reported sharing the pamphlet or information with their relative. Eighty-seven percent of the intervention adolescents reported sharing their screening message. Based on the adolescents’ motivation, several of the adults got screened, made an appointment to get screened, and/or talked to their doctor about getting screened. In addition, the majority of adolescents and adults indicated that because of this experience, they talked with each other about cancer in more detail and/or about other health related topics.

Conclusion: Although a pilot study, these results have implications for daughter-initiated health interventions directed at family members.
ID: 25

Submitting Author: Meaghan, Munn, Research Assistant, Epidemiology & Community Health, Medicine, munms2@vcu.edu, 804-572-5815

Title: Proximity to public housing development and the rates of infant mortality and preterm birth

Authors: Meaghan Munn, BS, MPHc, Division of Epidemiology, Department of Family Medicine and Population Health, School of Medicine, Virginia Commonwealth University; Phillip Archer, PhD, Associate Professor, Department of Natural Sciences, Virginia Union University; Saba Masho, MD, MPH, DrPH, Associate Professor, Division of Epidemiology, Department of Family Medicine and Population Health, School of Medicine, Virginia Commonwealth University

Objectives: The objective of this study is to determine if proximity to public housing developments results in any significant effects on adverse birth outcomes for women living in the city of Richmond, Virginia.

Background: Reducing rates of adverse birth outcomes for all mothers is a central focus of public health efforts to eliminate health disparities. This study examined the statistical significance of adverse birth outcomes among women who live near inner city public housing developments (PHDs).

Methods: Vital record data were examined on births occurring in Richmond, Virginia. Birth data and PHDs in Richmond were geocoded using ArcGIS v10. A buffer radius of 1,000 feet from each PHD was created and all births that fell within zone were designated as near the PHD. Birth outcomes of women living near PHDs were compared to those outside the buffer zone. Multivariable logistic regression was used to model the relationships of preterm birth and infant mortality to those living near PHDs. Potential confounders were assessed by the 10% change in estimate method and adjusted odds ratios with confidence intervals were calculated.

Results: A total of 30,554 live, singleton births occurred in Richmond City from 1997 to 2007 with 3,417 (11.2%) living near a PHD. The rates of preterm birth and infant mortality were significantly higher for those living near PHDs compared to those who lived more than 1,000 feet from a public housing development. The model for infant death was adjusted for education, race, and paternal presence, while the model for preterm birth was adjusted for maternal race, education, adequacy of prenatal care, and paternal presence. The adjusted logistic regression model showed that the odds of infant death (aOR=1.38; 95%CI: 1.04-1.84) and preterm birth (aOR=1.19; 95%CI: 1.07-1.33) remained higher for those living 1,000 feet from PHDs after controlling for confounders.

Conclusion: Women living near PHDs have significantly higher rates of adverse birth outcomes compared to those not living near PHDs. PHDs can be utilized as a public health tool to improve maternal and child health by expanding the availability of health services at these locations.
Conclusions: Results from this analysis identified modifiable factors such as obesity, nutritional intake, alcohol consumption and systemic inflammation that are potentially modifiable risk factors that could be addressed to reduce the disparities in breast cancer. Socioeconomic factors may also influence breast cancer outcomes. These factors need to be studied in depth in order to reduce disparities in outcomes for African American women with early-stage breast cancer. Current disparities in breast cancer morbidity and mortality should include a focus on baseline lifestyle behavior differences as well as dissimilarities in the inflammatory status of patients and not wait to address these factors until the conclusion of active treatment.
**ID: 27**

**Submitting Author:** Caroline, Orr, Ms., Social & Behavioral Health, Medicine, orrca@vcu.edu, 252-531-4542

**Title:** Mother-Daughter Dyads: Comparing Breast and Cervical Cancer Knowledge

**Authors:** Maghboeba Mosavel, Dept. of Social and Behavioral Health, VCU School of Medicine; Maureen Wilson, Dept. of Social and Behavioral Health, VCU School of Medicine; Kellie Palazzolo, Dept. of Social and Behavioral Health, VCU School of Medicine; Caroline Orr, Dept. of Social and Behavioral Health, VCU School of Medicine.

**Objectives:** This study compares the attitudes and beliefs of low-income, urban, African American mothers and daughters regarding cervical and breast cancer screening.

**Background:** Mothers and daughters share a powerful and unique bond, which has potential for the dissemination of information on a variety of women’s health issues. Parents influence their children’s general beliefs, values and behaviors and it is therefore reasonable to postulate that parents can influence their children’s health behaviors. These bi-directional communication patterns and influences are particularly interesting, and, of particular importance to health promotion efforts directed at women’s health concerns. The promotion of early detection for cancer is one such women’s health issue that lends itself to the study of bi-directionally and especially, if daughters can influence their mothers’ regular screening behaviors.

**Methods:** Mothers and daughters were asked questions assessing breast and cervical cancer knowledge, as well as HPV knowledge. They were queried regarding perceived barriers to cancer screening, their attitudes toward screening, perceived barriers to care and perceived susceptibility to cancer.

**Results:** Thirty-two African American mother-daughter dyads participated in the interviews. Mother-daughter dyads had comparable levels of knowledge and beliefs regarding cervical cancer. There was no difference between mothers and daughters regarding believing there are other types of cancer more serious than cervical cancer with most strongly agreeing. However, there was a difference regarding believing cancer could be treated if found early with mothers more likely to strongly agree. Mother-daughter dyads also had comparable levels of knowledge and beliefs regarding breast cancer; however, mothers and daughters disagreed about the statement that breast cancer can be treated if found early, with mothers more likely to strongly agree. Most mothers (69%) but fewer daughters (53%) reported being familiar with HPV.

**Conclusion:** The comparison of mother-daughter attitudes and beliefs about cancer and early detection provides further insights about cancer knowledge within the family. Most of these mothers had accurate knowledge about cancer and it seems as if their daughters also had positive attitudes about prevention. The high concordance rates between mothers and daughters suggest that the mother-daughter dyad could potentially be a viable unit to harness for the dissemination of targeted follow up screening information. Future research should explore the bi-directional flow of health information, such as the specific role of the daughter in the construction of family health knowledge.
ID: 28

**Submitting Author:** Roseann, Peterson, Postdoc, Human & Molecular Genetics, Medicine, repeterson@vcu.edu, 612-298-9363

**Title:** On the association of common polygenic variation with body mass index across adolescent development: A longitudinal twin study.

**Authors:** Roseann, Peterson, Human and Molecular Genetics, VCU; Hermine, Maes, Human and Molecular Genetics, VCU;

**Objectives:** Further research should address when during human development these variants begin to influence body weight. Therefore, we sought to utilize a developmental twin study design in order to determine the genetic and environmental architecture of BMI by variance components analysis and assess the effects of adult-validated BMI-SNPs across adolescence.

**Background:** A dramatic increase in the prevalence of obesity in developed countries and the numerous adverse consequences associated with elevated body weight in both children and adults highlight the necessity of research that aims to understand the genetic and environmental trajectories of relative body weight. Genome-wide association studies of body mass index (BMI) using large-scale adult samples have yielded 32 robustly associated genetic variants.

**Methods:** Data analyses included 2,794 twin participants from the Virginia Twin Study of Adolescent Behavioral Development (ABD) ranging in age from 8 to 18 years old. BMI was calculated from weight and height for up to three waves of data collection. Variation in BMI at each age, as well as covariation across the age range was modeled using the independent pathway (IP) models which includes both genetic and environmental common and time-specific factors. To understand the importance of adult BMI-associated genetic variants across adolescent development, a genetic risk sum score (GRSS) was tested as an effect on latent genetic factors as well as on mean BMI.

**Results:** BMI was found to be highly heritable, accounting for 74-91% of the variance over the course of adolescent development and exhibited sex differences. Our best-fitting model indicated multiple genetic factors that contributed to BMI liability and shared environmental effects were found to account for significant portions of the phenotypic variance (1-18%) for ages 11-16 in females and ages 8-14 in males. Preliminary results indicated that the GRSS was best modeled as an effect on mean BMI at each age group suggesting association across development with the magnitude of the effect differing at each time point considered and accounted for 1-2.3% of the phenotypic variance in BMI across adolescence.

**Conclusion:** These results, although preliminary, merit future research, which considers pubertal stage, both in the full ABD sample and additional replication cohorts.
ID: 29

Submitting Author: Michell, Pope, African American Parent-Adolescent Communication About Health and Body Image, Psychology, Humanities & Sciences College of, popema2@vcu.edu, 804-337-9093

Title: African American Parent-Adolescent Communication About Health and Body Image

Authors: Michell, Pope, African American Parent-Adolescent Communication About Health and Body Image, Psychology, Humanities & Sciences College of; Rosalie Corona, Ph.D, Department of Psychology, Virginia Commonwealth University

Objectives: To examine the health and body-related messages caregivers convey to their adolescent daughters (11-14 years old).

Background: The rate of obesity among African Americans is a major public health threat (CDC, 2009). Prior research suggests that African American girls’ acceptance of a larger body size, negative attitudes toward physical activity and/or inability to see the long-term benefits of physical activity may influence girls’ health attitudes and behaviors (Mabry et al., 2003; Shen et al., 2012). Thus, studies examining the factors that may influence African American girls’ body image are needed (Levine & Smolak, 2011; Neumark-Sztainer et al., 2006).

Methods: We conducted semi-structured interviews with 25 caregiver-adolescent dyads. Interviews were transcribed and coded.

Results: Caregivers play an important role in shaping girls’ body image attitudes and behaviors. In the theme, *What Others Say Matters*: 80% of girls recalled receiving positive body-related feedback (“She’s always giving me compliments”); 32% recalled being teased or pressured to lose weight or teased about their weight (“She tells me if I’m gettin’ too fat”); and 32% reported receiving maternal advice related to healthy lifestyle choices (“She trying to help me to lose some weight so that I won’t be obese...‘Cause she don’t want me to end up dying, getting high blood pressure, diabetes...and that I need to stop eating junk food and candy”). Similarly, 64% of caregivers recalled providing positive comments, (“I try to give her positive feedback...I tell her I like her shape”); 16% pressured/teased their daughters about their weight (“She calls me fat, I call her fat”); and 36% reported conveying health-related information (“I’m concerned about her health, ...because, African Americans, we got health problems”) and/or nutritional guidance (“She act like she don’t’ want to eat...I say you not gonna lose weight like that, you gotta eat vegetables and fruit”).

Conclusion: Efforts to reduce rates of obesity and health disparities may lie in improving girls’ body image attitudes. Results suggest that ongoing parent-child communication promoting positive body image, providing access to healthy foods and opportunities for physical activities are important to girls’ health outcomes.
**ID:** 30

**Submitting Author:** Sarah, Price, Associate Professor, Social Work, skprice@vcu.edu, 804-828-579

**Title:** Bridging the mental health services gap for low-income women with perinatal depression: Results from a community-based translational research pilot

**Authors:** Sarah Kye Price, PhD, MSW, School of Social Work; Lisa Gray, MSW, School of Social Work; Dalia El-Khoury, M.Ed., School of Social Work; Saba Masho, MD, MPH, DrPH, Department of Epidemiology and Community Health, School of Medicine

**Objectives:** Our study compared the efficacy of the Enhanced Engagement (EE) model, a brief psychosocial and service enhancement intervention infused within usual care MCH home visiting. The consumer-informed EE model is grounded in motivational interviewing, interpersonal psychotherapy, and cognitive-behavioral therapy.

**Background:** Low-income and ethnic minority women experience barriers to accessible, affordable, and timely treatment of depression occurring during and around the time of pregnancy. Maternal and child health (MCH) home visiting programs may play an integral role in identifying and addressing depression, particularly when traditional mental health services are not readily available.

**Methods:** The quasi-experimental mixed methods design compared team delivered EE with usual care home visiting which also included mental health support (N=25). Quantitative group x time analysis examined hypothesized decreases in depressive symptoms (PHQ-9) and increases in social support (SSQ-R). Qualitative content analysis examined post-intervention spontaneous recall of intervention content between groups. Program data and record reviews compared cost-benefit and service utilization outcomes.

**Results:** A repeated analysis of variance model revealed significant decreases in depressive symptoms (PHQ-9; \( t = -3.24, p = 0.0036 \)) and increases in perceived social support associated with the intervention (SSQ-R; \( t = 3.35, p = 0.0027 \)). There were no significant pre-post differences in the usual care group. Content analysis demonstrated more frequent and specific working content recall in the intervention group over usual care. The intervention group had fewer failed visits, greater service engagement, and fewer staff hours spent in crisis intervention between visits.

**Conclusion:** Enhanced Engagement may be a viable brief intervention to reduce symptoms of depression and enhance social support in women receiving maternal and child health home visiting. The quantitative, qualitative and cost-benefit outcomes from this pilot study offer a promising foundation for future research and replication of the model, particularly in communities where service utilization barriers preclude or delay traditional mental health treatment.
ID:31

**Submitting Author:** Carla, Shaffer, MS, Psychology, Humanities & Sciences College of, cmroca@vcu.edu, 804-873-8755

**Title:** Talking about Dating Violence with Latina Teens

**Authors:** Carla Shaffer, Psychology, VCU College of Humanities and Sciences; Vanessa Fuentes, Psychology, VCU College of Humanities and Sciences; Rosalie Corona, Psychology, VCU College of Humanities and Sciences

**Objectives:** Learning Objective #1: To obtain rich descriptions of the dating violence-related topics that are discussed between parents and their Latina teens, between Latina teens and peers.

Learning Objective #2: To obtain rich descriptions of barriers and supports to Latina adolescents’ help-seeking patterns.

**Background:** Adolescent dating violence is a prevalent and disconcerting reality for many adolescents. Communication with others (e.g., parents, friends) about dating violence may buffer some negative outcomes associated with experiencing dating violence. Although researchers are attending more to this public health problem, what we know about the messages that adolescents receive about dating violence is limited, especially for Latina teens.

**Methods:** To address this gap in the literature, we interviewed 18 Latina adolescents (14-17 years) and their mothers to explore their beliefs about what dating violence means to them, adolescents’ help seeking preferences and behaviors, messages that are shared about dating violence with mothers or friends, and reasons for and against talking with parents about problems in dating relationships. Interviews were transcribed and coded for emergent themes.

**Results:** Parental messages about dating problems focused on “being safe” while friend-based messages focused on “trying to work it out or get out of the relationship.” Barriers to seeking help from parents included feeling “concerned about anticipated parental response” and that the “topic is uncomfortable or we don’t know how to talk about it.” Themes of supports to seeking help from parents included having a “close and trusting relationship” and having had “an established pattern of communication.”

**Conclusion:** Results suggest that the dating violence messages that Latina adolescents receive differs by who is giving the message (parents vs. peers) and that Latina teens may hesitate talking to their parents about problems in dating if they fear negative parental reactions or they do not sense that parents can effectively facilitate the conversations. Given that many victims of dating violence do not tend to disclose their dating problems or seek help, our results highlight the importance of informing parents and peers on how to respond when their daughter/friend experiences dating problems.
ID: 32

Submitting Author: Sara, Varner, Epidemiology & Community Health, Medicine, sbvarner@vcu.edu, 804-828-8012

Title: Behavioral impact of poor birth outcomes on subsequent pregnancies: A study of Virginia PRAMS 2007-2010

Authors: Sara, Varner, Epidemiology & Community Health, Medicine; Saba Masho, MD, MPH, DrPh, Department of Family Medicine and Population Health, Division of Epidemiology, VCU; Derek Chapman, PhD, MS, Department of Family Medicine and Population Health, Division of Epidemiology, VCU

Objectives: To examine the impact of a poor birth outcome on cigarette smoking and alcohol use during a subsequent pregnancy.

Background: Considering that 1 of every 8 infants in the U.S. is born preterm, much research has focused on the modifiable causes of the problem. Both cigarette smoking and alcohol use during pregnancy have been associated with preterm birth. The present study seeks to determine whether a previous preterm or low birthweight delivery impacts maternal smoking and drinking during the subsequent pregnancy.

Methods: The 2007-2010 Virginia Pregnancy Risk Assessment Monitoring System (PRAMS) and linked birth certificate data was used for the present analysis. Women who reported smoking and/or drinking were categorized as having engaged in risky behavior. Women were asked whether their previous baby was born preterm or low birthweight; a “yes” to either resulted in categorization of previous poor birth outcome.

Results: Results: The final sample included 1101 women who reported a previous live birth; 16.4% (n=262) of which resulted in a poor birth outcome; 21% of the sample reported risk behavior during the subsequent pregnancy. Logistic regression analysis revealed no statistically significant differences in risk behavior between women who had experienced a poor birth outcome in their previous pregnancy and those who had not.

Conclusion: Conclusion: Prior history of preterm birth has no impact on women’s smoking behaviors on subsequent pregnancy. The occurrence of a preterm birth presents a critical intervention point for medical providers to educate women on the risks of repeated preterm and high-risk behaviors during a subsequent pregnancy.