DMU MENTORED STUDENT RESEARCH PROGRAM

July 18, 2014

Des Moines University
Olsen Center
Des Moines, IA 50312

RESEARCH IS VITAL AND AT DMU STUDENTS ARE VITAL TO RESEARCH.

DES MOINES UNIVERSITY

DMU Mentored Student Research Program
July 18, 2014
Des Moines University, Des Moines, IA

Dear Mentored Students

On behalf of the research and grants committee, welcome to the Mentored Student Research Program closing program. This event represents and celebrates the culmination of your summer research experiences. We know you have worked hard over the last eight weeks, worked through challenges in the laboratory, learned new skills, and built new professional relationships. Many of you will continue to work on your respective research projects over the coming academic year, and we encourage you to do so.

The goal of the mentored research program is to provide opportunities for students to develop their skills as researchers by receiving coaching and mentorship by faculty. Dissemination of new knowledge, by faculty and student researchers, supports Des Moines University's mission. You have contributed to the fulfillment of this mission by your participation in the Mentored Student Research Program. We encourage you to continue developing as a researcher, and thank you for your hard work this summer.

This program would not be possible without the support of many individuals and departments across campus. The University has invested in this program financially, researchers across campus have taken the time to deliver research talks, and your mentors have invested time in your professional growth and education. Please take the opportunity to thank your mentors for their investment this past summer.

I wish you the best of luck in your future endeavors!

Sincerely,
Dr. Reimer

Rachel Reimer, PhD
Associate Professor, Chairperson and Program Director, Master of Public Health Program
College of Health Sciences, Des Moines University
515-271-1432
Rachel.Reimer@dmu.edu

Table of Contents

Agenda

9 am **Registration and Poster Viewing**

9:30 am **Welcome**

Jeffrey Gray, PhD

Vice President for Research, Director of Master of Science in Biomedical Sciences, Professor of Microbiology and Immunology, *Des Moines University*

9:45 am **Student Keynotes**

- Variation in Carbohydrate Utilization by Trichomonads of Man Inhabiting Distinct Anatomical Niches
  Blake Chapman, DO'17, *Wayne A. Wilson, PhD, Andrew Brittingham, PhD*
- Evolution of Coyote Mandibles in Response to Introduction of Competitors and Megafaunal Extinctions
  Adrianna Janowicz, DO'17 *and Julie A. Meachen, PhD*
- Comparison of Arch Height Index in Individuals With and Without Plantar Heel Pain
  ****Tiffany McCarthy*** *and Shane McClinton, DPT*
- Basic Access and Health Insurance: Informing Policymakers Regarding Public Survey Data
  Hannah Reiland, DO'17 *and Pamela A. Duffy, PhD*

10:45 am **Introduction**

Rachel Reimer, PhD

Associate Professor, Chairperson, and Program Director - Master of Public Health, Chair of the Research and Grants Committee

Keynote Address: Racial Discrimination and HIV-Risk Cognitions and Behaviors Among African American Young Adults

Michelle Stock, PhD

Associate Professor of Applied Social Psychology, The George Washington University

- Provide an overview of HIV among African-Americans
- Explain the impact of racial discrimination on substance use and risky sex cognition's and behaviors

11:45 am **Lunch and Poster Viewing**

1 pm **Closing Words**

Keynote Speaker

Michelle Stock, PhD

Associate Professor of Applied Social Psychology, The George Washington University

Dr. Stock received her PhD from Iowa State University. Her research focuses on applying social-psychological theories to the study of risky health cognitions and behaviors, including substance use, sexual behaviors, and UV exposure. Her experimental and survey research focuses on the application of dual-processing models, in particular the Prototype-Willingness model, to provide a framework for understanding the cognitive (both heuristic and reasoned) constructs and situational factors that affect health decisions.

The research conducted in her lab can be split into three main areas:

- the relation among risk behavior, social comparison, and perceptions of risk
- applying social psychological theory and the Prototype-Willingness model to health interventions
- examining the relation between racial discrimination and risky health cognitions and behaviors as well as risk and protective factors that may help explain and that may reduce this relation

Presenting Author Index

Student Keynote Abstracts

Variation in Carbohydrate Utilization by Trichomonads of Man Inhabiting Distinct Anatomical Niches

Blake S. Chapman, DO'17[1], Wayne A. Wilson, PhD[2], Andrew Brittingham, PhD[1]

[1] Microbiology and Immunology, Des Moines University, Des Moines, IA
[2] Biochemistry and Nutrition, Des Moines University, Des Moines, IA

There are three Trichomonads that infect humans; *Trichomonas vaginalis* in the urogenital tract, *T. tenax* in the mouth, and *Pentatrichomonas hominis* in the intestines. *T. vaginalis* is the most common protozoan infection in industrialized nations, afflicting over 160 million people worldwide annually. *P. hominis* and *T. tenax* are generally regarded as non-pathogenic commensal flora. Several reports have shown that all 3 species can metabolize and grow in media supplemented with either glucose or maltose, and *T. tenax* and *T. vaginalis* are reported to grow on glycogen as well. The carbohydrate metabolism of *P. hominis* is less well defined. Our hypothesis is that the different niche inhabited by each species would require that they could metabolize different carbohydrates. We compared the growth of all 3 species of trichomonads in media supplemented with 7 different carbohydrates. All 3 species grow on glucose, glycogen, and galactose; however, *T. vaginalis* required 24-40 hrs of adaptation before growing in galactose. Only *P. hominis* grew in media supplemented with sucrose or raffinose, but required a 40 hour period of adaptation. None of the organisms grew on trehalose, and only *P. hominis* showed modest growth on cellobiose. Our studies show that the species of trichomonads infecting man demonstrate differing patterns of carbohydrate utilization which may be related to the ecologic niche in which they are found. Future studies will be aimed characterizing the delayed/adaptive growth of *P. hominis* in sucrose and *T. vaginalis* in galactose, as well as the expression of the enzymes involved in carbohydrate metabolism.

Evolution of Coyote Mandibles in Response to Introduction of Competitors and Megafaunal Extinctions

Adrianna Janowicz, DO'17 and Julie A. Meachen PhD

Coyotes are rapidly rising in population in the United States and their presence can be problematic for urban-dwellers and farmers. Their success and survival can be attributed to their labile habits and their ability to co-exist with humans. They can adapt their diet to include anything from garbage to small mammals such as chipmunks and rabbits. Recent studies have shown the evolution of coyote limbs due to niche changes between the Pleistocene and Holocene epochs as a result of megafaunal extinctions and an introduction of a new competitor, the gray wolf. Similarly, we expect to find morphological changes in the mandibles throughout these epochs. By measuring the mandibles of Rancho La Brea coyotes, we can follow their evolution due to such dietary changes as a result of extinctions and/or the introduction of new competitors. We examined 13 landmarks from various coyote mandibles using 2-D geometric morphometrics to track their evolution from the Pleistocene (≈28ka-13ka) to the early Holocene (≈10ka) and through modern times. We found that the mandible gradually changed shape and the grinding surface increased in length through time. In the Pleistocene, the mandibles were deepest and became shallower and more curved towards the ramus as time progressed. This evolution of the coyote mandibles suggests a change in their ecological niche from a highly carnivorous diet filled with hard foods, such as bone, to a more omnivorous diet of softer foods.

Comparison of Arch Height Index in Individuals With and Without Plantar Heel Pain

Tiffany McCarthy[1] and Shane McClinton, DPT, OCS, FAAOMPT[2]

[1] Drake University, Des Moines, IA
[2] Physical Therapy Clinic, Des Moines University, Des Moines, IA

Background: Arch height index (AHI) has been used to describe foot arch structure and mobility. The measure is reliable and thought to have clinical relevance; however, most studies have only examined healthy subjects. The purpose of this study was to investigate differences in AHI between individuals with and without plantar heel pain (PHP).

Methods: Patient characteristics including sex, age, and body mass index (BMI) were compared for the involved side of 27 individuals with PHP, the uninvolved side of 16 individuals with unilateral PHP, and 34 control using ANOVA and a chi-square test. Digital photography was used to determine AHI defined as arch height at 50% of total foot length divided by total foot length. Participants were positioned in four weight bearing conditions for AHI measurement. Comparisons between the 3 groups were made for each weight bearing condition using MANCOVA. Individuals with PHP demonstrated a higher BMI than the control group (p=.017) and BMI was the covariate.

Results: MANCOVA demonstrated no significant difference between individuals with and without PHP ($p=.637$, $\eta_\rho^2= 0.042$, power=0.343).

Conclusion: Despite observations of arch structure and mobility dysfunction in individuals with PHP, the AHI was not able to detect differences in this sample. The AHI measure is contingent primarily on vertical excursion of the arch and may not capture dysfunction that occurs in multiple directions. The results of this study should be interpreted with caution as it was underpowered, and there is an increased chance that the AHI may be able to detect between group differences.

Basic Access and Health Insurance: Informing Policymakers Regarding Public Survey Data

Hannah Reiland, DO'17 and Pamela A. Duffy, PhD

Introduction: The health and wellness of our nation and of states has been measured over the years by various surveys. The results of these surveys have been instrumental in informing the public and influencing policy. Health indices such as America's Health Rankings® and the Gallup-Healthways Well-Being Index gather data to create a state ranking system, assessing states on a yearly basis. AHR aggregates multiple sources to create their rankings. G-H collects public polling data to arrive at 6 categories of well-being and then ranks states based on the composite. Because the AHR system relies in part on Behavioral Risk Factor Surveillance System (BRFSS) data, there is an approximate 2-year lag in obtaining this information. Comparing the two indices may help policymakers evaluate their individual state's progress in health measures and set policy.

Purpose: The purpose of this study is to examine the correlation between information derived from the Basic Access category of the G-H Well-Being Index with the AHR lack of health insurance rates for the years 2008 through 2012.

Results: Preliminary results demonstrate a statistically significant correlation between the two variables. Limitations of the study include that only publicly available data were used, and not all categories of either index were analyzed.

Conclusions: Based on this study, the G-H WBI may be a reasonable proxy for assessing a state population's access to health services, in place of knowing the actual rate of uninsurance. The G-H WBI may have advantages for policymakers who desire current data to inform their decisions.

Keywords: Gallup-Healthways Well-Being Index, America's Health Rankings®, access to healthcare, well-being, state rankings, uninsured, health policy

Poster Abstracts

♦ 1 ♦

AT_1R Activation Contributes to Reflex Vasoconstriction in Aged Skin

Kelsey Kolb, DPT'16, Bindiya Shah, DO'17, Kevin Smaller, Terri Plundo, DO, James A. Lang, PhD

Stimulation of the angiotensin type I receptor (AT_1R) elicits vasoconstriction (VC) and this may be occurring through the activation of pathogenic vascular pathways such as Rho kinase (ROCK). We hypothesize that the reflex cutaneous VC response to whole-body cooling (T_{sk} = 30.5 C) in older humans relies in part on AT_1R activation, which may explain greater ROCK activity attendant with aging. Two microdialysis (MD) fibers were placed in the forearm skin of 2 young (Y) (18-30 yrs) and 3 older (O) (60-85 yrs) individuals for infusion of 1) lactated Ringer's solution (control) and 2) AT_1R blockade with losartan. Laser Doppler flux (LDF) was measured over each MD site and cutaneous vascular conductance was calculated as CVC = LDF/MAP and expressed as a percent change from baseline (%ΔCVC). The VC response to cooling was blunted in older individuals (Y = -29, O = -14. %ΔCVC), and this was further attenuated at the losartan site (Y = -27, O = -8 %ΔCVC). The VC response to exogenous angiotensin II (Y = -34, O = -34 %ΔCVC) was completely blocked in sites pretreated with losartan or with fasudil, a ROCK antagonist. This data indicates that AT_1R contributes to the reflex VC response in aged but not young skin, and suggests that the VC from angiotensin II is mediated primarily through a ROCK-mediated mechanism. Thus, the central pathological influence of angiotensin II may potentially be due to its role in activating ROCK.

♦ 2 ♦

L-tyrosine Supplementation as a Strategy to Improve Sympathetic Adrenergic Function in Older Adults

Bindiya Shah, DO'17, Kevin Smaller, James A. Lang, PhD

Older adults exhibit a reduction in the sympathetic-mediated vasoconstriction (VC) and pressor response, which decrease their ability to maintain core temperature during cold exposure and regulate blood pressure during exercise. We hypothesize that oral supplementation of L-tyrosine, the primary substrate for catecholamine biosynthesis, will 1) increase reflex cutaneous VC to gradual whole-body cooling (T_{sk}=30.5^{0}C) and 2) augment the pressor response to isometric handgrip exercise. Young (18-30 yrs) and older (60-85 yrs) subjects will ingest L-tyrosine (150 mg/kg) or placebo an hour prior to the experiment. After which, heart rate (lead II electrocardiography) and blood pressure responses will be assessed during 3 min of brachial occlusion occurring immediately following 2 min of static forearm contraction using a hand grip dynamometer (35% maximal voluntary contraction). This will be repeated during the peak of the 45 min whole-body cooling period. Cutaneous and forearm vascular conductance (CVC and FVC) was measured with laser Doppler flowmetry and venous occlusion plethysmography, respectively. In one subject that completed the study, mean arterial pressure (baseline: 86 mmHg) increased during both exercise bouts and was maintained throughout post exercise ischemia (before cooling: 108 mmHg, peak cooling: 110 mmHg). Compared to baseline, whole-body cooling reduced peripheral blood flow (ΔFVC =2.02, ΔCVC = 0.06). Pending completion of data collection, oral L-tyrosine supplementation may have future implications of reducing temperature-related illness and improving the tolerance of increased work in older adults.

♦ 3 ♦

Viability of Below Knee Amputation After Failed Reverse Sural Artery Flap for Lower Extremity Limb Salvage

Kelsey Sukovaty, DPM'17, Katherine Frush, DPM, Collin Pehde, DPM

Heel ulcers are very difficult to treat due to the demand of the area. One very effective way to gain durable coverage of the region is to use a reverse sural artery flap. Reverse sural artery flaps are not only useful in repairing heel ulcers, but also other areas of the foot as well as lesions on the lower leg. Reverse sural

artery flaps are an island of skin from the lower lateral aspect of the leg containing the lesser saphenous vein, median superficial sural artery, and sural nerve. The flap is pivoted at the pedicle above the lateral malleolus and sutured onto the defect. These flaps are very successful, but there are still failure rates, which lead to many problems to salvage the limb, ultimately leading to amputation.

The purpose of this study is to view the viability of below the knee amputations after failed reverse sural artery flaps for limb salvage. Five medical charts of patients who have had a below knee amputation following a failed reverse sural artery flap will be de-identified and retrospectively analyzed. Lab results and medical charts from post-operative office visits will be examined for various aspects such as complications, infections, and total time to healing. The results of this study are expected to show a positive result to a below knee amputation following the failure of the flap.

♦ 4 ♦

Cytosolic Phospholipase A2 is Required for Human Smooth Muscle Cell Proliferation to Platelet Derived Growth Factor BB

Faiza Choudhry, DO'17[1], Forrest R[1], Powell J[2], Kevin Carnevale, MD[2]

[1] Pathology, Microbiology, and Immunology, University of South Carolina School of Medicine, Columbia, SC
[2] Microbiology and Immunology, Des Moines University, Des Moines, IA

Platelet derived growth factor BB (PDGF BB) has an important influence on smooth muscle cell proliferation in restenosis and atherosclerosis. Our understanding of different signal transduction pathways involved in the response of smooth muscle cells to PDGF BB is potentially significant for understanding and manipulating these processes. Prior studies have demonstrated a crucial activation of cytosolic phospholipase A2 (cPLA2) in smooth muscle cells to PDGF BB with the production of arachidonic acid and prostaglandin E2. In these studies we investigated the role for another PLA2, calcium-independent PLA2 (iPLA2) in comparison to cPLA2 on smooth muscle cell proliferation using CyQuant proliferation assay. Pharmacological inhibitors of cPLA2 were found to substantially inhibit proliferation. AACOCF3 (cPLA2 and iPLA2 inhibitor) and 1,2,4-trisubstituted pyrrolidine derivative (cPLA2 inhibitor), and Cay 10502 (cPLA2α inhibitor) inhibited smooth muscle proliferation where Bromoenol lactone (iPLA2 inhibitor) had no effect. In reconstitution experiments, arachidonic acid fully restored smooth muscle cell proliferation after being treated with 1,2,4-trisubstituted pyrrolidine derivative. These data demonstrate the distinct role of cPLA2 on smooth muscle cell proliferation which is a critical step in the pathogenesis of restenosis and atherosclerosis.

♦ 5 ♦

Cytosolic Phospholipase A2 is Not Required for Human Smooth Muscle Cell Proliferation to Platelet Derived Growth Factor BB

Eric Wideburg, DO'17[2], Powell J[1], Forrest R[1], Kevin Carnevale, MD[2]

[1] Pathology, Microbiology, and Immunology, University of South Carolina School of Medicine, Columbia, SC
[2] Microbiology and Immunology, Des Moines University, Des Moines, IA

Platelet derived growth factor BB (PDGF BB) has an important influence on smooth muscle cell migration and proliferation in restenosis and atherosclerosis. Our understanding of different signal transduction pathways involved in the response of smooth muscle cells to PDGF BB is potentially significant for understanding and manipulating these processes. Prior studies have demonstrated a crucial activation of cytosolic phospholipase A2 (cPLA2) in smooth muscle cells to PDGF BB with the production of arachidonic acid and prostaglandin E2. In these studies we investigated the role of PLA2, calcium-independent PLA2 (iPLA2) in comparison to cPLA2 on smooth muscle cell migration using modified Boyden chamber assay and under agarose migration studies. AACOCF3 (cPLA2 and iPLA2 inhibitor), 1,2,4-trisubstituted

pyrrolidine derivative (cPLA2 inhibitor), and Bromoenol lactone (iPLA2 inhibitor) had no effect on smooth muscle chemotaxis to PDGF-BB in a modified Boyden chamber. Cay 10502 (cPLA2α inhibitor) did not inhibit smooth muscle migration under agarose to PDGF-BB. These data demonstrate there is no distinct role of cPLA2 or iPLA2 on human aortic smooth muscle cell migration to PDGF-BB.

♦ 6 ♦

Anti-Depressant Effect of D-Serine and Ketamine on a Mouse Acute Stress Model

Jake Goodman, Jessica Fae Kline, MBS'18, LiLian Yuan, PhD

Physiology and Pharmacology, Des Moines University, Des Moines, IA

Novel treatments for Major Depressive Disorder (MDD) have been heavily focused on because the traditional treatment, Selective serotonin reuptake inhibitors (SSRI's), can take weeks to show effect. Ketamine, a N-methyl-D-aspartate (NMDA) antagonist, has received a lot of attention due to its proven rapid anti-depressant effect. However, due to Ketamine's dissociative side effects, effort is being placed on finding a drug with similar rapidness of effect, but fewer side effects. D-Serine, an endogenous NMDA co-agonist, received notice because of its effect on NMDA receptors. Our experiments used D-Serine in acute stress mouse models to show it could be considered a potential rapid anti-depressant and looked at the possibility that Ketamine (10 mg/kg) and D-Serine (2.1 g/kg) could work in combination with each other, which would allow Ketamine to be used at a lower dose. Forced Swim Tests (FST), a test commonly used to screen for anti-depression at different time points following injection, tests behavioral changes induced by the drug. Western Blot analyses are performed on hippocampal and prefrontal cortex brain tissue to determine any drug-induced change to targeted signaling molecules. Upon completion of the study, we expect to have a better understanding of the mechanism behind these types of anti-depressants.

♦ 7 ♦

Promotion of Herpes Simplex Virus Type 1 Replication Through Bak and Bax

Matthew D. Mueller, DO'17, Prajakta Pradhan, MS, Marie L. Nguyen, PhD

Microbiology and Immunology, Des Moines University, Des Moines, IA

It's estimated that nearly 70% of Americans are seropositive for Herpes Simplex Virus (HSV) type 1 or type 2. HSV, a member of the *Herpesviridae* family, invades the epithelium of the host where it replicates and is released via destruction of the host cell resulting in ulcerative lesions. Upon initial HSV infection the host cells trigger the intrinsic apoptotic pathway, a caspase-dependent form of programmed cell death. However, later in the infection anti-apoptotic proteins produced by early and late HSV genes block apoptosis from ensuing demonstrating the intricate balance between pro- and anti-apoptotic signals during infection. Previous results in the Nguyen laboratory indicate that caspase inhibitor treatment results in decreased viral replication. In this project, we utilized a genetic approach to study apoptosis during HSV infection. The intrinsic apoptotic pathway is initiated as a result of an altered ratio of pro and antiapoptotic Bcl-2 family members within the mitochondrial membrane. We therefore utilized immortalized Mouse Embryonic Fibroblasts (MEFs) which lack expression of two Bcl-2 family members necessary for intrinsic apoptosis, Bax and Bak. Initially, we confirmed the resistance to HSV-dependent apoptosis in the Bax/Bak null MEFs via infection with the pro-apoptotic recombinant virus HSV-1 vBSΔ27. Subsequently, the Bak/Bax deficient and sufficient cells were infected with HSV-1, and the virus produced was quantified using a plaque assay. Bax/Bak null MEFs produced less HSV-1 than wild type, which supports the importance of the intrinsic apoptotic pathway to the HSV life cycle.

♦ 8 ♦

Autophagy in Herpes Simplex Virus 1 Infected HEp-2 Cells

Felisha Montero, Prajakta Pradhan, MS, Marie L. Nguyen,PhD

Herpes simplex virus 1 (HSV-1) is an enveloped DNA virus which persists within host neurons following initial infection. Viral replication causes conditions ranging from labial mucosal lesions to life-threatening encephalitis. Cellular defenses against HSV-1 include caspase mediated apoptosis. Previous research in the Nguyen laboratory indicated that HSV-1 infected cells treated with the caspase inhibitor, z-VAD-fmk are resistant to apoptosis and produce less virus than untreated controls. Further research indicated that treatment of infected cells with the negative control for this compound, z-FA-fmk, also led to reduced HSV-1 production. Interestingly, these cells also exhibit an altered morphology that differed from both apoptosis and cytopathic effect. One possible explanation is that the HSV-1 infected, z-FA-fmk treated cells underwent autophagy, a process of cellular self-degradation involving specialized endosomes (autophagosomes). The purpose of this study was to investigate autophagy in HSV-1 infected cells. To accomplish this, we infected HEp-2 cells with ICP27-null HSV-1 in the absence or presence of z-FA-fmk and z-VAD-fmk inhibitors. The cells were incubated at 37º C and harvested at 6 hpi. Whole cell extracts were prepared, and the samples subjected to SDS-PAGE with subsequent transfer to nitrocellulose. Immunoblotting was then performed to detect the lipidated form of Microtubule-associated protein 1A/1B-light chain 3 (LC3-II), an approximately 14kDa protein present in autophagosomal membranes. Together, the results of these experiments will provide insight into autophagy during HSV-1 infection.

♦ 9 ♦

Influence of Boric Acid on *Candida albicans* ATP/ADP Ratio

Sixing Liang, DO'17, Martin Schmidt, PhD, Ben Pointer, MBS'18, Michael Boyer, BS

Boric acid is used in treatment of Candida vaginitis. There is evidence showing boric acid inhibiting *Candida albicans* transformation from its commensal yeast form into its infectious hyphal form; however, understanding of specific cellular interactions with boric acid is lacking. Because the apical cytoskeletal expansion from yeast to hyphal form is an ATP exhaustive process, the aim of this study is to investigate the effects of boric acid on ATP/ADP ratio in vivo. Wild-type Sn152 and mutant strain ΔEFG1 (lacking hyphal formation capability) were subjected to boric acid treatment during exponential growth. Cultures were sampled at various time points and analyzed with Abcam® ADP/ATP Ratio Assay Kit. Wild-type Bwp17 was subjected to varying boric acid concentrations and analyzed with the ADP/ATP kit as well. The preliminary data show that ADP/ATP ratio decreases over time with exposure to boric acid and decreases with increasing concentrations of boric acid. These findings suggest that boric acid does not affect ATP production, but hinder processes that utilize a constitutive supply of ATP.

♦ 10 ♦

Mutational Analysis of Acinetobacter Type VI Secretion System Associated Genes in *Acinetobacter nosocomialis* Strain M2

Alexander Woodrow, DO'17 and Michael Carruthers, PhD

Acinetobacter nosocomialis are Gram-negative opportunistic human pathogens, which are associated with nosocomial infections. Infections caused by *Acinetobacter nosocomialis* and related species are becoming more prevalent and increasingly recalcitrant to treatment due to a high incidence of antibiotic resistance amongst *Acinetobacter* spp. The mechanisms that underlie the ability of *A. nosocomialis* to cause disease are poorly understood. Therefore, research on the biology and virulence of *A. nosocomialis*, with the ultimate goal of reducing the morbidity and mortality of disease caused by *A. nosocomialis*, is warranted. Our laboratory has shown the importance of the *A. nosocomialis* type-six secretion system (T6SS) in bacterial competition. There are 13 conserved genes that encode for a core set of proteins responsible for the function and assembly of the T6SS in bacteria. Like in many T6SS producing bacteria, these core

T6SS genes are clustered on the *A. nosocomialis* chromosome. The T6SS gene cluster in *A. nosocomialis* possesses 5 additional genes, termed *Acinetobacter* type six-secretion system associated genes (*asaA, asaB, asaC, asaD, asaE*), with unknown functions. We hypothesize that the *asa* genes are not necessary for T6SS assembly or function. To test this hypothesis, we created un-marked, in-frame deletions of *asaA* and *asaC* in a clinical isolate of *A. nosocomialis* (strain M2). Mutants were generated by Sequence and Ligation-Independent Cloning, subsequent natural transformation of strain M2 and transient expression of the FLP recombinase. The resultant mutants were assayed for T6SS function through their ability to out-compete *Escherichia coli* and secrete a major T6SS secreted protein (Hcp).

♦ 11 ♦

Analysis of *Acinetobacter nosocomialis* T6SS-Dependent Bacterial Killing: Time, Ratio, and Temperature

Marc Allan, DO'17 and Michael Carruthers, PhD

Acinetobacter nosocomialis, a Gram-negative opportunistic pathogen, causes severe and recalcitrant hospital acquired infections, such as ventilator-associated pneumonias, in immunocompromised patients. Our laboratory has shown that *A. nosocomialis* utilizes a secretion system, called the type VI secretion system (T6SS), to out-compete other bacteria. The effects that certain environmental factors, such as temperature and nutrient availability, have on ability of *A. nosocomialis* to outcompete other bacteria, via the T6SS, have yet to be elucidated. To this end, competition conditions were optimized with respect to the time allowed for competition and the ratio between the predator *A. nosocomialis* and the prey *Escherichia coli*. Subsequently, the effect of temperature on this model of competition was determined.

Methods: Competition between strain M2 and *E. coli,* with the experimental variables of time, ratio of predator to prey and temperature, was assessed by CFU enumeration of *E. coli*.

Results: At 1 h at a ratio of 10:1 (*A.n./E.c.*), a 1.5-log reduction in the *E. coli* CFU was observed compared to a complete reduction (6-log) at 2 h. With respect to competition ratio, for 2 h at a 1:1 ratio, *A. nosocomialis* was able to elicit a 2.6-log reduction in *E. coli* CFU. In 2 h at ratio of 1:1, *A. nosocomialis* was able to reduce the *E. coli* CFU by 0.8, 2.3 and 3.4-fold at 25˚C, 32˚C and 37˚C respectively.

Conclusions: These data indicate that the ability of *A. nosocomialis* to out-compete bacteria, such as *E. coli*, in a T6SS-dependent manner is temperature sensitive, rapid and robust.

♦ 12 ♦

A Preliminary Digital MRI Brain Atlas of the Maned Wolf (Chrysocyon brachyurus) and Domestic Dog (Canis familiaris*)*

Christopher Hoisington[1], Cheuk Tang[2], Brian Whyms, DO'16[1], Maria Patestas[1], PhD, Patrick Hof[3], Chet Sherwood[4], Muhammad Spocter, PhD[1]

[1] Anatomy, Des Moines University, Des Moines, IA
[2] Radiology and Psychiatry, Icahn School of Medicine, Mount Sinai, New York, NY
[3] Neuroscience, Mount Sinai School of Medicine, NY
[4] Anthropology, The George Washington University, Washington, DC

There is an ever-growing interest in the canine brain as a model species for ongoing studies in translational neurology and neuroscience. In recent years a number of anatomical and functional atlases of the domestic dog brain have been created, but a caveat in the literature has been a comparative canine brain atlas, which would inform ongoing studies and foster work in evolutionary anatomy. To address this need we created a digital canine brain atlas of the Maned wolf (*Chrysocyon brachyurus)* and the domestic dog (*Canis familiaris*). Using post-mortem magnetic resonance (MR) scans obtained from two maned wolves and two domestic dogs, acquired at 7 Tesla, post-processing of the MRI scans were undertaken using Analyze 10.0. MRI images were imported into the program and every 10th slice was image captured

and saved to a workstation for labeling. Three-dimensional models of the whole brain and relevant subcortical structures were created using semi-automated segmentation as implemented in Analyze 10.0. Using published anatomical descriptions of the domestic dog brain, we created a preliminary MRI atlas of the domestic dog and wolf brain. These results are discussed in light of the existing literature on canid behavior and evolution.

♦ 13 ♦

Optimization of a Flow Cytometry-Based Macrophage Engulfment Assay

Nicole Sztuk, DO'17 and Suzanne Bohlson, PhD

Failure to clear apoptotic cells is associated with the development of autoimmune diseases, atherosclerosis and other inflammatory diseases. The goal of this project was to improve current methodology used by the laboratory to investigate macrophage-dependent engulfment of apoptotic cells. We utilized Jurkat cells, a human T-lymphocyte cell line, and mouse bone marrow derived macrophages to investigate engulfment in a flow cytometry based assay. To identify optimal growth and apoptosis-inducing conditions in Jurkat cells, a growth curve was performed in the presence and absence of etoposide, a topoisomerase II inhibitor. Jurkat cells doubled every 24 hours over four days and growth was inhibited in the presence of 10 and 40 μM etoposide. Equivalent apoptosis was observed using 10 or 40 μM etoposide as measured by detection of annexin V. Apoptotic Jurkat cells were labeled with the fluorescent dyes CFSE or pHrodo Green Maleimide (pHrodo). Jurkat cells labeled with pHrodo, a pH-sensistive dye, were observed by fluorescence microscopy under basic, neutral and acidic conditions and as expected, increased fluorescence was observed as the pH was lowered. CFSE or pHrodo labeled Jurkat cells were fed to macrophages and engulfment was detected by flow cytometery. While pHrodo–positive cells were only detected within phagocytes where the pH <7.4, CFSE labeled Jurkats were observed both associated with macrophages and not associated with macrophages. These studies have identified an optimal Jurkat cell growth pattern, etoposide concentration, and labeling technique, each of which serve to improve the efficiency and reliability of the assay system.

♦ 14 ♦

Complement Component C1q Regulates Macrophage Activation

Emily Gonser and Suzanne Bohlson, PhD

The inability to clear apoptotic cells is related to the development of autoimmunity because dead cells serve as a source of auto-antigens to which the body mounts an immune response. Complement component C1q enhances phagocyte clearance of apoptotic cells while dampening inflammation and C1q-deficiency results in development of autoimmunity. The goal of this study was to identify the optimal concentration of C1q required to modulate phagocytosis and apply this information to investigate C1q-dependent regulation of macrophage pro-inflammatory signaling. To identify the optimal concentration of C1q for phagocytosis, mouse bone marrow derived macrophages (BMDM) were added to wells coated with increasing concentrations of C1q, and phagocytosis of antibody-coated particles was assessed by microscopy. Four ug/mL was identified as the optimal dose to elicit a 1.8 fold increase in percent phagocytosis over control BMDM. To assess the contribution of C1q to the regulation of inflammation, BMDM were stimulated with 4 ug/ul C1q and left untreated or polarized to a pro-inflammatory M1 macrophage using lipopolysaccharide, a Toll-like receptor (TLR)-4 agonist and interferon-γ. Pro-inflammatory cytokines TNF-α and IL-6 were measured by ELISA. M1 macrophages stimulated with C1q produced 1.5-4 fold less TNF-α when compared to control macrophages. Similar experiments were performed using CpG, a TLR-9 agonist. These studies indicate that low concentrations of C1q stimulate enhanced macrophage phagocytosis and inhibition of pro-inflammatory cytokine production supporting the hypothesis that C1q-dependent regulation of macrophage activation is important in the maintenance of normal tissue homeostasis.

♦ 15 ♦

Regulation of Autophagy in Rodent Stress Models of Depression

Matt Dalton, Lamija Bashich, Jennifer Giles, MA, Vanja Duric, PhD, Eric Wauson, PhD

Major depressive disorder (MDD) is a common and debilitating mental illness affecting approximately 17% of adults in the United States that is characterized by enhanced sadness, loss of pleasure, and despair. Currently available antidepressant medications are ineffective in approximately one-third of depressed patients and are afflicted with a multitude of side effects. The exact cellular and molecular mechanisms underlying the development and treatment of depression are not well understood, however, recent studies indicate that autophagy may be an important cellular mechanism involved in antidepressant therapeutic actions. Autophagy is a catabolic process that allows for the degradation and recycling of cellular components and is critical to proper physiological function of the cell. In this study, we examined whether autophagy is regulated in rodent stress models of depression, within brain regions involved in regulation of mood. Specifically, we investigated changes in levels of LC3-II and p62 proteins, known markers of autophagy, in animals exposed to chronic stress and/or antidepressant treatment.

♦ 16 ♦

Expression and Purification of UDP-glucose Pyrophosphorylase from *Trichomonas vaginalis*

Alex Davis, DO'17, Michael P. Boyer, BS, Andrew Brittingham, PhD, Wayne A. Wilson, PhD

UDP-glucose pyrophosphorylase converts UTP and glucose-1 phosphate into UDP-glucose and pyrophosphate in a freely reversible reaction. The enzyme plays a key role in glycogen metabolism, supplying UDP-glucose for use in the synthesis of this important storage polysaccharide. The sequenced genome of the parasitic protist *Trichomonas vaginalis* contains two open reading frames, TVAG_102390 and TVAG_388260, which encode putative isoforms of UDP-glucose pyrophosphorylase. We amplified the TVAG_102390 open reading frame from *T. vaginalis* cDNA and cloned it into an *E. coli* expression vector, pET-28a. We determined that expression of the TVAG_102390 open reading frame in *E. coli* resulted in high yields of a soluble protein. The TVAG_102390 protein was purified by immobilized metal affinity chromatography and enzymatic activity was determined under various conditions. We have established that recombinant TVAG_102390 does indeed show measurable activity towards UDP-glucose, confirming its identity as a *bone fide* UDP-glucose pyrophosphorylase. We are currently in the process of cloning and expressing the TVAG_388620 open reading frame. We hope to purify recombinant TVAG_388260 and, ultimately, compare the kinetic properties of the two *T. vaginalis* UDP-glucose pyrophosphorylase enzymes.

♦ 17 ♦

Combination of IL-21 with Radiation Enhances Antitumor Effects in Bladder Cancer Cells: A Novel Role for Cytokines as Potential Radiosensitizers

Matthew R. Davis[1], Qian Bai, Ziwen Zhu[2], Dwayne M. Hansen, DO'17[1], Michael B. Nicholl[2], Yujiang Fang, PhD[2]

[1] Microbiology and Immunology, Des Moines University, Des Moines, IA
[2] Surgery and Ellis Fischel Cancer Center, University of Missouri School of Medicine, Columbia, MO

Background: Bladder cancer (BC) is the second leading cancer of the genitourinary system. Radiation therapy (RT) for BC is an attractive alternative as it allows for normal urinary/sexual functions. However, radiation toxicity remains challenging. A safe and effective radiosensitizing agent is needed to allow a decrease in the radiation dosage. IL-21 is a new cytokine in the IL-2 family of cytokines and its role in immunity has been extensively studied. However, its role as a potential radiosensitizer has not yet been reported. This study was designed to investigate if IL-21 could sensitize BC to RT.

Methods: Clonogenic survival assay, immunohistochemistry, TUNEL staining, and proliferation and caspase-3 activity kits were used to evaluate the effect of RT in combination with IL-21 (RT/IL-21) on cell survival, proliferation and apoptosis of the bladder cancer cell line, T24. We further investigated the possible molecular mechanisms by using RT-PCR, IHC, and Western Blot.

Results: RT/IL-21 additively/synergistically enhanced RT-induced apoptosis and inhibition of T24 cell proliferation. The anti-proliferative effect of RT/IL-21 treatment correlated with increased expression of anti-proliferative molecules p18, p27 and p53. Increased apoptosis correlated with increased expression of the pro-apoptotic molecule TRAIL.

Conclusions: RT/IL-21 improves antitumor activity in BC cells by modulating anti- proliferative and pro-apoptotic molecules. These data highlight the potential of cytokines such as IL-21 as radiation sensitizers for BC.

♦ 18 ♦

IL-33 Promotes Proliferation and Inhibits Apoptosis of Ovarian Cancer Cells

Dwayne M. Hansen, DO'17[1], Matthew R. Davis[1], Ziwen Zhu[2], Chenglu Qin[2], Qian Bai[2], Benton N. Parker[2], Xuhui Chen[1], Michael B. Nicholl[2], Yujiang Fang, PhD[1]

[1] Microbiology and Immunology, Des Moines University, Des Moines, IA
[2] Surgery and Ellis Fischel Cancer Center, University of Missouri School of Medicine, Columbia, MO

Background: Of all cancers that affect the female reproductive system, ovarian cancer causes the most deaths. Understanding what drives or inhibits this cancer will lead to better treatment and prevention. IL-33 is a new member of the IL-1 cytokine family. Its role in the immune response to infectious pathogens and allergens has been extensively studied. However, little data exists regarding its role in tumour proliferation and apoptosis. Previously we showed IL-33 inhibits proliferation and induces apoptosis of pancreatic cancer cells. This study was performed to investigate if IL-33 has any effect on ovarian cancer cells.

Methods: Clonogenic survival assay, immunohistochemistry (IHC), TUNEL staining, proliferation and caspase-3 activity kits were used to evaluate the effects of IL-33 on cell survival, proliferation and apoptosis of an ovarian cancer cell line, A2780. We further investigated the possible molecular mechanisms by using RT-PCR, IHC, and Western blot.

Results: We found that the percentage of colonies of A2780 cells, PCNA+ cells and the OD value of cancer cells were all increased after incubation with IL-33. TUNEL+ cells and the relative caspase-3 activity in cancer cells were decreased in the presence of IL-33. The pro-proliferative effect of IL-33 on cancer cells correlated with downregulation of anti-proliferative molecule p27.The anti-apoptotic effect of IL-33 correlated with downregulation of pro-apoptotic molecule Fas and TRAILR1.

Conclusions: IL-33 promotes proliferation and inhibits apoptosis of ovarian cancer cells by downregulating p27 as well as Fas and TRAILR1. Inhibition of IL-33 pathway might be a promising strategy to treat ovarian cancer.

♦ 19 ♦

Physician Assistant Student Psychological Type Preferences to Inform Academic and Professional Practice

Sarah Gillmore, MHA'20 and Carla Stebbins, PhD

Master of Health Care Administration, Des Moines University, Des Moines, IA

Myers-Briggs personality profiles (MBTI) have been correlated with career choice, learning styles and professional performance. An understanding of these profiles is thus important to guide education and career development. Our goal for this study was to track any changes in Myers-Briggs profiles of incoming students in the physician assistant program over the last seven years at Des Moines University (DMU). First year Physician Assistant students voluntarily completed the Myers-Briggs Type Indicator (MBTI—Form M). This data has been collected since 2007 and analyzed for percentage of students falling into the each of the personality preference categories. Data analysis showed that students entering DMU's physician assistant program from 2007-2012 are predominantly described as ESFJ (Extraverted, Sensing, Feeling, Judging) with a change in 2013 to ISFJ (Introverted, Sensing, Feeling, Judging). From this, we concluded that first year physician assistant students at DMU exhibit a personality profile (SFJ) (Sensing, Feeling, Judging) with variability in the E (Extraverted) or I (Introverted) component. This is different than that reported for physician assistant students at other institutions and practicing physician assistants, which most report as ESTJ (Extraverted, Sensing, Thinking, Judging) and ISTJ (Introverted, Sensing, Thinking, Judging), respectively. Specifically, they differ from all the others in the F/T (Feeling, Thinking) category. However, they all share the SJ (Sensing, Judging) component of the 'guardian' Keirsey temperament sorter.

♦ 20 ♦

Motor Imagery Ability in Persons with Parkinson's Disease: Does Physical and Cognitive Status Matter?

Amelia Dahlhauser and Kristin Lowry, PhD

[1] Biology, Iowa State University, Ames, IA
[2] Doctor of Physical Therapy Program, Des Moines University, Des Moines, IA

Objective: To examine the associations between motor imagery ability, cognition, and physical function in persons with Parkinson's disease (PD).

Background: Motor imagery (MI) refers to imagining an action without actual physical execution. MI practice has been shown to facilitate motor skill learning in healthy groups and persons post stroke, with emerging evidence that MI practice may benefit persons with PD. An important part of determining the clinical value of MI for an individual with PD is to examine characteristics associated with imagery ability.

Methods: Eight individuals with PD participated (mean age = 65 years ± 6). Imagery ability was assessed using both the Kinesthetic and Visual Imagery Questionnaire (KVIQ, max score = 170) and the Movement Imagery Questionnaire - Revised Second version (MIQ-RS, max score = 98). For both imagery questionnaires, higher scores indicate better imagery ability. Cognition was assessed using the Montreal Cognitive Assessment (MoCA, max score = 30, < 26 indicates cognitive impairment), and physical status was assessed using the Hoehn & Yahr (HY) scale (range 0 – 5, 5 = bed ridden). Spearman's rho statistics were used to determine the associations between imagery ability and cognitive and physical status.

Results: The mean HY stage was 2.5, indicating mild to moderate disease. The mean (SD) scores on the assessments were: KVIQ, 123 (25), MIQ-RS, 69 (19), MoCA, 25 (3.7). The correlations between the KVIQ and MIQ-RS with the MoCA were $r_s = 0.837$, $p = 0.010$, and $r_s = 0.732$, $p = 0.039$, respectively. The correlations between the KVIQ and MIQ-RS with the HY scale were $r_s = -0.013$, $p = 0.976$, and $r_s = -0.273$, $p = 0.514$, respectively. There was also a significant association between the language subscale of the MoCA and the KVIQ ($r_s = 0.782$, $p = 0.022$).

Conclusion: These preliminary data suggest that cognitive ability, and not physical ability, is associated with motor imagery ability. Specifically, better cognition is associated with better ability to imagine movement. One explanation for this finding may be that both cognition, as assessed by the MoCA, and motor imagery rely on frontal lobe function. Intact frontal lobe function, more so than actual physical ability, may be important for the effective use of motor imagery.

♦ 21 ♦

Difference in Hip and Pelvis Kinematics Using Two Different ASIS Location Techniques

Dillon Follmuth[1] and Vassilios Vardaxis, PhD[2]

[1] University of Northern Iowa, Cedar Falls, IA
[2] Human Performance Lab, Des Moines University, Des Moines, IA

Background: Traditional models for clinical gait analysis all use the anterior superior iliac spine (ASIS) location to predict the 3 dimensional movements of the hip and pelvis. The importance of having an inaccurate location of the ASIS will affect the hip and pelvis kinematics. This study aimed at determining if skin attached markers or wand predicted ASIS will show a better representation of the hip and pelvis in overweight individuals.

Methods: The 3D motion of the pelvis segment and the hip joint were compared using 2 different ASIS identification techniques: skin attached and wand predicted markers. Forty THA patients and 15 control subjects were assessed during self-selected speed gait using a 3-D motion analysis system.

Results: The methodology of ASIS location had implications on the 3D motion evaluated for the pelvis and hip joint. The least affected outcomes were the hip joint sagittal plane (10.24%), and the pelvis transverse plane (9.91%) motion. The most affected outcomes were the hip transverse plane (30.63%) and the pelvis sagittal plane (148.54%) motion.

Conclusions: Our results so far show that significant attention should be given to the methodology of gait analysis for overweight individuals, and modifications in the traditional models for clinical gait analysis are needed.

♦ 22 ♦

Hip Extensor Strength Reliability and Difference in Prone Position and Prone Standing Position: A Pilot Study

Brian Wanner, DO'17 and Shannon Petersen, PT, DScPT

Background: Accurately measuring hip extensor strength is crucial in determining the impact hip extensors have on functional impairment. A previous study examined hip extensor strength in standing and prone positions with the knee extended. No published studies have compared hip extensor strength in the prone (PP) and prone standing position (PSP) with the knee flexed.

Purpose: To demonstrate the reliability and differences in hip extensor strength in the PP and PSP with the subject's knee flexed.

Methods: 4 females and 4 males were recruited for the study. All subjects had hip extensor strength measured in PP and PSP using a hand-held dynamometer (HHD) with the knee passively flexed past 90 degrees. The order of testing was randomized.

Results: Measuring hip extensor strength with HHD yielded excellent reliability in left prone position (LPP) with an intraclass correlation coefficient (ICC) of .96, excellent reliability in left prone standing position (LPSP) (ICC=.83), excellent reliability in right prone position (RPP) (ICC=.85), and poor reliability was

found in the right prone standing position (RPSP) (ICC=.37). There was significant difference between LPP and LPSP (t<0.01). This test was performed reliably in both positions on the left. No significant difference was found between RPP and RPSP (t=.90).

Conclusion: Reliability results and difference between testing positions are inconclusive. A larger sample size needs to be used to determine the reliability and differences in measuring hip extensor strength in the PP and PSP with the knee flexed.

♦ 23 ♦

The Use of Yoga in Physical Therapy: A Survey of Therapists' Attitudes and Practices in Patient Care

Mary Beth Wims, DPT'17, Laura Covill, DPT, Ann York, PhD

Des Moines University, Des Moines, Iowa

Background/Purpose: Yoga is a health-promoting movement activity that incorporates breathing, concentration, sensory awareness, and meditation. Since the specific poses and breath awareness of yoga dovetail with physical therapy's roots in movement and alignment, the intersection of yoga and physical therapy is a natural one. Presently, yoga's use in physical therapy is unknown. The purpose of this research is to determine if and how yoga may currently be used in the field of physical therapy.

Methods: Our poster will outline the process of identifying a project focus and research questions, designing a survey to address our questions, and submitting to the Des Moines University Institutional Review Board (IRB).

Results: Survey questions will elicit therapists' exposure to yoga, if and why they use yoga in patient care, and their beliefs about yoga's effects. Participants (n=1000) will be randomly selected physical therapists from the American Physical Therapy Association's membership.

Future Directions: Upon IRB approval, the survey instrument will be distributed to participants. Data will be collected and analyzed.

♦ 24 ♦

Assessment of Gait After 1st Metatarsalphalangel Joint (MTPJ) Fusion

Nathan Shumway, DPM'16, Paul Dayton, DPM, MS, David Burt, DPM'16, Mindi Feilmeier, DPM

Des Moines University, Des Moines, IA

A first metatarsophalangeal joint (MTPJ) fusion is a fusion between the head of the first metatarsal and the base of the first proximal phalanx. We believe that first MTPJ fusion for pathologies such as a Hallux Abducto Varus or Hallux Limitus yields equal to or better results than alternative treatments and allows for a quick recovery time without the need for later revision. Currently, some surgeon feel that a first MTPJ fusion should only be used in severe cases of the previously mentioned pathologies, as well as cases of severe arthritis and revision of other procedure. There is concern by some surgeons that a patient with a first MTPJ fusion will have functional gait derangement postoperatively. There is a limited amount of studies published on the impact of the first MTPJ fusion on gait, therefore, our purpose is to answer the question on how an MTPJ fusion may impact gait including cadence, step length, stride length, base of support, step time, stride time, swing time, stance time, single support time and double support time. We will answer this question using the GAITRiteTM walking assessment system. A number of patients from the DMU and Unity Point Foot and Ankle Clinic in Fort Dodge who have received a first MTPJ fusion will participate in this research. Through a series of walks on the GAITRite walking assessment system we should be able to confidently show the validity of this procedure.

♦ 25 ♦

Using the Wellness Recovery Action Plan (WRAP)® Within the International Clubhouse Model to Improve Wellness

Laurel Whitis, DO'17, Carolyn Beverly, MD, MPH, Gretchen Tighe, MPAS, PA-C, Muhammad Spocter, PhD

Des Moines University, Des Moines, IA

Americans spend 317.6 billion dollars a year on mental illness, according to the most recent statistics. Lost earnings due to disability account for over half of this sum. This problem is made worse by a shortage of preventive services and psychiatric care. A wellness program focused on self-management of psychiatric symptoms could be an effective replacement for difficult-to-find mental health services and reduce the number and length of psychiatric hospitalizations. We are examining how the use of the Wellness Recovery Action Plan (WRAP®), at a Clubhouse International-accredited house called Passageway, influences participant wellness. The participants' pretest results demonstrated poor utilization of mental health self-management skills – for example, having an action plan for returning to a state of wellness when symptoms worsen. Our hypothesis is that the same survey, delivered after completion of the course, will demonstrate that participants have learned how to identify triggers, understand when their illness is becoming more severe, and to implement a plan to keep themselves safe when they are most symptomatic. Additionally, we hypothesize that participants' overall sense of wellness will be increased after completing the WRAP®.

♦ 26 ♦

Micro-Populations© in Central Iowa and Implications for Public Health: Part III-Community Perspective

Gianni Beer and Pamela A. Duffy, PhD

This study is part three of a three part research study to assess health care access for immigrants and refugees in Dallas County, IA.

This study has three primary goals:

1) To gain understanding of the perspective of community leaders regarding the adequacy of access to public health and health care services for immigrants and refugees in Dallas County, IA
2) To assess some structural barriers to health and wellness for immigrants and refugees in Perry, Dallas County, IA.

The study uses mixed methods including qualitative methods consisting of semi-structured interviews. The quantitative portion of the research design used SurveyMonkey® for email distribution of a structured survey to community leaders, service providers, educators, government employees, policymakers, and advocates regarding factors that affect health in general, funding of community health initiatives, and anticipated health care access issues. In addition, the survey was mailed to those in the target participant groups without an identifiable email address. To achieve a broader community distribution, the survey was handed out to volunteer participants at a local grocery store in Perry, IA on two ½ days. The preliminary results of the survey indicate that refugees who work in Perry, IA receive the majority of their health care services in the city in which they live rather than Perry, IA. In addition, some primary care providers do not practice in Perry, IA itself and immigrants living in Perry, IA must drive 40-50 miles to receive services from pediatricians for example.

Information Avoidance in Real Versus Hypothetical Conditions

Christian Pearson, DO'17, Sivan Ben-David, DO'17, Rachel Reimer, PhD

Background: Information avoidance is the choice to either temporarily or permanently avoid unwanted information. Information is often avoided when it a) is inconsistent with existing belief patterns b) may require an undesired change in behavior c) causes unpleasant emotions. Genetic tests are often used in research designed to understand factors associated with health information avoidance. The option to have a genetic test is often presented to participants as a hypothetical ("would you" get this test) question. Because the decision to obtain preventive and personally relevant information is critical to preventive medicine and public health, there is a need to identify factors associated with information avoidance in a "real-life", ecologically valid setting.

Objective: To identify factors associated with information avoidance for hypothetical and "real" genetic testing.

Methods: One hundred twenty five adult participants will be randomly assigned to one of two conditions: a hypothetical or real information condition. All participants will present to a clinical environment, be given information about breast/prostate cancer, fill out a questionnaire that includes a variety of psychosocial measures, and offered a genetic test for susceptibility to breast/prostate cancer in one of two ways. The hypothetical group will be asked "If you were offered this test, would you receive it?" and the real group will be asked "This test is available now, would you like to have the test conducted now?" Participants in the "real" condition will provide a check swab for their genetic test.

Results: Data from the proposed study will provide valuable data regarding factors associated with uptake rates of genetic tests in hypothetical scenarios versus clinical settings.