

David McDonagh	Anesthesiology and Pain Management	Correlating angiographic vessel caliber with transcranial Doppler flow velocities in patients with subarachnoid hemorrhage	Cerebral vasospasm is the leading cause of disability and death in patients who experience a subarachnoid hemorrhage. Currently, the gold standard for diagnosis is cerebral angiogram or computed tomography angiogram. These tools have a high specificity and sensitivity; however, they are invasive, expensive, and expose patients to radiation. Transcranial Doppler ultrasonography is another tool used to screen and diagnose for cerebral vasospasm. It is non-invasive, inexpensive, and does not expose patients to radiation. This test is controversial over its use as a diagnostic tool as its sensitivity varies depending on the artery that is measured, but it is commonly used to screen patients for vasospasm. This study is designed to compare blood vessel diameters with corresponding velocities. Eventually we plan on stratifying patients into risk categories based on the velocities of different measured vessels.
Tiffany Moon	Anesthesiology and Pain Management	Cocaine Use and General Anesthesia: A Prospective Study of Cardiovascular and Anesthetic Effects	Hypothesis: We plan to enroll 300 patients in order to prove 1) cocaine patients have no increased risk of adverse events, 2) cocaine patients have no increased levels of CRP and troponin, and 3) cocaine patients do not need higher amounts of anesthesia to maintain adequate depth of anesthesia.
Tiffany Moon	Anesthesiology and Pain Management	Incidence of Postoperative Neuromuscular Blockade in the Post Anesthesia Care Unit at Parkland Hospital: Does Size Matter?	Primary Hypothesis: The incidence of postoperative residual neuromuscular blockade in patients in Parkland PACU will be about 20%. Secondary Hypothesis: Obese and morbidly obese patients will have a greater incidence of postoperative residual NMB compared to lean patients.
Carole Mendelson	Biochemistry and Ob-Gyn	Role of Vitamin D Metabolism in the Timing of Birth	To identify novel genes that maintain uterine quiescence during pregnancy and promote the initiation of term and preterm labor, our lab conducted RNA-seq analysis of poly(A) ⁺ RNA from myometrium of timed-pregnant mice at 15.5 - 18.5 days post-coitum (dpc) and during labor (19.0 dpc). Intriguingly, one of the most highly downregulated transcripts at 18.5 dpc and in-labor, compared to 15.5 dpc, was Cyp27b1, which was decreased by ~70% at 18.5 dpc and by 95% during labor, as compared to 15.5 dpc. Cyp27b1 encodes 1-hydroxylase, the key enzyme in synthesis of the

			<p>active form of vitamin D, 1,25-dihydroxyvitamin D3 (1,25(OH)2D3), which binds to the vitamin D receptor (VDR), a member of the steroid receptor family. In the same series of samples, VDR expression was decreased by 25% during labor, compared to 15.5 dpc.</p> <p>Moreover, vitamin D deficiency and VDR polymorphisms have been linked to spontaneous PTB. During pregnancy, T cells express VDR; 1,25(OH)2D3 was found to suppress proinflammatory T effector cells, and to promote expansion of regulatory T cells (Treg), which protect the fetus from maternal rejection.</p> <p>Hypotheses: Based on these collective findings, as well as the pronounced decline in Cyp27b1 expression in mouse myometrium during late gestation and in labor, we postulate that Cyp27b1 and VDR are key P4/PR target genes in the pregnant myometrium that act cooperatively with P4/PR to maintain myometrial quiescence. Further, the decline in PR function near term results in decreased Cyp27b1/VDR, which contributes to increased myometrial contractility leading to labor. We also hypothesize that 1,25(OH)2D3 may provide a safe and effective treatment for prevention of PTB..</p>
Luke Rice	Biophysics	Structure, Function, and Biochemistry of ChTOG, ZYG9, and XMAP215 TOG Domains	<p>The aim was to express, purify, and study the tubulin binding patterns of the ChTOG TOG5, XMAP215 TOG5, and ZYG9 TOG3. ZYG9 TOG3 is homologous to vertebrate TOG5 domains expected to eliminate tubulin binding). ZYG9 TOG3 were successfully purified. The cosedimentation data indicates that ZYG9 TOG3 does not bind to GMPCPP stabilized vertebrate microtubules. Future direction includes more binding assays to test the affinity of ZYG9 TOG3 and its mutants to unpolymerized and polymerized vertebrate tubulin.</p>
Mark Drazner	Cardiology	Association of Genetic Markers of African Ancestry with Electrocardiographic Voltage and Cardiac Magnetic Resonance Left Ventricular Hypertrophy: the Dallas Heart Study	<p>Background and Objective: African Americans compared to whites have increased electrocardiographic (EKG) voltage and left ventricular hypertrophy (LVH) as assessed by cardiac magnetic resonance (CMR). It is uncertain whether these ethnic differences have a genetic basis. Our study aimed to determine whether African ancestry was associated with left ventricular (LV) mass and EKG voltage in the Dallas Heart Study.</p>

Qi Fu	Cardiology	Changes in Endothelial Function in Pregnancy at High Risk vs Average Risk for Hypertensive Disorders	Hypertension disorders (including GH, GD, PE and HELLP Syndrome) are a leading cause of maternal worldwide morbidity and mortality. Despite the prevalence of these disorders, very little is understood about the mechanism of these disorders. During the time course of pregnancy, many physiological changes occur in a rapid amount of time, and past literature suggests that these changes are different in pregnancies afflicted by hypertensive disorders. Therefore, the purpose of this project is to investigate the pregnancy time course changes on endothelial function for high vs average risk for hypertensive disorders. For this study, high risk is defined as a family or past medical history of a hypertensive disorder during pregnancy. The hypothesis is that endothelial function will be decreased in patients that are at high risk for hypertensive disorders..
Kemp Kernstine	Cardiovascular and Thoracic Surgery	Study of Empyema Diagnosis, Management, and Outcomes (SEDMO) at UT Southwestern Medical Center: January 1, 2006 to June 30, 2017	Objective: The standards of care for the management of parapneumonic empyema at UT Southwestern are inconsistent, and evidence-based guidelines are necessary for the improving care.
Marc Diamond	Center for Alzheimer's and Neurodegenerative Diseases	Discovery of Small-Molecule Inhibitors of Tau Uptake	Background: A large portion of neurodegenerative diseases are characterized by insoluble protein accumulations impeding normal neuronal function (2,3). We investigated the effect of NDST1 inhibition on tau uptake using a twofold approach: 1) through genetic inhibition of the n-deacetylase and n-sulfotransferase domains of NDST1, and 2) through peptide-mediated inhibition of the sulfotransferase domain of NDST1. Objective: To determine if genetic and/or small molecule inhibition of the n-deacetylase or n-sulfotransferase domains of NDST1 is sufficient for inhibition of tau uptake.
Prashant Mishra	Children's Research Institute	Inhibition of the xCT transporter in mice as a treatment for mitochondrial myopathy	Background: Mutations and deletions in the mitochondrial genome are known to cause myopathies in humans at a rate of approximately 1:5000 newborns, and currently no effective treatment options are available. In mitochondrial myopathies, muscle fibers alter the expression of solute carrier (SLC) family members, including xCT, a transporter that exports glutamate and

			imports cystine. We hypothesize that inhibiting xCT will prevent glutamate wasting in myofibers and rescue the poor muscle function and altered metabolism seen in mitochondrial myopathies.
Woo-Ping Ge	Children's Research Institute	Vascular and Neurofiber Patterns in MSC Glioma	Hypothesis: Glioma cells alter the neurovasculature and neurofiber organization, leading to epileptic activity in adjacent neurons. Objectives/Aims: Immunostain mouse brain slices (xenografted with G5 glioma) and use confocal microscope to examine the relationship between glioma cells and the patterns of adjacent vasculature and neurofibers.
Mentor	Department	Project Title	Summary/Hypothesis
David Gerber	Department of Clinical Science	Prevalence and prognostic impact of prior cancer diagnoses for multiple cancer types	In oncology clinical trials, the assumption that a prior cancer diagnosis could interfere with study conduct or outcomes results in frequent exclusion of such patients. We determined the prevalence and characteristics of this practice in breast and gastrointestinal (GI) cancer clinical trials and estimated impact on trial accrual.
Mohamed Guenena	Department of Ophthalmology	Acanthamoeba keratitis in residents' clinic compared to faculty private practice	Background: Acanthamoeba keratitis is a devastating infection of the eye. Although it rarely occurs - with an estimated incidence of .00001-.0002% in contact lens wearers - it frequently occurs in relatively significant outbreaks, raising the importance of prevention. Purpose: The purpose of this study is to review the clinical presentations and management of Acanthamoeba keratitis in Parkland County Hospital and to compare it to Aston Clinic, a faculty private practice.
Amit Pandya	Dermatology	NBUVB Phototherapy Doses Based on Fitzpatrick Skin Type and Ethnicity in Patients with Vitiligo	Vitiligo is an autoimmune skin disorder in which CD8+ T cells destroy melanocytes in the basal layer of the epidermis leading to patchy depigmentation of the skin. Vitiligo is not uncommon - it affects 0.5-2% of the world's population. Our aim was to stratify patients based on their ethnicity and skin type and document their minimal erythema dose. In regards to skin types, we predicted that patients with darker skin types ranging from 4-6 would have higher minimal erythema doses than patients with lighter skin types ranging from 1-3. In regards to ethnicities, we predicted that African American patients would have higher minimal erythema doses than would Caucasian and Hispanic patients. Most patients have home units as they are more convenient, but some patients

			come to our clinic at UT Southwestern to receive their phototherapy treatment.
Amit Pandya	Dermatology	Validation of Vitiligo Noticeability Scale (VNS): A Patient-Reported Outcome Measure of Vitiligo Treatment	In 2016, the first patient-centered outcome measure to measure repigmentation percentage after vitiligo treatment, also known as the Vitiligo Noticeability Scale (VNS) were published. In the original validation study, Dr. Batchelor et al created 39 pairs of 'before' and 'after' treatment images, 35 of which were created on Adobe Photoshop. These images included only images on the face and the hands because these locations were considered to be 'high visibility' locations. In our study, we sought to validate the VNS using patients' own images on lesions both in areas of high as well as low visibility. Our hypothesis was that patient-performed assessment of vitiligo lesions using the VNS correlates to clinician-performed assessment (using percent repigmentation and global treatment success) of the same lesion.
Ben Chong	Dermatology	Determining the Cellular Sources of CXCL9 and CXCL10 in Cutaneous Lupus Erythematosus	Hypothesis The aim of this project is to characterize and compare expression of CXCL9 and CXCL10 in multiple skin cell subsets including CD20+ B cells, CD3+T cells, CD68+/CD163+ macrophages, CD123+ plasmacytoid dendritic cells (pDCs), and basal keratinocytes in cutaneous lupus erythematosus (CLE) lesional skin. We hypothesize that basal keratinocytes, CD68+ macrophages, and CD123+ pDCs express higher levels of CXCL9 and CXCL10 in CLE than other cells.
Donald Glass	Dermatology	Quantification of PPAR- γ target gene expression in keloid and normal skin	Background Keloids are exuberant scars extending beyond the borders of the original skin injury, causing pain, pruritus and psychosocial effects when they appear. In keloids, activation of the peroxisome proliferator-activated receptor (PPAR)- γ reduces mRNA expression of transforming growth factor- β 1 (TGF- β 1), Collagen I, and fibronectin, resulting in beneficial outcomes in the treatment of organ fibrosis. As the PPAR- γ pathway is able to inhibit TGF- β 1, it suggests that a decrease in PPAR- γ signaling and upregulation of its normally inhibited downstream products may be a mechanism of keloid formation. Objective We hypothesize that mRNA and protein expression of PPAR- γ target genes will be dysregulated in keloid samples compared to normal controls obtained from the same patient.

Donald Glass	Dermatology	PDE1A Gene Expression is Upregulated in Keloids	<p>Keloids are abnormal proliferation of scar tissue that occur in response to cutaneous wound healing and grow invasively beyond the borders of the original wound as a result of increased fibroblast proliferation and collagen synthesis. Besides being cosmetically disfiguring, keloids can be both painful and pruritic, affecting patients' quality of life. The treatments that are currently used for keloids are usually inconvenient and only partially effective. Finding the genes that are upregulated in keloids can give us potential therapeutic targets for the future. There is evidence that pentoxifylline, a phosphodiesterase inhibitor, reduces keloid symptoms. This suggests that phosphodiesterase enzymes (PDEs) may be upregulated in keloids. RNA microarray analysis of fibroblasts from keloids and normal scars shows elevated levels of PDE1A in keloid fibroblasts. However, these microarray results were not confirmed by Northern blot or RT-PCR. Hypothesis: Hypothesis 1: PDE1A expression is increased in keloid tissue compared to normal skin tissue. Hypothesis 2: PDE1A expression is increased in keloid fibroblast compared to normal skin fibroblast</p>
Tamia Harris-Tryon	Dermatology / Immunology	Hyperplasia and Hypertrophy of Adipose in Response to Bacterial Colonization	<p>In the world of cutaneous immunity, lipids have been shown to have an antimicrobial effect (Drake, 2007; Feingold, 2009; Fischer, 2014). Of particular interest to us is how the dermal white adipose layer of the skin can be affected by bacterial colonization due to the interaction between the bacteria and the cutaneous immune system. Zhang et al. (2015) showed that mice infected with <i>Staphylococcus aureus</i> demonstrated a rapid proliferation of their dermal fat layer. And in our lab, we observed that conventional mice (fully colonized by the microbiota) have grossly more opaque skin in comparison to the skin of mice in our germ-free facility that are not exposed to the microbiota. Using histological analysis we compared the dermal white adipose layer between these two groups and showed that germ free mice skin have less dermal white adipose than conventional mouse skin. Objective: This project aims to quantify the above-mentioned observed difference in dermal white adipose tissue between germ-free and conventional mice, and to explore the mechanism of this fat expansion in mice colonized by bacteria.</p>

Ava Pierce	Emergency Medicine	Patient Reported Pain Severity vs Provider Perception across Race and Ethnicity	Developing an understanding of the racial disparities in healthcare is necessary to provide culturally competent and appropriate care for persons of all races and ethnicities. Pain is both a universal and individually unique human experience that provides an opportunity to explore differences across various racial and ethnic groups. This study focuses on discovering potential racial and ethnic disparities in the reporting of pain severity by emergency room patients and the perception of patient pain by emergency physicians and nurses. The goal is to compare pain ratings across race and ethnicity to assess potential differences in pain reporting, and to compare pain perception ratings by providers to assess potential provider bias.
Jeff Van Dermark	Emergency Medicine	Educational Implications of the Emergency Medicine Residency Interview Process	Emergency Medicine (EM) residency interviews are important, yet possibly impact the educational choices and experiences for applicants. This study sought to determine if applicants could accurately predict the time burden of the interview season. We also sought to ascertain if the predicted time burden influenced educational decisions by the senior medical students. Finally, we reviewed decisions on interview time burdens by senior medical students and their causes.
Ray Fowler	Emergency Medicine	Clarification of the utility of waveform capnography in the termination of out-of-hospital cardiac arrest (OHCA) resuscitation efforts	Waveform capnography, otherwise called end-tidal carbon dioxide (EtCO ₂) is a unique tool for evaluating patient metabolism, circulation, and ventilation. In this study, the authors hypothesized that the absolute level of measured waveform capnography may be a confounding variable during the decision to terminate resuscitative efforts in OHCA patients, especially in the setting of the administration of sodium bicarbonate (SB). It was determined that a study should be carried out on patients with OHCA on whom TOR occurred to determine the relationship of EtCO ₂ on patients who had and had not received SB during resuscitation. This effort could help clarify the utility of EtCO ₂ on patients who undergo TOR.
Ron Mitchell	ENT	OSA Demographics in Children Under 3 Years	Pediatric obstructive sleep apnea (OSA) is characterized by obstruction of the upper airway during sleep leading to inadequate ventilation. There are serious health consequences of OSA in children if left untreated including attention problems, a reduced quality of life, increased sympathetic tone and cardiovascular abnormalities. Current literature for defining OSA severity has

			<p>predominantly focused on the pediatric population above the age of 3, even though children under 3 may also have OSA. The primary objective of this study was to evaluate the demographics, comorbidities, and polysomnographic characteristics of children under 3 years old. The secondary outcome was to identify predictors of severe OSA in children under 3 who are at a high risk for T&A complications. We hypothesized that many predictors in older children will also pervade this younger population, such as age, gender, BMI z-score (specifically weight increase), and ethnicity. However, we also predict that anatomical and physiologic changes in children less than 3 years old will also affect the severity of OSA, and possibly the risk factors for T&A complications.</p>
Nora Gimpel	Family & Community Medicine	Assessing Laboratory Values in Transgender Women Treated with Hormone Replacement Therapy	<p>Objective: This study seeks to evaluate the response of common laboratory tests to hormone replacement therapy (HRT) in transgender women (MTF) by quantifying the extent of the changes and describing when the changes occur during their treatment. Next steps include completing our current analyses, examining how treatment at these clinics accord to endocrine guidelines, examining the prevalence of medical diagnoses and use of medications in this patient population, determining the effect of noncompliance with the HRT regimen, and planning future prospective studies that will be able to control more variables and add new data describing variables like progression of feminization and patient satisfaction.</p>
Rolf Brekken	Hamon Center for Therapeutic Oncology Research	TBK1 Loss Leads to Changes in Epithelial Plasticity	<p>Pancreatic ductal adenocarcinoma (PDA) is an aggressive cancer and the third leading cause of cancer deaths in the US. Mutations in the gene for KRAS are present in 90% of PDA cases. However, therapeutic efforts to directly target KRAS have been largely unsuccessful. Therefore, many researchers are investigating the downstream targets of KRAS in an effort to indirectly treat KRAS. To further investigate whether TBK1 is central to EMT, we cultured mutant and wild-type (non-mutant) mouse cell lines and examined their morphology upon EMT stimulation.</p>
Ayesha Zia	Hematology	Reduced Physical Activity Level and Cardiorespiratory Fitness	<p>Venous thromboembolism (VTE), a disease that includes both deep venous thrombosis (DVT) and pulmonary embolism (PE), has reached epidemic proportions.. Given that post-thrombotic</p>

		in Children after Acute Venous Thromboembolism	sequelae develop despite effective anticoagulation, it is apparent that pharmacology alone is insufficient to eradicate post-VTE disease. Early identification of VTE consequences may offer an opportunity for effective intervention and reduction of long-term morbidity. Hypothesis: Our overarching hypothesis is that physical activity in children with VTE is likely to be decreased in the post-VTE period, when compared to baseline. We propose that an activity regimen post-VTE is likely to be beneficial and needs to be studied. Therefore, as an important first step, we sought to: (1) assess self-reported physical activity levels in children 6 month post-VTE and change over time from acute diagnosis, (2) compare activity levels of patients with and without adverse post-VTE sequelae, and (3) determine predictors of activity limitations after VTE and assess its association with health related quality of life (HRQoL).
Andrew Koh	Heme/onc	Identifying Predictive Biomarkers for Invasive Bacterial Infections in Stem Cell Transplant and Leukemia Patients	Background and Hypothesis Invasive microbial infections remain a major cause of morbidity and mortality in cancer patients(1-3). The gut is the source for many of the most serious bacterial and fungal infections in these patients(2, 4, 5), what we will now refer to as enteric-derived bloodstream infections, eBSI. There are no reliable biomarkers that can help determine which patients are at higher risk for developing these infections. Three host defense mechanisms are critical for preventing eBSI: 1) gut microbiota homeostasis: abundance of commensal anaerobes and paucity of pathogenic microbes; 2) intact and functioning gut epithelium; and 3) intact cellular immunity, particularly neutrophils(6-8). Following cancer or stem cell transplant (SCT) therapy, all patients become severely neutropenic. To test this hypothesis, we will determine if specific changes in gut microbiota populations predict the development of invasive microbial infections pediatric cancer patients.
Nicolai van Oers	Immunology	Identifying the Mechanism of Novel Compound Heterozygous FOXP1 Mutations on Immunodeficiency	Background- The FOXP1 transcription factor plays a crucial role in thymus development. Mutations in FOXP1 have been shown to lead to severe T-cell immunodeficiency as well as alopecia and nail dystrophy in mice and humans. Recently, three T-cell immunodeficient patients have been identified with FOXP1 mutations. However, each patient has a different, novel compound

			heterozygous mutation in FOX1 and do not present with either alopecia or nail dystrophy. Because of the compound heterozygous nature of the mutations, we hypothesize that FOXN1 normally functions as a dimer and that these mutations impair the ability of FOXN1 to dimerize, leading to a loss of transcriptional activation and consequently thymus development. It is possible that these mutations have an effect on the 3-D structure of Foxn1 or have introduced a premature stop codon that may lead to a truncation, especially in the case of the frameshift mutation in the four-nucleotide repeat. Here, we summarize our findings for two patients' mutations: a single nucleotide substitution of adenine for thymine at position 1924 (1924T/A) and a similar substitution of adenine for thymine at position 1940 (1940T/A) in Patient 1; in Patient 2, a four-nucleotide repeat at position 933 (933dup) and a 15-nucleotide deletion at position 1089 (1089del).
Mamta Jain	Infectious Disease	Retrospective Database on HCV Associated Lymphomas	Background: Over 180 million people worldwide are chronically infected with Hepatitis C Virus (HCV). Chronic HCV is a major cause of liver cirrhosis and its sequelae such as hepatocellular carcinoma. Beyond its main reservoir in hepatocytes of the liver, clinical data supports the association between HCV and Non-Hodgkin's lymphoma (NHL). Hypothesis: We hypothesize that patients receiving chemotherapy for their Hepatitis C related Lymphoma's would have progression of their liver disease that does not resolve after treatment relative to patients not receiving chemotherapy.
Benjamin Levine	Institute for Exercise and Environmental Medicine	Safe and Effective Countermeasures to Reduce Intracranial Pressure and Ameliorate Visual Impairment in Astronauts. The STOP-VIIP-Study	Astronauts are returning from space with visual impairment that is likely due to the absence of circadian variability in intracranial pressure (ICP) present on Earth. It has been shown that ICP in microgravity is elevated above the 24-hour average value of ICP on Earth. The objective of this study is to provide novel data about the efficacy of lower body negative pressure (LBNP) to mimic daily upright posture by intermittently lowering directly measured ICP while in simulated microgravity (head-down tilt bedrest). We hypothesize that repeated administration of LBNP for 8 hours every day would restore effective circadian variability in ICP and prevent any structural changes in the brain and eye induced by simulated microgravity.

Linda Feagins	Internal Medicine	The effect of Anti-TNF therapy on Cancer Prognosis	Tumor necrosis factor (TNF) inhibitors are considered contraindicated in patients with a history of malignancy within 5 years prior to receiving the treatment due to a concern for increasing the risk of recurrence. However, data to support this notion is limited. Moreover, in practice, patients are often treated with TNF inhibitors despite their malignancy due to poor quality of life if these agents are held. Objective We hypothesize TNF inhibitors can be used safely in patients with chronic inflammatory diseases, like IBD, who have concomitant malignancy or develop malignancy while on these agents.
Rana Gupta	Internal Medicine	Unlocking the Thermogenic Capacity of Human White Adipocytes to Combat Obesity and Metabolic Disease	Adipocytes are regulators of energy and glucose homeostasis in mammals. Excess energy is stored in the form of triglycerides in white adipocytes, which expand to meet increased demand for storage. In obesity, this expansion can become pathologic and lead to diabetes and cardiovascular disease. These chronic metabolic disorders are triggered, at least in part, through alterations in adipokine levels, stimulation of systemic inflammation, dyslipidemia, and mechanical/structural stress on the heart To explore the potential interactions of pharmaceutical compounds and other chemicals with Zfp423 in activation of thermogenic genes in adipocytes, we sought to create a Luciferase gene reporter assay that can be used to test the ability of drugs in inducing or inactivating the beige adipocyte gene program. We hypothesize that Zfp423 inactivation in human white adipocytes will result in increased thermogenic gene program activation and white to beige adipocyte reprogramming. We hypothesize that co-transfection of Ebf2, PPary, and RXRa will result in increased luminescence in NIH3T3 cells with Prdm16 containing luciferase reporter.
Sonia Garg	Internal Medicine - Cardiology	Antibody-Mediated Rejection in Cardiac Transplant Patients at UT Southwestern	Objective: The purpose of this study was to determine if there is a correlation between the amount of complement found in AMR biopsy specimens and the presence of allograft dysfunction.
Zhi-Ping Liu	Internal Medicine &Molecular Biology	Targeting JMJD1A, a histone lysine demethylase, for cardiac fibrosis.	Despite advancements in modern medicine, heart disease remains one of the leading causes of death worldwide. Damage to the heart results in the replacement of cardiac muscle with fibrotic scar tissue, which can eventually lead to pathological remodeling and

			heart failure. Our lab previously identified a histone demethylase, a protein involved in regulation of gene expression within the cell, known as KDM3A (aka JMJD1A) important to the process of hypertrophic remodeling and fibrosis, and developed a small molecule inhibitor of the enzyme called JIB04. This project sought to identify potential gene targets of KDM3A and evaluate both the on- and off-target effects of drug inhibition of KDM3A in a mouse model.
Anand Rohatgi	Internal Medicine, Division of Cardiology	Exploring HDL function and composition in a large multi-ethnic base study population	Background- Cholesterol efflux capacity has been shown in clinical studies to be inversely correlated with prevalent coronary disease and incident of cardiovascular events, but it is still unclear what biological determinants or clinical variables drive cholesterol efflux capacity. Objective To determine the biological, clinical, and metabolic variables that associate with cholesterol efflux capacity measured with two different methods in a multi-ethnic population study (Dallas Heart Study-2). To determine how the measurements of cholesterol efflux capacity and its determinants differ by sex, race, history of diabetes, and history of cardiovascular disease.
David Greenberg	Internal Medicine, Infectious Disease	Thermal Mitigation of Planktonic Bacteria	We are developing a novel non-invasive thermal technique to destroy biofilm on the metal surfaces of prosthetic joints using alternating magnetic fields (AMF), and a fundamental design step is to determine the thermal sensitivity of bacteria strains which commonly colonize prosthetic implants, such as Pseudomonas aeruginosa. Hypothesis: When planktonic bacteria are exposed to constant temperatures above normal physiological range, survival will decline over time at an exponential rate. When antibiotics are used in conjunction with heat treatments, there will be a synergistic bactericidal effect.
David Greenberg	Internal Medicine, Microbiology	Synergy of Antibiotics and PPMOs in the Breakdown of Pseudomonas aeruginosa biofilms	Background: Pseudomonas aeruginosa is an opportunistic Gram-negative bacterium and one of the most common causes of hospital-acquired infection, especially in immunocompromised patients. It is particularly pathogenic because of its ability to form biofilm, which makes it more resistant to clearance by host defenses and antibiotic therapies. Combination therapies have proven to be more effective at clearing biofilms, sometimes because they target different processes in the cell and sometimes

			<p>because they target different subpopulations of cells within the biofilm. Objective: In general, we hypothesized that PPMOs targeting essential genes will be synergistic in their ability to breakdown existing biofilm. In particular, we hypothesized that synergistic effects would be enhanced when the tested PPMO and antibiotic had the same molecular target. Based on previous work, we also hypothesized that PPMOs with 3'RXR4 peptides would be more effective in breaking down biofilms than their 5'RXR4 counterparts, perhaps due to their orientation with respect to the Shine Dalgarno sequence or other yet to be determined mechanism.</p>
Dorothy Sendelbach	Medical Education	The Effects of a Question Bank on Medical Students' Performance	<p>Background: Many medical schools have adopted the pass/fail curriculum for their pre-clinical years. This transition has given students more leniency in terms of grades during their pre-clinical years. However, research suggests the importance of students' performance during their pre-clinical years because it translates to their STEP1 scores (Zhang 2004). Hypothesis: The study question is whether lower performing students will experience a disproportionately larger benefit from use of a well-designed question bank, compared to the median of the class pre and post introduction of the question bank. Also, would fourth quartile students disproportionately benefit from use of the question bank compared to other students?</p>
Joshua Mendell	Molecular Biology	The role of noncoding RNA NORAD in mitochondrial function and aging	<p>Recently, the Mendell laboratory characterized a novel lncRNA that is induced by DNA damage, called NORAD (non-coding RNA activated by DNA damage). We hypothesize that lncRNA NORAD plays a role in aging by helping maintain mitochondrial respiration and redox metabolism. The goal of this project will be to first confirm the mitochondrial defect in human and mouse NORAD^{-/-} cells and elucidate a mechanism by which NORAD deficiency leads to mitochondrial dysfunction and accelerated aging.</p>
Murat Durakoglugil	Molecular Genetics	Molecular basis of Synaptic Suppression of	<p>Alzheimer's disease (AD), a progressive neurodegenerative disease, affects 1 in 9 people over the age of 65. A major genetic risk factor for late-onset AD is the ϵ4 isoform of apolipoprotein E (ApoE4),</p>

		<p>Apolipoprotein E in Alzheimer's Disease</p>	<p>present in almost 20% of the population and has a prevalence of up to 80% in AD patients. Amyloid beta, the toxic protein which accumulates in AD patients, induces synaptic depression, using group 1 metabotropic glutamate receptor (mGluR) dependent-pathways besides many others. DHPG (3,5-dihydroxyphenyglycine), an agonist of mGluRs induces long lasting synaptic depression like amyloid beta. One of the effects of DHPG is the reduction of expression of FMRP (fragile X mental retardation protein). FMRP causes translational repression of Plasticity Related Proteins (PRPs) such as STEP (STriatal Enriched Phosphatase). STEP mediates the endocytosis of glutaminergic AMPA and NMDA receptors, contributing to the reduction in synaptic signaling. Reelin is a neuromodulator which binds to ApoE receptors and can block amyloid beta induced synaptic depression. So far, the effects of Reelin and ApoE isoforms on mGluR dependent LTD is not studied. We hypothesize that Reelin, by inducing expression of FMRP, inhibits STEP expression whereas DHPG does the reverse, thus inducing STEP expression. ApoE4 leads to cognitive impairment and AD development through disruption of the inhibitory effects of Reelin on mGluR LTD. We also hypothesize that without Reelin regulation which happens in the presence of ApoE4, the levels of STEP will increase. Our aim is to determine the effect of ApoE isoforms on STEP activity.</p>
<p>Russell Debose-Boyd</p>	<p>Molecular Genetics</p>	<p>Feedback Regulation of HMG-CoA Reductase in Livers of Mice</p>	<p>Introduction: 3-Hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase (HMGCR) is a membrane-bound protein of the endoplasmic reticulum (ER) that catalyzes reduction of HMG-CoA to mevalonate, a rate-limiting step in synthesis of cholesterol and nonsterol isoprenoids including farnesyl pyrophosphate (FPP) and geranylgeranyl pyrophosphate (GGPP). FPP and GGPP become attached to many cellular proteins and are utilized to synthesize other nonsterol isoprenoids such as dolichol, heme, ubiquinone, and vitamin K2, which play essential roles in various cellular functions. Sterols and nonsterol isoprenoids exert stringent feedback control on HMGCR through multiple mechanisms. This ensures constant synthesis of nonsterol isoprenoids, while avoiding toxic overaccumulation of cholesterol. One of these mechanisms</p>

			involves sterol-induced ubiquitination of HMGCR, which marks the enzyme for degradation from ER membranes that is augmented by nonsterol isoprenoids. In this study, we examine the contribution of this sterol accelerated ubiquitination/degradation to overall regulation of HMGCR in the livers of mice.
Jonathan White	Neurological Surgery	Obliteration rates of staged AccuRay Cyberknife Treatment	Background: When choosing to perform radiosurgery on a large or giant AVM, the physicians have some choices of which machines to use. The oldest and the most conventional being the Gamma Knife. Newer technologies for which there is not much outcome data include the LINAC (CyberKnife®, X-Knife®, Novalis®, and Peacock®) and the proton beam. To provide better care for large and giant AVM, the outcomes of these newer machines need to be evaluated. This study will be assessing the large and giant AVM obliteration rates, time to obliteration, and treatment side effects of the AccuRay Cyberknife.
Shilpa Chitnis	Neurology	Automated Gait Parameters Predict and Track Fast Versus Slow PD Progressors	Background: The APDM Mobility Lab is a computerized gait and balance assessment device which uses model-based signal processing methods to extract features from raw sensor data obtained during specific tasks conducted by subjects. The objective nature of this data suggests potential advantages over clinical rating scales if they can predict progression based on baseline data and can track disease progression over time. Objective: To utilize instrumented gait and balance measurements to identify specific parameters which have both prognostic and disease-tracking capabilities in PD.
Doris Lambracht-Washington	Neurology and Neurotherapeutics	Tau pathology in a triple transgenic (3xTg) mouse model of Alzheimer's disease (AD)	Background: Alzheimer's disease is the most common age-related form of dementia and the sixth leading cause of death in the United States. Pathological features include the accumulation of extracellular amyloid plaques composed of aggregate amyloid-beta peptide and intracellular neurofibrillary tangles containing phosphorylated tau protein. Mutations in the genes that express tau, amyloid precursor protein, and presenilin 1 have been shown to cause an early-onset Alzheimer's disease in humans. Hypothesis: Tau in the brain increases with age in Alzheimer's disease affected mice.

Munro Cullum	Neuropsychology	Detecting Alzheimer-Related Dementia in Less-Educated Patients with the Clinical Dementia Rating Scale	This study investigated the sensitivity and specificity of the CDR-SB score in detecting dementia associated with autopsy-proven AD in patients with less than 12 years of education. Hypothesis: Because lower education is associated with worse performance on neuropsychological tests such as the Mini-Mental State Examination, [12, 13] it was hypothesized that using the currently validated CDR-SB cut score for mild dementia (4.5) [2, 3] to classify less-educated participants by AD neuropathology would yield an unsatisfactory sensitivity and specificity (i.e. <70% on one or the other). Rather, a higher cut score, indicative of more severe apparent cognitive impairment, would be required to achieve optimal sensitivity and specificity (i.e. >70% on both measures).
Jane Johnson	Neuroscience	Scratch Bout Quantification in Ptf1a enhancer mutant mice	The Johnson laboratory has generated 2 mutant mouse strains where both the autoregulatory enhancer and the 3' DNT enhancer have been mutated (BM35E and BM36A). In contrast to Ptf1a null mice, these mutants survive past neonatal stages, but by 4-6 weeks of age they express a severe scratching phenotype, causing such severe skin lesions that euthanasia is required after a day or two of symptom initiation. We hypothesize that there is a specific loss of inhibitory input into itch circuits, due to loss of Ptf1a. Objective: Test the hypothesis that BM35E and BM36A null mice are more sensitive than wild type mice to itch induced by histamine and chloroquine.
Bradley Lega	Neurosurgery	The Differences in Neural Activation Caused by High Versus Low Calorie Foods	Obesity is a particularly prevalent and damaging condition afflicting our nation. The persistent exposure to and availability of cheap, high energy density food certainly contributes to this issue. Unfortunately, when such food is advertised, the images presented reach deeper than our pockets. They reach into our dopaminergic corticolimbic reward pathway and stimulate regions commonly linked to addiction and drug use. Following the fMRI literature on this topic, we developed a cognitive task that presented images from three different pools - high calorie foods, low calorie foods, and control images of kitchen-related utensils. After taking the epilepsy patients through the task, we extracted their sEEG data recorded over the time course of the experiment and aligned it with the clock of the computer that presented the images to them. This

			<p>resulted in a multiplicity of 3000 millisecond sEEG voltage tracings that correspond to the three seconds following the various image presentations. We need to both collect more data and apply more stringent non-parametric statistical tests to our data to check for significance.</p>
Danielle Robertson	Ophthalmology	3D and wide field in vivo confocal imaging of meibomian glands in contact lens wearers	<p>Background: Meibomian glands are specialized sebaceous glands situated on the inner margin of the tarsal plates. Their primary function is to produce meibum, a compositionally complex lipid secretion that promotes tear film stability and prevents evaporation. Meibomian gland dysfunction (MGD), characterized by impaired meibum delivery due to obstruction, inflammation, gland drop out, etc., is believed to be one of the most common disorders encountered in ophthalmic practice and the leading cause of dry eye disease (DED). A handful of studies have been conducted on MGD in contact lens wearers (CLWs). In particular, both Arita et al (2009) and Villani et al (2011) have shown an association between MGD and CL wear, with morphological changes correlated significantly with duration of wear. Hypothesis: CL wear leads to pathologic changes in MG architecture and morphology. Specific aims: (1) 3D image human eyelids in situ with DAPI and a lipid marker to confirm the identity of the presumed acini structures. (2) Montage peripheral eyelids to characterize normal gland architecture in non-CLWs, including distribution of size and morphology of MG acini. (3) Identify structural changes in MG acini in CLWs and develop methods for identifying and quantifying pathological structural changes.</p>
Jennifer Cao Yu Guang He	Ophthalmology	Presentation, Treatment and Outcomes of Patients Diagnosed with Uveitis Secondary to Ocular Toxoplasmosis	<p>Currently, there are no treatments to cure ocular toxoplasmosis. Furthermore, there is no consensus on the best treatment method for acute primary infection nor secondary reactivation. There are many of therapies available, however, the lack of scientific evidence has led to a lack of consensus among physicians, thus treatment plans are often based on the preferences of the treating ophthalmologist. Purpose In this study we characterized the patients treated at Parkland Memorial Hospital and Aston Ophthalmology Clinic for ocular toxoplasmosis, to survey the treatment regimens that have been used, and to determine</p>

			whether there are any risk factors that may indicate a better or worse prognosis.
John Hulleman	Ophthalmology	Understanding and regulating Transcriptional factor EB function (TFEB) in Retinal Pigment Epithelium (RPEs) Cells	Several inherited and age-related eye diseases (e.g., Stargardt disease and age-related macular degeneration, AMD) are characterized by the accumulation of lipid and protein deposits within lysosomes of retinal pigment epithelium (RPE) cells, potentially leading to lysosomal dysfunction, and ultimately contributing to RPE cell death. Recent studies have found that the transcription factor EB (TFEB) regulates expression of downstream genes that control lysosomal biogenesis and lipid catabolism. Thus, activating TFEB in RPE cells may serve as a unique and powerful approach to prevent lipid dysregulation and ameliorate pathological retinal damage in diseases such as AMD. However, too much activation of pathways such as those regulated by TFEB is counterproductive and likely detrimental, leading to cellular catabolism. Hence, we proposed to engineer a small molecule-regulated, genetically encoded system that allows us to turn 'on' and 'off' TFEB to investigate the effect of TFEB overexpression on lipid catabolism in RPE cells. Hypothesis: By constructing a conditionally active TFEB mutant, we can induce expression of downstream catabolic genes that can aid in lipid deposit degradation in diseased RPE cells in a controlled fashion.
Karanjit Kooner	Ophthalmology	Cataract and IOP	Objective-The purpose of this study is to determine the role played by various factors (age, gender, race, family history, biometric variables, glaucoma severity, prior filtering or laser procedures) on IOP outcomes in patients with and without primary open-angle glaucoma (POAG) undergoing cataract surgery.
Karanjit Kooner	Ophthalmology	Micro-pulse Laser Trabeculoplasty in Glaucoma	Glaucoma is the second leading cause of blindness in the world. In the United states there are an estimated 2.3 million adults over the age of 40 diagnosed with glaucoma and an additional estimated 2 million undiagnosed glaucoma cases. There are no current cures for glaucoma. Treatment focuses on lowering intraocular pressure (IOP) to stop the progression of glaucoma. Objective To determine the efficacy and safety of MLT as an adjunctive therapy in patients with medically uncontrolled POAG and how patient characteristics may influence MLT outcomes.

Ronald Mancini	Ophthalmology	A Study on the Effect of the Optic Nerve Fenestration Procedure on Post-Operative Intraocular Pressure	The optic nerve fenestration is a procedure in which a small incision is made into the optic nerve sheath to relieve elevated intracranial pressure, particularly pressure on the optic nerve. This procedure accomplishes this by allowing cerebrospinal fluid to slowly diffuse out of the optic nerve sheath. In this study, the objective was to observe any effects that an optic nerve fenestration procedure would have on intraocular pressure. We believed that reducing the intracranial pressure on the optic nerve may serve to also reduce intraocular pressure. This final goal of this study was to possibly shed some light on a possible cause or exacerbating factor of glaucoma, a disease in which the intraocular pressure is raised and the mechanism is not well understood.
Zachary Robertson	Ophthalmology	RESIDENT COMPLICATIONS OF INTRAVITREAL INJECTIONS IN A LARGE COUNTY HOSPITAL; A RETROSPECTIVE CHART REVIEW	This project looked at the complication rates and outcomes of resident administered intravitreal injections (IVI) in a large county hospital setting. A tear in the posterior capsule during cataract surgery can signify a serious complication as it means that the new intraocular lens can no longer be placed in the capsular bag with posterior support. The surgeon must then find a new location for it, most commonly the sulcus or the anterior chamber of the eye. According to the Center for Medicare and Medicaid Services, intravitreal injections are the second most commonly performed procedure by ophthalmologists in the United States after cataract surgery. Thus, it is worthwhile to look into the outcomes of these resident administered injections at the Parkland Eye Clinic. We hypothesized that while the complication rates or risk of these injections would not be high enough to invalidate their benefits, a history of intravitreal injections would significantly increase the risk of posterior capsule rupture during cataract surgery. I further hypothesized that a higher number of prior intravitreal injections would correlate with a higher posterior capsule rupture rate
Brigham Au	Ortho Surgery	Regional and Seasonal Variations in the Incidence of Post-Traumatic Infection After Open Fractures	The potential for infection after open fractures is a serious yet well documented morbidity for orthopaedic trauma patients. There are several factors that are known to influence the risk for infection such as prophylactic antibiotic administration times, time to surgical debridement, and the grade of the open fracture using the Gustilo-Anderson classification system. We hypothesize that causative

			organism and incidence of post-traumatic open fracture infections are dependent on the region as well as the season in which the injury occurred. Our study is part of a multi-center study.
Christine Ho	Orthopaedic Surgery	Treatment and outcomes of open distal tibia fractures	Tibial fractures are the most common pediatric lower extremity fracture and the third most common fracture in pediatric patients overall. By comparing surgeries for open distal tibia fractures with those for open tibial shaft fractures, we can elucidate the methods to help pediatric patients best recover from their complicated injuries. The aim of this study is to compare treatments and outcomes for open tibia shaft fractures with open distal tibia fractures and to disseminate that knowledge throughout the medical community.
Kenneth Estrera	Orthopedics	Retrospective study of complication rates in hip revision surgery	Background: Instability after total hip arthroplasty (THA) remains a persistent problem. It is the most common cause for revision THA in the United States and similarly is the most common complication after revision THA. Hypothesis: The dislocation rates of revision total hip arthroplasty utilizing dual mobility liners are no greater than those of primary and revision hip arthroplasty in to previously published
Robert Dimeff	Orthopedics and Family Medicine	Implementing a Standardized Interventional Exercise Regimen to Improve Functional Movements in Female Athletes	Intro and Objectives Time loss injuries, which require an athlete to miss the next scheduled competitive session, hold potential to significantly affect team performance and achievement. Female athletes, in particular, are twice as likely to develop time loss injuries as compared to males. The Functional Movement Screen (FMS) is a screening tool that has been used to gauge injury risk in athletes. Accordingly, it is possible that improvements in FMS score correlate with decreased incidence of time loss injuries. Studies have also shown asymmetry in FMS scores between extremities to correlate with a higher incidence of athlete injury. Though studies have implemented interventional exercises to improve FMS scores in male athletes, there is a paucity of data regarding similar programs used to help female athletes. Objectives The purpose of this study was to assess whether an in-season, standardized interventional exercise program improves the FMS scores of female soccer, softball, and basketball players, in addition to affecting asymmetry in those athletes' FMS scores.

Rene Galindo	Pathology	The role of genes KIRREL1 and KIRREL3 in Rhabdomyosarcoma	The Galindo Lab is interested in uncovering the mechanisms responsible for the muscle-type tumor rhabdomyosarcoma (RMS). Treatments for high-risk RMS have not improved for three decades, arguing that new genetic tools are needed to promote RMS gene discovery and enable the development of new precision therapies. Since we believe Kirrel-3 is essential for myotube formation, we hypothesized that when Kirrel-3 is silenced, the C2C12 cells would be slower to form myotubes, and the tubes would be smaller. After shRNA-silencing Kirrel-3, and then allowing the cells to differentiate, I used Crystal Violet staining to visualize the differentiate myotubes. It did appear that the Kirrel-3 silenced cells formed fewer and smaller myotubes when they differentiated, however the experiment was only conducted once and needs to be repeated a few more times to validate the results.
John Bird	Pediatric Allergy and Immunology	Peanut Allergy Oral Immunotherapy Study of AR101 For Desensitization in Children and Adults (PALISADE) Follow-On Study	Introduction: Peanut allergy is a common and serious condition that commonly affects children and is associated with severe reactions, including life-threatening anaphylaxis. The current standard of care in management of peanut allergy is a peanut-avoidant diet, along with education of the patient and family in the acute management of an allergic reaction. Oral immunotherapy (OIT) for peanut allergy has demonstrated encouraging safety and efficacy results in past clinical trials. One such study investigating the efficacy of OIT is the Peanut Allergy Oral Immunotherapy Study of AR101 For Desensitization in Children and Adults (PALISADE). This study is an international, multicenter study that has a scheduled final data collection date projected in November 2017.
Eric Gantwerker	Pediatric Otolaryngology	Growth Mindset, Grit, and Resilience and Correlation with Burnout Index	Burnout in our nation's physicians may have its roots earlier in medical education. While a longitudinal study was not conducted, the previously mentioned study of internal medicine residents found that a staggering 76% of responders were actively experiencing burnout (Shanafelt et al. 2002). Since medical school is an environment of constant feedback, we have reason to believe that personal theories of intelligence could be a significant predictor of susceptibility to burnout and a target for intervention. Similarly, the extremely challenging nature of medical school curriculum suggests that Grit would also be useful in predicting the

			incidence of burnout. We hypothesize that lower Grit and an entity view of intelligence will correlate with a higher incidence of burnout.
Alana Beres	Pediatric Surgery	A retrospective analysis of Non-accidental trauma outcomes in Pediatric trauma centers	Background: Non-accidental trauma (NAT) is a major cause of pediatric morbidity and mortality and often unrecognized until patients present with severe injury or death. In 2014, the Administration for Children and Families (ACF) reported 702,208 pediatric victims of abuse and a mortality rate of 2.13 per 100,000. NAT is a significant health concern with real financial and human costs. Previous research shows disparities in the delivery of health care related to race, ethnicity, income, and insurance status. Objective: To determine if NAT children at Children's Health have worse health outcomes in those children of lower socioeconomic status, no insurance, minorities, female sex, and at a larger disproportion compared to the those found in the National Trauma Data Bank.
David Schindel	Pediatric Surgery	A Retrospective Review of the Efficacy and Outcomes in Children Receiving a Laparoscopic Colectomy	Objective: A comparison of clinical outcomes in children who received an ileo-anal pouch anastomosis due to a diagnosis of familial adenomatous polyposis (FAP), ulcerative colitis (UC), or indeterminate colitis.
Faisal Qureshi	Pediatric Surgery	The management of expanding traumatic retroperitoneal hematoma	Retroperitoneal hematomas secondary to blunt trauma have a longstanding pattern of case-based treatment in pediatric patients. Indications for surgical exploration of the hematoma include hemodynamic stability, expanding vs. nonexpanding, and any associated visceral or vascular injury. Expanding retroperitoneal hematoma secondary to trauma has been an indication for surgical exploration in adults to evaluate injury to central vessels. This management strategy has been applied to children, but it has not been examined carefully, nor have other factors been examined in evaluating a traumatic retroperitoneal hematoma in pediatric patients. Purpose: To describe the management of traumatic retroperitoneal hematomas in hemodynamically stable pediatric patients and evaluate the significance of the factors involved in determining mortality.

Joseph Murphy	Pediatric Surgery	A Retrospective Analysis of Pancreatic Resection Outcomes at a Pediatric Tertiary Care Center	Background Pediatric patients with pancreatic diseases rarely require surgical resection. While the indications for and surgical outcomes of pancreatic resection surgeries in adult populations are well documented, the safety and efficacy of these procedures for pediatric patients are poorly understood due to the scarcity of data. In the rare clinical situations where pancreatic resection may be appropriate in the treatment of a child or adolescent, there is little data to guide health care providers in its use. Objective The project is to gain a better understanding of the indications for and outcomes of pancreatic resection surgeries, which are distal pancreatectomy, pancreaticoduodenectomy (Whipple), lateral pancreaticojejunostomy (Puestow Procedure), central pancreatectomy, and total pancreatectomy in the pediatric population of the desmoid tumor, which showed negative surgical margin.
Ralf Kittler	Pharmacology/McDermott Center for Human Growth and Development	Analysis of Various Transcription Factor Inhibitors in Glioblastoma Multiforme	Objective: The purpose of this research was to analyze the effect of several purported transcription factor inhibitors on ZEB1, B2M, and OLIG2 gene expression and on the overall proliferation of GBM cells..
Donald Hilgemann	Physiology	Further elucidations of Na-K Pump regulation via DAGK	Hypothesis / Objective: DAGK activity has been proposed to have anti-hypertrophic effects by increase NKP activity. It is hypothesized the MEFs with a KO DAGK ζ would result in increased DAG availability and more inhibition of NKP activity, seen by decreased NKP current magnitude. Examining the absence of DAGK ζ was complemented by studying overexpression of the same DAGK ζ as well DAGK ϵ . Further investigation required transfection of DAGK ϵ and DAGK ζ into human embryonic kidney (HEK) cells tagged with GFP, to allow for overexpression of the protein of interest. It is hypothesized that overexpression of DAGK ϵ would result in decreased DAG availability, decreased inhibition of NKP activity, seen by increased NKP current magnitude. DAGK and NKP have both been studied in the context of cardiac hypertrophy. Now, we were closer to unraveling the mechanism of DAGK regulation on NKP, that may lead to pathophysiological effects.
Nicholas Haddock	Plastic Surgery	Age Effect on the Number of Surgeries in	The rate of mastectomies and subsequent tissue-expander-based breast reconstruction is increasing amongst women of all ages. At

		Tissue Expander Breast Reconstruction	any age, different factors such as complications or aesthetic revisions can lead to additional trips to the operating room. Given that any surgery carries some risk, we sought to investigate whether the total number of surgeries a patient would expect to have during the process of breast reconstruction varied based on the patients age.
Summet Teotia & Nicholas Haddock	PLASTIC SURGERY	THE IMPACT OF NEOADJUVANT CHEMOTHERAPY ON THE NUMBER OF SURGERIES IN DELAYED BREAST RECONSTRUCTION	Recent literature has demonstrated that patients undergoing neoadjuvant chemotherapy (NACT) tend to have their breast reconstructions delayed. We were motivated to further explore how many surgeries these patients are required to undergo before completion of their reconstruction.
Raksha Jain	Pulmonary Medicine	EVALUATING THE IMPACT OF CHRONIC INFLAMMATION IN CYSTIC FIBROSIS ON BONE HEALTH	Objective: The aim of the project is to investigate the reason behind why patients with CF are at a greater risk for osteoporosis. Because CF patients have an extensive history of chronic inflammation, it is reasonable to predict that this could possibly play a role in the pathway that leads to their increased risk of osteoporosis. Uncovering more about the process that leads to this risk is important because there are not many targeted treatment strategies currently available for patients with CFRBD.
Amit Banga	Pulmonary/Critical Care/Internal Medicine	The Characterization of Venous Thrombo-embolic Events in the Early Period after Lung Transplantation and the Impact on Outcomes	Background: Venous thrombo-embolic (VTE) events are common in post-operative period, especially among post-transplant patients. There is limited data regarding the risk factors for early VTE and their association with outcomes among patients with lung transplantation (LT) There is also limited data regarding the association of VTE with long term outcomes. Hypothesis: Pre-transplant characteristics of lung transplant recipients are associated with post-transplant VTE events in the first 30 days following transplantation, including pulmonary embolism and deep venous thrombosis. Development of VTE within the first 30 days post-transplant is associated with worse outcomes at 1 year and 3 year post-transplant.
Nathan Kim	Radiation Oncology	Radiation therapy delivered with deep inspiration breath hold with ABC technology for	Radiation therapy typically requires daily treatments over several weeks. Deep inspiration breath hold (DIBH) is an important technique utilized during radiation therapy for organ sparing. Active breathing control (ABC) is a technology available to make DIBH

		locally advanced left sided breast cancer patients is safe and efficacious.	reproducible and accurate during delivery of radiation treatments. DIBH with ABC is used for treatment of left sided breast cancer at UT Southwestern to minimize cardiac tissue exposure to radiation. Patients with locally advanced breast cancer can require a complicated treatment region; therefore, a field matching technique is often employed, with each field being irradiated one at a time. This technique has a potential risk of fields overlapping (causing overdosing) or if not accurately matching, underdosing at or near the match line. In free breathing patients, this matching technique has been demonstrated to be safe and effective. However, with DIBH, the safety of employing this field matching technique has not been reported. Hypothesis ABC technology assisted DIBH is an accurate, reproducible, safe and effective means of delivering matching field radiation treatments for left sided breast cancer patients.
Aveensh Chhabra	Radiology	Bony Bump and Soft Tissue Analysis: Differences in Acetabular Dysplasia and Femoral Acetabular Impingement	In this retrospective radiology research project, differences in femoral head-neck anatomy and soft tissues were explored among patients with hip dysplasia, femoral acetabular impingement (FAI), and asymptomatic controls. We hypothesized there would be significant differences in the femoral head-neck junctional anatomy, quantified by the bump volume ratio, in the muscle density and bulk, and the fat content among these three groups of patients. were analyzed for visceral, subcutaneous, and total fat, as well as outer circumference.
Diane Twickler	Radiology	Determining the MRI Features and Diffusion Characteristics of Normal Placenta and Placental Invasion	The purpose of our study is to assess the appearance of the human placenta on fetal magnetic resonance imaging (MRI) including diffusion weighted imaging to detect placental invasion (morbidly adherent placenta), a condition where the placenta has invaded the uterus to the extent where it is inseparable after birth, leading to highly morbid and fatal complications, such as severe hemorrhage. HYPOTHESIS We hypothesize that a greater extent of abnormal placental imaging findings, assessed using diffusion weighted imaging and quantified by numerical scores based on the presence of dark linear bands, focal bulging, lacunae, previa and area involvement, corresponds to more severe forms of morbidly adherent placenta--placenta percreta, increta, accreta.

Kristen Bishop	Radiology	Creation of a Radiology Resource for the Anatomy Curriculum	The goal of this project was to create a labeled CT image series for the abdomen, male pelvis, and female pelvis to supplement the radiology lectures of the lecture portion of the Human Structures course and anatomy lab curriculum.
Rathan Subramaniam	Radiology	Influence of post-treatment PET/CT on patient outcomes and management after definitive chemoradiation therapy in oropharyngeal squamous cell carcinoma	Hypothesis/objective: The objective of the present study is to assess the utility of PET/CT compared to CT or MRI in impacting patient survival and management in the two-year period following definitive chemoradiation therapy for OPSCC. The utility of PET/CT in the first six months versus the next 18 months of the two-year post-treatment period will be compared in terms of patient survival and management as well.
Takeshi Yokoo	Radiology	DEEP LEARNING LIVER ULTRASOUND ECHOTEXTURE TO PREDICT HEPATIC FIBROSIS	Liver fibrosis is the histopathological hallmark of advanced diffuse liver disease, indicators for cirrhosis, liver cancer, and liver failure. Historically, liver biopsy has been the only method for staging fibrosis. Recently, ultrasound and magnetic resonance elastography techniques have been validated as a noninvasive biomarker of liver fibrosis. Recently developed deep learning CNN approach provides a natural computational framework to enable fibrosis prediction via ultrasound echotexture. Objective: We hypothesize that ultrasound echotexture, analyzed by trained neural network, predicts severity of liver fibrosis.
Takeshi Yokoo	Radiology	Deep Learning Liver Ultrasound Echotexture to Predict Hepatic Fibrosis	Liver fibrosis is the histopathological hallmark of advanced diffuse liver disease. Fibrosis left untreated leads to cirrhosis, liver cancer, and liver failure. While liver biopsy has historically been the only method for staging fibrosis, ultrasound (US) and magnetic resonance elastography techniques have recently been validated as a noninvasive biomarker of liver fibrosis. However, elastography remains expensive and limited in availability. Alternatively, image texture on liver US (called echotexture) is well known to become progressively heterogeneous in advanced liver disease and cirrhosis, though radiologists' subjective perception of echotexture is too variable to accurately diagnose and stage fibrosis in clinical practice. Deep convolutional neural networks (CNN) provide a natural computational framework for analyzing liver texture from US images, and may offer a more cost-effective means of

			noninvasively detecting liver fibrosis and measuring its severity. HYPOTHESIS: Ultrasound echotexture, analyzed by a trained convolutional neural network, predicts severity of liver fibrosis.
Anne Satterthwaite	Rheumatology	Effects of altering Ets1 expression on B cell antibody production and the development of autoimmunity	Background B cells are cells of the adaptive immune system that elicit the humoral immune response. When activated by foreign antigens, such as those expressed by a bacteria or virus, they differentiate into plasma cells (PCs) that secrete antigen-specific antibodies. This process is under tight control, as unregulated differentiation of B cells that recognize self-antigens can lead to pathogenesis as seen in Systemic Lupus Erythematosus (SLE). Strategies to prevent the downregulation of Ets1 in B cells may abrogate the development of autoimmunity or limit the antibody response to foreign antigens. Hypothesis B cell expression of Ets1 stops antibody production in response to foreign antigens.
Nancy Puzziferri	Surgery	Longitudinal effects of surgical weight loss on brain structure	Obesity is a rising global epidemic that has more than doubled since 1980. Even with the millions of lives lost annually, obesity carries a greater burden through the numerous associated comorbidities. A relatively new area of research is obesity's effect on the brain. Objective: First, we hypothesized the brain gray and white matter densities for the women with obesity would be significantly lower than their lean counterparts. Second, we hypothesized brain gray and white matter densities in women with obesity will significantly increase after surgical weight loss. Finally, we asked is there an effect on gray and white matter densities over time due to weight loss.

Sergio Huerta	Surgery	Current Trends of Pilonidal Disease at a Veteran Administration Hospital: a 12-year experience	Pilonidal disease is a process that arises from hair follicles in the sacrococcygeal region of hirsute individuals with deep natal clefts resulting in abscess formation and chronic inflammation. Despite the common nature of this disease, controversy over a standard surgical treatment continues. PD has an incidence of 26 per 100,000 individuals and more commonly develops in men than women. The aim of the current study was to investigate the incidence and outcomes of patients undergoing surgical intervention for PD at the VANTHCS. This is a retrospective review of a single institution study at the VANTHCS. We reviewed outcomes of patient undergoing surgical intervention for PD in the Computer Patient Record System (CPRS) by all general and colorectal surgeons over the past twelve years (2005-2017).
Steven Wolf	Surgery	Mitochondrial dynamics in regulating myogenesis in burn serum stimulated muscle cells	Objective. The purpose of this study is to understand the mechanism of the fission/fusion cycle of mitochondria in response to severe burn. Our work was guided by 2 main goals: 1) to investigate whether Mfn1 critically regulates mitochondrial dynamics in response to burn; 2) to examine mitochondrial marker profiles in response to severe burn in vivo.
Steven Wolf	Surgery	Insulin and exercise combination therapy recovers muscle function in a burn and disuse rat model through activating protein synthesis and inhibiting proteolysis pathways	Background: Severe burns induce a hypermetabolic state resulting in a loss of muscle mass and muscle function ¹ . Like burns, disuse of muscle also results in muscle loss ² . Loss of muscle mass is a direct consequence of two competing mechanisms, protein synthesis and proteolysis. Resistance exercise and insulin have independently been shown to attenuate muscle atrophy, though neither is fully compensatory ^{1,3} . To date, no data on the effects of insulin and exercise as a combination therapy targeted to recover muscle mass and function after severe burn have been reported. This project investigates the molecular mechanisms of musculoskeletal pathophysiological improvements in a burn and disuse rat model with these treatments. Muscle function, protein synthesis/proteolysis signaling pathway protein levels, and genomic profiles were examined. Hypothesis: Insulin and exercise combination therapy recovers muscle function in accordance with muscle morphology improvements by upregulating protein synthesis pathways and decreasing muscle proteolysis.

Michael Cripps	Surgery - Trauma	Acute Coagulopathy of Trauma and Hyperfibrinolysis	<p>Previous analysis of hyperfibrinolysis has demonstrated that it can occur at different time points. This is the so called early, intermediate, and late fibrinolysis. It is likely that there are biochemical differences in these patients and it is certainly seen on viscoelastic testing. Our overall aim is determine the biochemical and clinical differences between those patients with different rates of fibrinolysis. Our hypothesis is that there are distinct phases of fibrinolysis that result from differing severities of trauma and occur through different biochemical pathways. Our specific aims are to: 1) To determine the rate of hyperfibrinolysis in trauma patients who have had a viscoelastic analysis performed on arrival 2) To compare coagulation factor concentrations in patients with the different rates of fibrinolysis 3) To determine the mortality of patients who have hyperfibrinolysis 4) To compare the clinical differences among the different types of hyperfibrinolysis 5) To determine the efficacy of administration of anti-fibrinolytics 6) To determine if there are reliable predictors of hyperfibrinolysis that can be used when there is no access to ROTEM technology.</p>
Michael Cripps	Surgery- Trauma Department	Assessment of Hemostatic Profile and Venous Thromboembolism in Trauma	<p>Venous thromboembolism (VTE), comprised of deep vein thrombosis (DVT) and pulmonary embolism (PE), represents a significant cause of morbidity and mortality in trauma patients. Due to these reasons, VTE detection and prevention practices have very little standardization throughout hospitals. There is, however, potential for the use of more sensitive and sophisticated laboratory testing to determine the coagulation profile. In this study, our primary objective is to compare thrombin generation (pre and post surgery) using calibrated automated thrombogram (CAT) and other methods in patients who are undergoing surgery for orthopedic injuries. A secondary objective will be to determine if there is a relationship between thrombin generation after surgery and VTE. We will also prospectively and retrospectively evaluate our VTE risk assessment module prevention algorithm that is in place for trauma patients at Parkland Hospital</p>
Joshua Gatson	Surgery/Neurosurgery	Administration of Fatty Acid Emulsions to	<p>In this study, we hypothesized that Smoflipid reduces inflammation in the brain of adult mice that have suffered a mild-to-moderate brain injury. Smoflipid® is an injectable liquid emulsion solution that</p>

		Reduce Secondary Brain Injury in Mice	contains omega-3, omega-6, omega-9, and medium chain triglycerides. Methods: In this study, mice were subjected to a moderate brain injury using the controlled skull impact device (Leica microsystems) and we administered Smoflipid® intraperitoneally at day 1 and 3 after injury. At Day 14 after injury and treatment the mouse brains were harvested, processed, and stained using immunohistochemistry for the inflammatory markers, glial fibrillary acidic protein (GFAP) and ionized calcium-binding adapter molecule 1 (Iba1).
Patricio Polanco	Surgical Oncology	Pre-operative Prediction of Non-Home Discharge following Cytoreductive Surgery and Hyperthermic Peritoneal Chemotherapy: A Strategy to Improve Discharge Planning	Background: Peritoneal carcinomatosis (PC) is defined as tumor dissemination within the peritoneal cavity from a primary tumor typically of gastrointestinal or ovarian origin, and in unusual cases a mesothelioma. The diagnosis of PC used to be approached with therapeutic hesitation and was typically treated with palliative chemotherapy. The advent of the surgical therapy, cytoreductive surgery and hyperthermic peritoneal chemotherapy (CRS/HIPEC), has recently offered improved long-term survival, and in a subset of patients has even had curative potential. However, despite these improvements, CRS/HIPEC continues to be associated with significant morbidity and requires efficient multidisciplinary collaboration and perioperative/postoperative planning. Objective: The aim of this study was to determine the rate of NHD following CRS/HIPEC and to identify predictors of NHD in a national cohort of patients in order to provide improved patient counseling and discharge planning preoperatively.
Philippe Zimmern	Urology	Does Initial Retention After Macroplastique Injection in the Management of Stress Urinary Incontinence Due to Intrinsic Sphincter Deficiency in Women Predict Success?	Background: Urethral bulking agents are a commonly employed agent in the treatment of stress urinary incontinence secondary to intrinsic sphincter deficiency. Collagen was one of the most widely used and accepted bulking agents until 2011 when it ceased to be manufactured. Since then, we have turned to Macroplastique (MPQ), with current supportive evidence coming from both European trials and short-term data collected in the United States. However, sufficient long-term data on Macroplastique and factors predicting its success have not yet been published. Objective: Does initial post-operative retention after MPQ injection predict success? Hypothesis: We hypothesize that women with transient post-

			operative urinary retention will fare better long-term than those with normal voiding.
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