Mentor Name:	Mentor Department	Title of Proposed Project	Hypothesis
Philip Greilich	Anesthesiology	Assessing Efficacy of Improved Cognitive Aid in Transfers of Care ('Handoffs') from the OR to the ICU following Cardiac Surgery	Specific Aims/Hypothesis: The goal of this research project is to manipulate the location and design of the existing cognitive aid, and assess if changes in the presentation of the cognitive aid will help OR and ICU teams better comply with the institutional patient handoff protocol. Since the existing cognitive aid is a checklist-style paper, which is often not present at the site of the patient handoff or omitted from the patient's chart, we predict that improving the presentation and availability of the cognitive aid will enhance adherence to the institutional patient handoff protocols.
Uttam Tambar	Biochemistry	Synthesis of Small Molecules Capable of Interfering with Tumor Vascularization through Binding and Inactivating HIF protein.	Once synthesized, the compounds will show the capability to reduce tumor vascularization and thus cell proliferation of cancer cells via inhibition of the HIF hypoxia pathway. The comparative efficacies can be then determined and the best, selected. Specific Aims: The synthesis of a derivative of a certain class of molecules that has been previously determined to inhibit the HIF molecule. Inhibition of the HIF pathway is a possible biochemical pathway to target in fighting cancer cells that upregulate this protein to vascularize and nourish themselves.
Steven Wolf	Burn Section, Department of Surgery	Bronchoalveolar Lavage and the Diagnosis of Pneumonia in the Burn ICU	It is our Hypothesis that the redefined criteria are prevalent in the mechanically ventilated burned patient, and are not particularly relevant in terms of outcomes and therefore quality.
Benjamin Chong	Dermatology	Lupus Nephritis Outcomes In Discoid Lupus Erythematosus Patients	Patients with LN and DLE exhibit a less severe renal disease than LN patients without DLE. Methods: A thorough chart review will be performed for this retrospective study, which has been already approved by the UTSW IRB.
Heidi Jacobe	Dermatology	The characterization of cell-type specific expression of CXCR3 ligands in Morphea.	Our Hypothesis is that CXCL9 and CXCL10 are expressed in the lesional skin of and direct T-lymphocyte migration and subsequent propagation of inflammation in Morphea. The resident's overall project aims are to characterize inflammatory infiltrate in morphea using immunohistochemical staining, to determine the expression pattern of IFNγ, CXCR3 receptor, CXCL9, and CXCL 10 in lesional skin of patients with morphea using immunohistochemistry, and to determine the specific cell-type expressing CXCL9 and CXCL10 in lesional skin of patient with morphea using colocalization of cell-specific markers with CXCR3 ligands via immunofluorescence microscopy.
Benjamin Chong	Dermatology	MRL-lpr Mouse Model of Cutaneous Lupus	Aim and Hypothesis: The aim of this project is to determine whether type I IFN-inducible genes are up-regulated in the skin of irradiated MRL-lpr mice. We hypothesize that as human cutaneous lupus erythematosus skin lesions show enhanced expression of type I IFN-regulated genes, that these genes will also be up-regulated in the skin lesions of irradiated MRL-lpr mice.
Owen A. Obel,	Electrophysiology and Pacing	Device-based algorithms to attenuate the effect of	Our Hypothesis is that these device algorithms are ineffective at producing adequate biventricular paced beats in the presence of atrial fibrillation. This is a prospective

		atrial fibrillation on cardiac resynchronization therapy	study. Our study design includes bringing patients into the exercise laboratory and using a 12-lead electrocardiogram recording while their device algorithm is turned on and they exercise on a treadmill or stationary bike if patients have ambulatory limitations.
Robert Suter	Emergency Department	Is Heated High Flow Nasal Cannula in the Emergency Department Safe?	The use of HHFNC in hypoxic patients in the emergency department is safe and will not cause any adverse events. Specific Aims: Aim #1: Determine if the use of Heated High Flow Nasal Cannula is safe and effective in hypoxic patients in the emergency department. Study Design: This will be a convenience sample of patients with O2 saturation <93% who consent to treatment with HHFNC in an academic hospital's emergency department. We will measure respiratory rate, pulse oximetry, and dyspnea scores prior to HHFNC, at 15 min, 30 min, and 60 min of use. Adverse events will be determined by the physician, nurse, respiratory therapist, or patient and documented in the medical chart. Oxygen will be delivered via Optiflow's HHFNC device produced by Fisher & Paykel Healthcare.
Scott Goldberg	Emergency Medicine	Pediatric Point-of-Care Glucose Measurements in Pediatric Patients: Are They Necessary?	This study aims to evaluate the adherence to pre-hospital guidelines of POC blood glucose measurement for seizing pediatric patients.
John Pease	Emergency Medicine	The Use of Vapocoolant in the Adult Population to Improve Patient Perception of Pain with Peripheral Intravascular Access	The purpose of this study is to determine if the use of vapocoolant as a local anesthetic prior to PIV insertion reduces patient anxiety and pain in an adult population. This study will operate on the basis of a null Hypothesis which assumes that there is no relation between the use of vapocoolant as a local anesthetic prior to PIV insertion and a reduction in patient pain and anxiety with respect to PIV insertion.
Lynn Roppolo	Emergency Medicine, Department of Surgery	A Retrospective Study Comparing Standard Laryngoscopy to King Vision Video Laryngoscopy and the Glidescope Intubation Systems during Endotracheal Intubation	This study aims to evaluate the intubation success rates, time to intubation, associated complications, and resident/attending preferences with respect to the King video laryngoscope (VL), the Glidescope VL, and traditional direct laryngoscopes.
Kurt Kleinschmidt	Emergency/ Toxicology	Healthcare Provider Radiation Exposure from Patients Receiving Ventilation-Perfusion Scan in the Emergency Department	Despite receiving a heavy dose of radioactive material delivered to the lungs, post-VQ Scan patients will not deliver any significant radiation to healthcare providers.
David Greenberg	Infectious Diseases	Disrupting Bacterial Biofilms with Antisense Molecules	We can use phosphorodiamidate morpholino oligomers (PMOs) to disrupt these pathogens in a sequence-specific manner. Specifically, we will design PMOs against genes that are critical for biofilm formation and prevent or alter the structure of the

			biofilm so that classic antibiotics can better penetrate this structure leading to increased bacterial cell death.
Rhonda Souza	Internal Medicine	Inhibition of Cell Proliferation and Epithelial-Mesenchymal Transition of Dysplastic Barrett's Epithelial Cells by targeting the VEGF Signaling Pathway	We hypothesize that VEGF signaling promotes proliferation and EMT features in dysplastic Barrett's epithelial cells, perhaps causing SSIM and recurrent metaplasia after RFA. Our specific aims for this summer project I are to investigate the role of VEGF signaling on 1) a positive VEGF feedback loop, 2) cell proliferation, and 3) EMT features in dysplastic Barrett's epithelial cells in vitro.
Emmanouil Brilakis	Internal Medicine	Effects of ER-Niacin on Carotid Intima-Media Thickness in patients with Intermediate SVG Lesions	Use of ER-niacin in patients with intermediate SVG lesions will result in less increase in mean carotid intima-media thickness at 12 months compared to placebo. Specific Aims: Analyze all baseline and follow-up carotid ultrasound images to determine whether compared to placebo, administration of ER-niacin will result in less increase in mean carotid intima-media thickness at 12 months.
Amit Singal	Internal Medicine	Early ultrasound detection of hepatocellular carcinoma based upon patient characteristics	Ultrasound surveillance is less effective in patients with high BMI, ascites, and high nodular livers
James Brugarolas	Internal Medicine	Development and Epidemiological Evaluation of a Webtool for Community Oncologists Treating Renal Cell Carcinoma	To help resolve some of the clinical uncertainty that surrounds the treatment of RCC patients, I will help to design, develop, implement, and evaluate a secure website for community oncologists treating RCC patients. The purpose of the website will be to help guide the clinical decision-making of the community oncologist by suggesting evidence-based treatment options based on the patient's specificities. The website will also help to provide better care by offering continued education on the fast-evolving subject of kidney cancer as well as patient education content regarding new RCC treatments and clinical trials. The decision-making algorithm will be supervised by Dr. Brugarolas, an expert in the treatment of RCC, while the website design and implementation will be supervised by Dipti Ranganathan, vice-president at UTSW of Academic Information Systems
Emmanouil Brilakis MD	Internal Medicine-Cardiology	Frequency, Treatment, and Outcomes of Perforations During Chronic Total Occlusion Percutaneous Coronary Interventions	We hypothesize that the perforations in CTO PCI stem from the same causes as general PCI and seek to characterize the risk factors and angiographic characteristics which cause perforations. We further hypothesize that the incidence of perforation and other related complications (such as cardiac tamponade and need for emergency cardiac surgery) is low in contemporary CTO PCI due to prevention measures, improved technique of antegrade approach for standard procedures, and improved technique of retrograde approach for aggressive procedures. Specific Aims: 1) To define the incidence of perforations as a consequence of CTO PCI and assess the risk factors and angiographic characteristics that contribute to the incidence of perforation. 2) To determine the frequency, treatment, and outcomes of perforation during CTO PCI at our institution; 3) To determine the frequency, treatment, and outcomes of

			perforation during CTO PCI in the published literature. 4) To evaluate the technical decisions used to prevent and lower the incidence of perforations.
Joseph Hill	Internal Medicine, Molecular Biology	Molecular Mechanisms and Benefits of Pathological Cardiac Autophagy	In the question of controlling the stress-induced hypertrophy, cardiomyocyte autophagy is being considered as a potential mechanism for manipulating and correcting the adverse effects resulting from hypertrophy.
Emmanouil Brilakis	Internal Medicine/Cardiology	Outcomes of Novel ADP P2Y12 Inhibitors in Patients Undergoing Percutaneous Coronary Intervention	Hypothesis Use of novel ADP P2Y12 inhibitors (prasugrel and ticagrelor) in patients undergoing PCI is associated with low incidence of major adverse cardiac events and low incidence of major bleeding. Specific Aims To examine the outcomes of novel ADP P2Y12 inhibitors (prasugrel and ticagrelor) in "real world" patients undergoing PCI.
Emmanouil Brilakis	Interventional Cardiology	Long-term Outcomes of the SOS (Stenting of Saphenous Vein Grafts) Trial	Use of PES in SVGs is associated with lower incidence of major adverse cardiac events compared to bare metal stents during long-term follow-up. Specific Aims: To compare the incidence of major adverse cardiac events between patients receiving BMS and PES in the SOS trial.
Anil Pillai	Interventional Radiology	Transjugular Intrahepatic Portosystemic shunts(TIPS): technical variations influencing outcomes by modification	Although TIPS is generally accepted as a successful procedure there is little evidence to guide physicians on the technical aspects of the procedure. One such aspect is the distance the distal end of the stent should be placed from the inferior vena cava (in cm). Our goal is to retrospectively categorize key parameters for approximately 100 TIPS procedures from Parkland and St. Paul and assess success based on these technical variations.
James Amatruda	Molecular Biology	Melanocyte proliferation in mitf:EWS-FLI1 transgenic zebrafish is a relevant in vivo model of EWS-FLI1 cellular function, and performing functional and chemical genetic screens on the transgenic fish may help identify new therapies for Ewing sarcoma	Small molecules that inhibit EWS-FLI1 function will prevent pathologic melanocyte proliferation
Michael Brown	Molecular Genetics	Mechanism for insulin stimulation of lipogenesis	The mechanism for insulin stimulation of lipogenesis has been unclear. Previous experiments have suggested that Bhlhe40 involved in this pathway. We suspect that insulin phosphorylates Bhlhe40, which in its phosphorylated form binds to LXR, a known regulator of cholesterol and bile acid synthesis.
Samuel L. Barnett	Neurological Surgery	Atypical Meningiomas: Classification and Recurrence	The significant jump between Grade II and Grade III histological qualifications, coupled with the relatively heterogeneous clinical behavior of Grade II meningiomas might indicate the existence of a subgroup of atypical meningiomas with uniquely

			poor prognoses. Identification of this subgroup of patients may help guide patient management and provide important prognostic information. Specific Aims To determine (1) if there exists some underlying feature or group of features that tie together atypical meningiomas with poor prognoses, and (2) whether this might serve as an axis to differentiate patients who would and would not benefit from adjuvant radiation.
Venkatesh Aiyagari	Neurological Surgery, Neurology & Neurotherapeutics	BCI Communication for ICU Patients	For our project, in collaboration with the department of Electrical Engineering at the University of Texas, Dallas, (UTD) we have developed a prototype of an easy-to-use brain computer interface (BCI) system that utilizes electroencephalography (EEG) sensors to identify the users' intent. This system includes easy-to-wear dry-contact electrodes, wearable and wireless EEG acquisition systems, and advanced algorithms to process and integrate the data received from the patients in order to identify their need. Theoretically, patients should be able to communicate simply by looking at specific parts of a computer screen that flicker at different frequency rates and the computer should register their need and voice it out loud.
Roger Rosenberg	Neurology and Neurotherapeutics	Analyses to the efficacy of a DNA Aβ42 immunization approach to remove senile plaques and tangels in a triple transgenic mouse model	Aim 1: Analyses to the immune responses in the immunized mice. The student will determine Aβ42 antibody levels, antibody titers and isotypes. The student will also characterize the cellular immune responses with the determination of cytokine levels produced in the in-vitro cellular recall responses and phenotypic characterizations to the T cell compartments in these mice. Aim 2: Biochemical analyses of the brains. The student will perform a number of Western Blots to analyze the various Aβ oligomers present in the brains of the transgenic mice and compare the levels of these oligomers between the treatment groups (DNA Aβ42 immunizations, Aβ42 peptide immunizations, control DNA immunizations and untreated mice). The presence of the differently phosphorylated tau proteins will be analyzed in similar Western Blots.
Elliot Frohman	Neurology and Neurotherapeutics, Ophthalmology	An investigation of the architecture of the retinal-hypothalamic nervous system and its role as a biomarker and intervention target for multiple sclerosis.	Hypothesis: Multiple Sclerosis entails noticeable alterations in retinal cell layers. It is our Hypothesis that the retina, being a much more easily accessible organ than the brain, should allow for tangible tracking of the progression of disease and alleviating symptoms related to retinal-hypothalamic communication deficiencies.
Todd Roberts	Neuroscience	Dissecting synaptic changes that underlie the temporal control of vocal behavior	Hypothesis/Specific Aim: I will examine if induced changes in the temporal organization of a bird's learned song are accompanied by changes to excitatory synapses on neurons important for song motor control. We hypothesize that 1) shifts in the temporal features of a bird's song will be accompanied by the gain of new synaptic connections and the loss of previously stable synapses, and that 2) behavioral reversal of changes in song timing will be associated with a reversal in the observed changes to synaptic structure. If we are able to identify synaptic correlates of behavioral plasticity we will design experiments to test the causality between synaptic changes and behavioral learning.

Jane Johnson	Neuroscience	The role of Ascl1 (Mash1) in NG2+ cells during development and in the adult spinal cord	We propose that Ascl1 is required to keep NG2 cells in a proliferative state, and the loss of Ascl1 specifically in NG2 cells will alter their development and differentiation. Specific Aims/Study Design: Aim 1: Determine the requirement of Ascl1 in NG2+ OPCs during embryogenesis in the spinal cord.
Babu Welch	Neurosurgery	Magnetic Resonance Imaging in Intracranial Arterial Stenosis	Hypothesis: High-resolution MRI techniques will identify structural characteristics that are different between stenosis of atherosclerotic and inflammatory etiologies. This structural data, combined with a better understanding of vasoactive patterns, will provide predictive information about the recurrence of ischemic events in patients; specifically which patients and which regions in the brain of the patients might be at a higher risk for ischemic events. Specific Aims: Specific Aim 1: Use magnetic resonance imaging (MRI) techniques to better characterize vessel wall thickening and therefore suggest an atherosclerotic vs. inflammatory cause of the vessel stenosis. Specific Aim 2: Measure cerebral vasoactive parameters with advanced MRI methods and correlate the imaging results with clinical diagnosis Specific Aim 3: Conduct clinical follow-up reports of ischemic events in patients with specific patterns of vascular stenosis to evaluate clinical treatment methods
Chan Nguyen	Ophthalmology	Intravitreal toxicity study of two iNOS inhibitors: aminoguanidine and 1400W	Hypothesis Intravitreal inhibition of iNOS using aminoguanidine and 1400W is not toxic and may be a viable strategy for the treatment of diabetic retinopathy. Methods 1) New Zealand albino rabbits will be divided into groups of four. 2) Each group of rabbits will receive an intravitreal injection of different doses of aminoguanidine (10, 50, or 100 mg/ml) in one eye. The contralateral eye will serve as a control. The rabbits will be sacrificed at either 14 days or 30 days for histologic analysis. 3) Groups of rabbits will be tested one at a time, starting with the 100 mg/ml dose and a 14-day timepoint. If toxicity is demonstrated, the 50 mg/ml dose will be tried. If there is no toxicity, the 100 mg/ml dose will be tried at the 30-day timepoint to look for delayed toxic effects. The highest non-toxic dose will be identified. 30-day histologic analysis will be conducted at the highest non-toxic dose. 4) The following parameters for toxicity will be measured at baseline and at specific time points: i) electroretinography: 7 days, 21 days ii) pachymetry: 2 days, 8 days, 22 days iii) intraocular pressure measurements: 1 day, 7 days, 21 days iv) anterior segment exam/imaging: 2 days, 8 days, 22 days v) fundus photography: 2 days, 8 days, 22 days vi) histology analysis: 14 days, 30 days 7) Similar experiments will be done using an intravitreal injection of 1400W with doses of 5, 25, and 50 mg/ml.
Chan Nguyen	Ophthalmology	Nitric oxide inhibition as a strategy for the treatment of diabetic retinopathy	Intravitreal injection of inducible nitric oxide synthase (iNOS) inhibitors is not toxic and could serve as a potential therapy for diabetic retinopathy. Specific Aims: Determine the intravitreal toxicity of two iNOS inhibitors: aminoguanidine and 1400W. Intravitreal toxicity studies have classically been performed in rabbits because of their similarity to human eyes and the ease with which ocular examinations can be conducted.

Matthew Petroll	Ophthalmology	Inhibition of Corneal Scarring in Animal Models of Refractive Surgery	Our Hypothesis is that during in vivo wound healing, Rho kinase plays a pivotal role in the transformation from a quiescent-dendritiform keratocyte migration mechanism to a collective-fibroblastic migratory phenotype, which is associated with increased cell and matrix light scattering (loss of transparency). By using in vivo confocal imaging and immunocytochemistry to correlate cell morphology, connectivity and backscattering with expression of fibroblast and myofibroblast markers after lamellar keratectomy in the rabbit, we will determine whether these responses can be modulated by inhibiting Rho kinase (using Y-27632). In other words, we will investigate whether Y-27632 can inhibit fibroblastic transformation of corneal keratocytes during in vivo wound healing.
Baochan Nguyen	Ophthalmology	Determining the Benefit of Retinal Neovascularization in iNOS-null Mice in the Oxygen-Induced Retinopathy (OIR) Model	That retinal neovascularization is not harmful and may, in fact, have positive outcomes. Three specific experiments will be performed to test this Hypothesis using iNOS-deficient mice in the OIR model. Mice are placed in a 75% oxygen environment on postnatal day 7 (P7) for 5 days, which induces retinopathy.
Danielle Robertson	Ophthalmology	Microvolume Assay Sensitivity in Quantifying IGF-1 and Insulin in Normal Human Tears	Our specific aims are to: (1) Assess the sensitivity and repeatability of the MVM assay for the quantification of IGF-1 and insulin in normal human tears; (2) Assess the effects of diurnal variation and inter-visit variability on tear composition.
Danielle Robertson	Ophthalmology	The Role of P. Aeruginosa in Contact-Lens Related Microbial Keratitis	We will test these hypotheses with the following experimental aims: (1) Compare the capacity of cytotoxic and invasive strains of P. aeruginosa to utilize cellular debris scaffolds formed by dying neutrophils to accelerate colonization on contact lens surfaces. (2) Characterize the capacity of a panel of standard FDA test strains to colonize lens surfaces in the presence of accumulated cellular debris.
Danielle Robertson	Ophthalmology 9057	Developing a model for testing efficacy of contact lens cleaning solutions	We hypothesize that A) in the absence of adequate tear clearance, robust subclinical inflammation in the lens-wearing eye promotes microbial colonization during soft lens wear. Furthermore, we hypothesize that B) currently available chemically-preserved and peroxide-based lens care products exhibit reduced disinfection efficacy against bacterial and fungal isolates following exposure to neutrophils during lens wear. Lastly, we hypothesize that C) ineffective solution disinfection results in enhanced microbial colonization of the contact lens case. Specific Aim 1: Evaluate the capacity of bacteria/fungi to colonize contact lens surfaces during lens wear in the rabbit eye in vivo. We will incubate lenses with a predetermined inoculum (either bacterial or fungal) for 2 hours. Bacterial/fungal laden lenses will then be placed on the rabbit eye for approximately 6 hours of wear. Lenses will be removed and assessed for colonization by standard plate counts and laser scanning confocal microscopy. Specific Aim 2: Develop a novel, real world model for testing efficacy of contact lens cleaning solutions. We will perform (Aim 1) above, but then proceed to disinfect

			the lens overnight using a variety of market-available solutions according to their manufacturer guidelines. The lenses will then be reassessed the following day for colonization using same methods as above, quantifying each solution's efficacy in decreasing colony size and number and comparing this to manufacturer-reported values. Specific Aim 3: Determine the rate of inoculum transfer from the lens to the lens case in the absence of adequate disinfection. We will perform (Aim 1) above and then place the bacterial/fungal lenses in a lens case with appropriate disinfection solution containing Dey-Engley broth to neutralize the biocide. Contamination levels will be assessed using crystal violet staining and/or standard plate counts to determine the rate of transfer of the microbes to the lens case.
Michael Huo	Orthopedic Surgery	A Markov Analysis of the Economic Cost and Benefit of Revision of Total Hip Replacement in The Elderly Patients	A Markov Analysis may very well demonstrate that the economic cost burden would outweigh the potential economic benefit of revision total joint replacement (TJR) surgeries in the elderly. We however hypothesize that the economic loss will be overshadowed by the improvements to the patient's quality of life.
Chris Chen	Orthopedic Surgery	The Role of Corticosteroids in Rotator Cuff Repair	Hypothesis: The treatment of corticosteroid in torn rotator cuff will decrease synovial inflammation and reduce biomechanical strength of repaired rotator cuff.
Harry Kim	Orthopedic Surgery	Effects of Surgically Implanted Trans-physeal Screw on Proximal Femoral Growth and Angulation: Experimental Investigation in Immature Pigs	We hypothesize that an asymmetrically placed transphyseal screw will serve as a tether and decrease the growth of the growth plate on the same side of the screw application producing an angular effect. In other words, a laterally placed screw in the secondary ossification center will have a valgus effect while a medially placed screw in secondary ossification center will have a varus effect.
Michael Khazzam	Orthopedics	Comparing the Effects of NSAID Anti-Inflammatory and Corticosteroid Injections on Outcomes for Shoulder Pathologies	Hypothesis: We are seeking to compare the effects of corticosteroid and NSAID injections for several different shoulder pathologies on pain relief and improvement of mobility. Based on anecdotal evidence and the small number of published studies in the literature, it is expected that NSAID injections will reduce pain levels for patients to a level comparable to corticosteroid use and that these pain-relief effects will last longer than those induced by corticosteroids. It is also expected that these results can be achieved without the adverse degenerative effects associated with corticosteroid injections. Specific Aims: 1. To determine the efficacy of NSAID injection use on pain relief and mobility improvement for a range of shoulder pathologies. 2. To compare the patient outcomes for those receiving NSAID injections to those receiving corticosteroid injections and determine, for each shoulder pathology, which results in the most favorable outcomes. 3. [This aim would be pursued after the summer research period, as I expect to continue involvement on this project beyond the summer] Once the clinical portion of the project has yielded sufficient evidence, to utilize an animal model of each shoulder

			pathology and study the tissue changes (i.e. degeneration of muscle and connective tissue) that accompany the use of each injection type. It is expected that this investigation will confirm our findings in the clinical portion (i.e. more degenerative changes in the animal model will correlate to poorer clinical outcomes).
Ted Mau	Otolaryngology - Head and Neck Surgery	3D Cell Culture of Human Vocal Fold Fibroblasts in A Novel Bioengineered Tissue Scaffold	There is an optimal concentration ratio of ECM to HA at which cell viability, proliferation, and protein production are maximal. Specific Aims (Student Responsibilities): 1. I will generate 3D cell cultures using ECM-HA gel containing different ratios of ECM and HA. 2. I will quantify cell viability in the 3D cell culture. 3. I will measure cellular proliferation using a variety of assays 4. I will measure production of collagen and HA in the 3D cell culture. Study Design: The study design centers around the use of 3D cell culture with various growth assays.
Kenneth Lee	Otolaryngology/Head & Neck Surgery	Development of a novel atraumatic cochlear implant array with shape memory polymer technology	1) Self-coiling shape memory polymer cochlear implants will hug the modiolus after atraumatic insertion. 2) Full photolithographically defined devices will lead to greater consistency across devices and reduce manufacturing costs. 3) Higher electrochemical surface area carbon nanotube electrodes, with improved charge injection capacities will enable increased numbers of smaller electrodes which could lead to additional addressable frequencies, improved signal fidelity and higher functionality devices.
Rene Galindo	Pathology	Rhabdomyosarcoma Immunohistochemistry and Xenograft Studies	Hypothesis: IHC: We expect both PAX-FOXO1-positive (A-RMS) and PAX-FOXO1-negative (E-RMS) to express up-regulated TBX1 level and standard TBX1 levels in normal tissue. Xenograft: We expect that tumors associated with the head and neck region (RMS regions) will express up-regulated TBX1 levels.
James Malter	Pathology	Assessing stability of protein Pin1 with respect to phosphorylation state	Prolyl isomerase Pin1 is subject to degradation via specific E3 ligase mediated ubiquitination. Pin1 is expressed in lung fibroblasts and plays an integral role in asthma development and healing. It also has an inflammatory, anti-apoptotic role in eosinophils. Using newly bred pin1 knockout mice, the role of Pin1 in asthma and inflammation in vivo can be determined. Gross dissection of lungs as well as Western blot analysis of various protein content will elucidate this role.
James Malter	Pathology	Assessing lung remodeling in disease and inflammatory states in the absence of Pin1	We hypothesize that if Pin1 is absent, there will be under-expression of inflammatory pathway signals, thereby reducing the activity of TGF-beta1 and other tissue remodeling proteins with respect to both inflammatory and disease state models.
Joseph Forbess	Pediatric Cardiothoracic Surgery	Optimizing Drug Loading Efficiency and Drug Release with PPF-PDLGA Nanoparticles	My project for this summer is to optimize drug loading efficiency and drug release using PPF-PDLGA nanoparticles by testing different PPF-PDLGA ratios with a fixed amount of dexamethasone.
Daniel Bowers	Pediatric Hematology - Oncology	Role of Gut Microbiota in the Development of	Aim 1. To identify a gut microbiota signature that correlates with metabolic syndrome in pediatric cancer survivors We will collect fecal specimens from

		Metabolic Syndrome in Pediatric Cancer Survivors	leukemia and brain tumor survivors +/- MS and from siblings of cancer survivors with MS to control for environment and diet (6 groups, goal of n=8 for each group). Aim 2. To identify clinical and biological biomarkers that correlate with metabolic syndrome in pediatric cancer survivors Clinical (including dietary surveys) and biological biomarker (leptin, cytokines) data will be collected.
Juan Pascual	Pediatric Neurology	Evaluating cortex microcircuit activity in pyruvate dehydrogenase deficient mice	A lack of PDH leads to net increase in cortex microcircuit activity. Specific Aim: To evaluate the effect of PDH deletion on brain microcircuit activity in mice. The somatosensory cortex consists of stereotypical clusters of microcircuits containing excitatory and inhibitory neurons. Sampling net action potential activity in a microcircuit can be considered representative of sensory cortex activity.
Ron Mitchell	Pediatric Otolaryngology	Demographic status and measures of sleep dysfunction in the pediatric population: a retrospective analysis	Our study will explore how polysomnographic data varies with demographic in the pediatric population. We hypothesize that the apnea hypopnea index (a measure of sleep dysfunction) will be positively correlated with obesity, male gender, and African American race. We will also explore possible differences in sleep dysfunction between older and younger children. We hypothesize that the apnea hypopnea index (AHI) will be increased in older children compared to younger children.
Adam Alder	Pediatric Surgery	Port placement in the Pediatric Leukemia Patient	We aim to review pediatric acute leukemia cases from January 2000 to November 2010 to identify and characterize short term complications and long term complications. Short term complications are those that arise during surgical implantation of the device and include, but are not specific to, bleeding, air embolism, pneumothorax, and injury to vein. Long term complications include wire malfunction, clotting, bleeding, infection, treatment delays. We hypothesize there are differences in short and long term complications between children diagnosed with acute myeloid vs acute lymphoblastic leukemia. We believe that there are differences in overall survival, disease survival, and rates of remission between pediatric acute myeloid and lymphoblastic leukemia patients and that these differences can be partly attributed to the aforementioned complications from the central venous catheter with subcutaneous port.
James Amatruda	Pediatrics, Internal Medicine, Molecular Biology	Let-7 Targets in Wilms' Tumors	The gene expression of one or more oncogenes of interest (KRAS, HMGA2, MYC, MYCN, IGF2BP1) will show increased expression in Dicer/Drosha Wilms' tumors compared to wild type Wilms' tumors, owing to low let-7 levels in these tumors. Study Design: • cDNA will be made from eleven Wilms' tumor RNA samples. Three of these samples will be Drosha mutants and two will be Dicer mutants. • qPCR primers will be designed and validated for KRAS, HMGA2, MYC, MYCN and IGF2BP1. • qPCR will be run for each cDNA sample using each of the five primers. • The relative expression of each gene will be compared between the different tumors. • Inverse relationships between let-7 expression and oncogene expression will be noted for further investigation. • Follow-up studies will include immunoblots to validate qPCR results, and testing the effect of let-7 mimics on expression of target genes.

Elisabeth Martinez	Pharmacology/Hamon Center for Therapeutic Oncology Research	Overcoming lung cancer drug resistance using an inhibitor of Jumonji histone demethylases	Hypothesis and Specific aims: Jumonji demethylases have been found upregulated in drug resistant lung cancers and their genetic deletion re-sensitizes cells to standard therapies. JIB-04 has been identified by the Martinez lab as an inhibitor of this class of enzymes, thus it is our Hypothesis that JIB-04 could prevent human lung cancer cells from becoming drug resistant as well as potentially reverse acquired or intrinsic resistance of lung cancer cells to chemotherapies or particular targeted therapies. The specific aims of this project are: 1. To evaluate JIB-04 for its ability to prevent acquired drug resistance of human lung cancer cells to standard chemotherapy or targeted therapy. 2. To test if JIB-04 can reverse acquired or intrinsic drug resistance of human lung cancer cells to standard chemotherapy or targeted therapy.
Robin Hiesinger	Physiology	Investigating the function of mutant Rab7 proteins involved in Charcot-Marie-Tooth 2B.	The next step in this research is to confirm how much and what part of wild-type function the mutant CMT2B proteins retain in a null-rab7 Drosophila line. We hypothesize that the CMT2B proteins exhibit impaired recruitment to the late endosomes, but that they readily convert the late endosomes into lysosomes once they are recruited to the endosome, as a wild-type Rab7 protein does.
Jeffrey Kenkel and Kathryn Davis	Plastic Surgery	Radio Frequency Pilot Study: The Use of Radio Frequency Technology in Tissue Tightening and Body Contouring	We hypothesize that an optimum dose will be dependent on both the energy of RF applied and the treatment time. We also hypothesize that this optimum dose may be affected by patient characteristics. This pilot study will be important for designing more comprehensive clinical studies to further direct the use of this device in clinical practice.
Jeffrey Kenkel and Kathryn Davis	Plastic Surgery	The role of ERα expression in donor tissue and the effect of circulating estrogens on fat graft outcomes in vivo	We hypothesize that, similar to what we demonstrated in our preliminary data, circulating estrogens in WT donors and recipients will improve fat graft outcomes by increasing vascular density and adipocyte viability in the newly formed fat graft. Conversely, we hypothesize that depleting of circulating estrogens in WT donors and recipients will result in a larger, more fibrotic fat graft with fewer viable adipocytes. We also hypothesize that the estrogen-mediated effects shown in our preliminary data are the result of estrogens signaling through ERα. Further, in the absence of ERα expression (in the αERKOs), circulating estrogens will result in less desirable fat graft outcomes.
Carol Tamminga	Psychiatry	Developing Biological Correlates of Poor Psychosocial Function in Psychosis	We hypothesize that by testing the Birchwood Social Functioning Scale outcomes across the psychosis dimension in the 933 probands with the three main psychosis diagnoses (schizophrenia, schizoaffective disorder, and psychotic bipolar I disorder) and examining associations between these social function outcomes with the biological markers such as cognitive measures, resting state EEG, and/or brain activity captured with fMRI we will find biological correlates of social function that will better elucidate the physiological basis for this key clinical outcome in individuals with schizophrenia.
Sherwood Brown	Psychiatry	Identifying regional brain volume changes in	Based on the available literature and potential etiologies we hypothesize that there will there be specific brain volume differences in the hippocampus, anterior cingulate

		asthma patients	cortex, and insula in asthma patients as compared to those without asthma. Specific Aims: -Determine whether asthma participants demonstrate regional brain volume differences as compared to participants without asthma -Explore whether regional brain volume differences in asthma patients are related to co-occurring depression or corticosteroid use -Determine whether regional brain volume differences in asthma patients are associated with performance on a cognitive task
Brian Adinoff	Psychiatry	Secondary Analysis of 'Impulsivity, Neural Deficits, and Relapse in Cocaine Addiction'	The relationship between BOLD response in selected regions of interest (ROIs) relevant to disinhibition and self-report measures of impulsivity will be altered in cocaine-dependent participants relative to healthy controls.
Nathan Kim	Radiation Oncology	Overcoming Radiation Resistance in Renal Cell Carcinoma	Purpose: 1. To evaluate patient experience using radiation therapy for primary and metastatic renal cell carcinoma at UT Southwestern. 2. To determine molecular mechanisms of radiation resistance from tumor grafts of renal cell carcinoma by bridging laboratory data with clinical and genomic information of the patient and patient TG.
Asal Rahimi	Radiation Oncology	The effect of post-mastectomy radiation therapy with neoadjuvant chemotherapy and mastectomy on patients with clinically staged T3N0 breast cancer	The Hypothesis then is that those patients with clinically staged T3N0 disease who receive both NAC and PMRT with mastectomy will have a lower LRR rate compared to those that don't have PMRT.
Neil Rofsky	Radiology	Implementation of a Principal Component Analysis plugin for OsiriX	A tool based on principal component analysis (PCA) can offer an objective and reproducible method for post-processing dynamic contrast-enhanced (DCE) images. In the past, PCA, when adjusted to correlate with physiological parameters, has been shown to provide insight into the pathology of prostate cancer [3]. Combining PCA with an MRI image reading platform like OsiriX [6] would result in a tool that allows physicians to noninvasively detect and monitor the disease in a more reliable and intuitive manner. Specific Aims We aim to develop a user-friendly implementation of Principal Component Analysis to enhance analysis of MRI of the prostate, more specifically DCE imaging data. We will use the Osirix platform to achieve our goal, and the completed software will be released as an Osirix plugin made freely available to other researchers and clinicians. Future studies validating PCA accuracy and reliability for the detection and characterization of prostate cancer can leverage the interface developed in this project, and will be pursued if time allows.
Kevin King	Radiology	The Role of Cardiovascular Insults on Aging Changes in Brain Structure and Vascular Function and	Recent studies have suggested that cognitive impairment with aging likely involves cardiovascular insults that impact the brain and its vascular tissues. The Hypothesis for this project is that aortic stiffening and the small vessel damage that results in the brain contributes to this cognitive decline seen in many illnesses, including Alzheimer's disease. The goal of this project is to link this aortic stiffening to the

		Their Clinical Outcomes	small vessel damage in the brain that can eventually result in or lower the threshold for cognitive impairment.
Steven Wolf,	Surgery	The effect of UBM in muscle regeneration and function recovery in animal models with laceration injury	The Hypothesis of the study is that IGF-1 has an additive effect on muscle regeneration combined with UBM treatment after muscle injury. In a previous study we did not see significant muscle function improvement after 60 ays in a mouse model of large volumetric loss (75%) with UBM treatment. We speculate that the period of time was not long enough to observe benefit, or that the injury was too large to have any effect.
Steven Wolf	Surgery	KMAC and Resuscitation in Burned Children	Severely burned children respond differently to resuscitation and treatment than severely burned adults in terms of outcomes. We expect to find significant difference in age groups that is directly related to outcomes. Further, we expect to find differences in KMAC curve trajectories with better responses early in the resuscitation phase. We also expect to find patterns of changes depending on the point of recovery from injury that might predict poorer outcomes.
Steven Wolf	Surgery	Porcine derived extracellular matrix (UBM) in regulating myoblast proliferation via AKT/mTOR pathway: an in vitro mechanistic study	Aim 1 is to investigate whether UBM treatment affects myoblast turnover (cell proliferation and cell death). Aim 2 is to investigate whether UBM regulates myoblast proliferation and differentiation through changes in the AKT/mTOR pathway. Finally, Aim 3 is to investigate whether UBM has protective effect on differentiated myotube in addition to undifferentiated myoblasts in vitro. A murine skeletal myoblast cell line C2C12 will be used for this project. Cells will be cultured with and without UBM treatment for 6, 12, 24, 48, 72 hours. A time course and dose of UBM will be tested for Aim 1. Sample analysis will be through molecular biology techniques such as protein/RNA extraction, western blot and qPCR etc. Myocyte morphology will be examined under light microscope.
Jodi Jones	Surgery	Using Sonographic Optic Nerve Sheath Diameter (ONSD) Measurements to Estimate Intracranial Pressure (ICP)	Increase in intracranial pressure is a life threatening situation and will be transmitted to the space surrounding the optic nerve via the subarachnoid space.1 This communication should induce changes in the diameter of the sheath that encapsulates the nerve and subarachnoid space. We propose that measurements of the ONSD be taken, 3mm posterior to papilla, with a linear probe on the ultrasound device as a method for intracranial pressure measurement or estimation. This bedside procedure is non-invasive and can be deployed quicker than standard methods of measuring intracranial pressure.
Sergio Huerta	Surgery	Effects of BMI in patients receiving a total abdominal colectomy: effect of the microbiota	1. The primary goal of this study is to determine the effect of a Total Abdominal Colectomy on long term Body-Mass Index (BMI) defined as 24 months post-operative BMI. We hypothesize that patients who have a Total Abdominal Colectomy will have a substantial change in long term BMI as the microbiota has been radically altered.
Joseph Murphy	Surgery, Pediatrics	Video Assisted Thorascopic Surgery (VATS) vs. Bronchopulmonary Lavage for Diagnosis of	We propose to identify and investigate pediatric patients with neutropenic pulmonary infection requiring an invasive diagnostic technique (BAL vs. VATS) through examination of the Oncology Registry at Children's Medical Center Dallas. We will assess the incidence, precipitating factors, immediate morbidity, and involvement of appropriate physicians, diagnostic techniques, subsequent therapies and long-term

		Neutropenic Fungal Disease	outcomes of video assisted thorascopic (VATS) vs. bronchopulmonary lavage for diagnosis of neutropenic fungal disease.
Steven Wolf,	Surgery: Division of Burns/Trauma/Critical Care	Propranolol Dosing in Severely Burned Adults	Severely burned patients are affected with the hypermetabolic state, with energy expenditure often exceeding twice normal levels; this condition lasts for months. Some of this response is associated with hypercatecholaminaemia for which both alpha and beta adrenergic receptor blockade has been investigated. Our Hypothesis is that significant variability in dosing and response is present in severely burned adults receiving propranolol.
Philippe Zimmern	Urology	Cystocele repair	In this study, we will 1. determine the long term outcome of symptomatic non-neurogenic women with Stage 2 or more cystocele, and 2. compare the outcomes between those who underwent a primary cystocele repair versus those who failed a prior repair and needed a secondary procedure.