# 2019 Clinical and Translational Research Funding Program Awardees

| Funding Source | Principal Investigator | Dept/Division | Project Period | Proposal Title | Description |
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| FBJH | Peg Allen, PhD | Brown School: Prevention Research Center | 3/1/19-2/29/20 | Review of Measures of Policy Implementation Predictors and Outcomes | In public health and clinical practice, evidence has increased in recent decades identifying policies that facilitate health-promoting environments and behaviors and improve health of populations, but less is known about best ways to implement, evaluate and sustain such policies. The purpose of this project is to find, catalogue, and publicize measures of what influences policy implementation in health. |
| ICTS and SLU | Elizabeth Baker, PhD, MPH | SLU: College for Public Health and Social Justice: Behavioral Science & Health Education | 3/1/19-2/29/20 | Community Oriented Approach to Lupus Support (COALS) | Social support is a critical determinant of health outcomes for individuals living with systemic lupus erythematosus (SLE). Using principles of community engagement we will work with patients and others to develop an intervention to enhance SLE patients' capacity to manage ambiguity and access support. |
| ICTS | Dennis Barbour, MD, PhD | Biomedical Engineering | 3/1/19-2/29/20 | Optimal Clinical Change Detection | Clinical diagnostic tests always take the same form, regardless how much is already known about the patient or how many previous tests they have had. This wastes time and other resources. We will validate a new machine learning tool designed to perform incremental testing of hearing ability instead of absolute testing. Regular repeat testing for at-risk populations will require dramatically less time with this more sensitive diagnostic tool. |
| ICTS | Hong Chen, PhD | Biomedical Engineering | 3/1/19-2/29/20 | Focused Ultrasound-enabled Brain Tumor Liquid Biopsy: Detecting Brain Cancer Without a Knife | We developed a novel technique – focused ultrasound-enabled brain tumor liquid biopsies – for noninvasive, localized, and safe brain tumor biopsies. This study will assess the potential of this technique for clinical translation using a porcine model of the brain tumor. Data that will be obtained from this study will be used to support the investigational device exemption application to the FDA to start a clinical trial. |
| FBJH | Christine Chu, MD | Obstetrics and Gynecology | 3/1/19-2/29/20 | Methenamine Hippurate in a Nonantibiotic Prophylaxis Regimen for Recurrent UTI Management: Implications for Urinary Bladder Inflammation, Tissue Repair, and Microbiome | This purpose of this project is to examine the impact of methenamine hippurate, a useful but often overlooked medication for prevention of urinary tract infections (UTIs), on bladder factors that can impact recurrent UTIs (rUTIs). |
| ICTS and MU | Kevin Everett, PhD | MU, Medicine: Family & Community Medicine | 3/1/19-2/29/20 | Identifying Factors that Impact Implementation of Tobacco Use Treatment in Healthcare Settings | Tobacco use is the leading cause of preventable morbidity and mortality in the United States and a leading cause of healthcare utilization. Most healthcare systems provide inadequate treatment. This project examine the adoption potential of having a healthcare system's tobacco treatment program pay patients to quit smoking and determine how this approach could be implemented in a variety of hospital and clinic settings of a healthcare system. |
| ICTS | Daved Fremont, PhD | Pathology and Immunology | 3/1/19-2/29/20 | Genetic Profiling of the Immunologic Triggers of Molluscum Contagiosum Clearance | Molluscum contagiosum virus (MCV) infections can persist for months to years, with clearance of the disease often preceded by inflammation at the site of infection. We hypothesize that keratinocytes, the cell-type infected by MCV, are involved in driving the pro-inflammatory state by overcoming MCV immune-evasion. We will test this hypothesis by isolating lesion keratinocytes and performing RNAseq, comparing inflamed and non-inflamed MCV lesions. |

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| FBJH | Marcie Hayes, DPT | Physical Therapy | 3/1/19-2/29/20 | Movement System Impairments in Patients with Lower Urinary Tract Symptoms | An estimated 75% of women experience lower urinary tract symptoms (LUTS) such as urgency and frequency. Physical therapy to improve movement system impairments, i.e. muscle weakness and decreased excursion, shows promise in patients with LUTS and may reduce the need for medication and invasive procedures. Ultimately, this line of investigation will lead to novel treatment strategies to improve symptoms and quality of life in patients with LUTS. |
| FBJH | Ali Javaheri, MD, PhD | Department of Medicine: Cardiovascular Division | 3/1/19-2/29/20 | Apolipoprotein M Regulates Cholesterol Efflux to Promote Survival After Cardiac Transplantation | After cardiac transplantation, ischemia-reperfusion injury contributes to acute graft dysfunction and chronic cardiac allograft vasculopathy, a major cause of mortality. The proposal focuses on understanding the link between high-density lipoprotein function and composition and post-transplant coronary artery disease and survival in humans and mice, with the ultimate goal of developing therapeutics in transplantation. |
| FBJH | Tanner Johanns, MD, PhD | Department of Medicine: Medical Oncology | 3/1/19-2/29/20 | Use of in vivo DBSI to Guide Treatment Decisions in Patients with CNS Malignancies | This proposal aims to use a readily-available, non-invasive imaging modality to distinguish various histologic tumor regions in patients with brain cancer. The results have broad implications in guiding treatment decisions, from surgical planning to post-treatment surveillance. Specifically, we aim to determine if this novel imaging tool can distinguish post-radiation pseudoprogression from true tumor progression, a major unmet clinical need. |
| ICTS and MU | Julie Kapp, PhD | MU: Health & Management & Informatics | 3/1/19-2/29/20 | Developing an Intervention to Mitigate Obesity Risk in a Child's First 1,000 Days | The United States has some of the highest obesity and diabetes rates in the world. Risk factors for obesity can appear as early as a child's first 1,000 days. During our ongoing collaboration with our community partner Parents as Teachers (PAT), we identified the need for interventions to address this risk. Working with PAT, we will develop an intervention to improve obesity-related risk factors in a child's first 1,000 days. |
| ICTS | Alfred Kim, MD, PhD | Department of Medicine: Rheumatology | 3/1/19-2/29/20 | Complement Activation Signatures in Systemic Lupus Erythematosus | Systemic lupus erythematosus (SLE) is an autoimmune disease that causes inflammatory damage to multiple organs. Both B cells and complement system activation contribute to SLE flares, the relationship between the two is unclear. Using mass cytometry, we seek to characterize which complement activation markers are found on B cells from SLE patients and how this drives the generation of dysfunctional B cells. |
| FBJH | Chang Liu, MD, PhD | Pathology and Immunology | 3/1/19-2/29/20 | Targeting Antigen-specific B Cells by HLA-Fc Fusion Protein for Antibodymediated Rejection | Antibody-mediated rejection is a leading risk factor for graft loss after life-saving transplantations. Antibodies to human leukocyte antigen (HLA) are the main culprit, yet no current therapy offers both efficacy and specificity. We propose a novel strategy to remove donor-specific B cells with HLA-Fc fusion proteins selectively. The pilot experiments aim to demonstrate the specificity and efficacy of candidate proteins in vitro and in vivo. |
| ICTS and SLU | Jianguo Liu, MD, PhD | SLU: Medicine | 3/1/19-2/29/20 | Role of RNA-binding Protein MCPIP1 in Human TB Immune Evasion | Tuberculosis (TB) remains a leading global health problem and the persistence of Mycobacterium tuberculosis (Mtb) infection is mediated by suppression of host immunity. The mechanisms of immune suppression by Mtb, however, are still poorly understood. Our preliminary data indicate that a new RNA-binding protein, monocyte chemotactic protein-induce protein 1 (MCPIP1) is such a protein that it is induced by M. tuberculosis for immune evasion. |

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| ICTS | Esther Jiaxin Lu, PhD | Surgery: Public Health Sciences | 3/1/19-2/29/20 | Sample Size Considerations and Proposed Statistical Methods in Stepped Wedge Design | A stepped wedge design (SWD) is a type of crossover design in which the clusters cross over from control to intervention at a certain time point. We develop two generalized estimating equation models for continuous outcomes with the assumption of the nested exchangeable correlation structure, one for closed cohort and the other for repeated cross-section SWDs. The study aims to provide a guideline for sample size calculation and analysis method. |
| ICTS and SLU | Andrew Nguyen, PhD | SLU: Medicine | 3/1/19-2/29/20 | Testing of Antisense Oligonucleotide based Therapeutic Approach for Frontotemporal Dementia in Mice | Progranulin nonsense mutations result in decreased progranulin levels and cause frontotemporal dementia (FTD), a devastating disease with no cure currently available. We have identified antisense oligonucleotides (ASOs) that increase progranulin levels in cells containing the R493X patient mutation. We propose to test these ASOs in the progranulin R493X mouse model to determine if they can prevent FTD-associated behavior changes and pathologies. |
| ICTS and MU | Jaume Padilla, PhD | MU: Nutrition and Exercise Physiology | 3/1/19-2/29/20 | TRAF3IP2 as a Novel Target to Restore Endothelial Insulin Sensitivity and Function in Type 2 Diabetes | Using a genetically-modified mouse model and isolated arteries from humans, this project examines the role of TRAF3IP2 in mediating vascular dysfunction in type 2 diabetes. |
| ICTS and MU | Charlotte Phillips, PhD | MU: Medicine | 3/1/19-2/29/20 | Therapeutic Potential of Myostatin (GDF8) and Activin A Inhibition on Murine Osteogenesis Imperfecta | Osteogenesis imperfecta (OI), or “brittle bone disease”, is a heritable disorder characterized by muscle weakness and skeletal fragility. There is no cure. Treatment is limited to surgical intervention and bone anti-resorptive drugs, with limited success. This pilot study will test the efficacy of two novel therapeutic agents (Regeneron Pharmaceuticals, Inc.) to improve muscle and bone mass and strength in two distinct mouse models of OI. |
| FBJH | Rachel Presti, MD, PhD | Department of Medicine: Infectious Diseases | 3/1/19-2/29/20 | Clinical and Microbiome Features Associated with Recurrent Urinary Tract Infection | Urinary tract infection (UTI) affects over 50% of women during their lifetimes, with a third experiencing recurrent UTI (rUTI). We propose to enroll women with and without rUTI and collect information and stool, urine and vaginal samples at baseline, at the time of rUTI and weekly for one month after rUTI. We will define changes in the microbiome that occur at these sites in order to better predict rUTI to develop better treatment strategies. |
| ICTS | Babak Razani, MD, PhD | Department of Medicine - Cardiovascular Division | 3/1/19-2/29/20 | Dissecting the Role of Dietary Protein on Monocyte/Macrophage mTOR Activation and its Impact on Cardiovascular Disease | Heart disease remains the leading cause of death in the United States. Recently high protein diets have become common place to manage weight loss. Long term impact of such diets remains unclear and may actually increase risk of heart disease. We propose to discern the mechanism of how dietary protein impacts human immune cells and cardiovascular risk. This work has the potential to uncover several new avenues for therapeutic intervention. |
| FBJH | Buck Rogers, PhD | Radiation Oncology | 3/1/19-2/29/20 | Development of a Novel Theragnostic Agent for Breast Cancer Imaging and Treatment | New therapies for breast cancer are needed. Recently, radioactive therapies have been approved by the FDA for the treatment of prostate cancer and neuroendocrine tumors. In this proposal, we will develop a radioactive agent that targets a cell surface marker on breast cancer and can be used for both non-invasive imaging and therapy. This will be the initial step toward the use of this agent for clinical breast cancer imaging and treatment. |
| FBJH | Hua Shen, PhD | Orthopaedic Surgery | 3/1/19-2/29/20 | Development of a Stem Cell-derived Cell-free Therapy for Tendon Injury | Tendon injury is one of the most common orthopaedic conditions and yet with today’s advanced surgical and rehabilitation techniques, operative repair of transected tendon does not consistently restore function. In light of the recent discovery of extracellular vesicles and their role in regulating inflammation, the proposed project aims to develop a stem cell-derived cell-free therapy with stem cell vesicles to improve tendon repair. |

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| ICTS | Christopher Smyser, MD, MSCI | Department of Neurology | 3/1/19-2/29/20 | Evaluating Effects Of HIE On Functional Brain Networks Using Optical Tomography | This study will establish diffuse optical tomography, a portable, light-based neuroimaging technique, as a valuable tool for evaluating functional brain networks at the bedside in the Neonatal Intensive Care Unit in infants with hypoxic-ischemic brain injury receiving whole body cooling. We will use this technology to study the effects of brain injury and develop imaging measures that can be used to guide treatment practices for affected infants. |
| FBJH | Kristine Wylie, PhD | Pediatrics: Infectious Diseases | 3/1/19-2/29/20 | Development of an Assay for Rapid Characterization of the Vaginal Microbiome in Pregnant Women | We study the microbes and their association with preterm birth (PTB). In this study we will create a single test that can simultaneously detect and quantify many microbes in clinical samples. The test will be faster and less expensive than the assays we currently use. We will use this test in our research studies of vaginal microbes and PTB, and it may serve as the foundation for future clinical assays aimed at defining risk for PTB. |
| ICTS | Todd Wylie | Pediatrics: Gastroenterology | 3/1/19-2/29/20 | Tools for Automated Interpretation of Viruses from Next-Generation Sequencing Data | We will focus on a major bottleneck in viral sequence interpretation that typically obligated extensive manual intervention, time, and computational resources. We propose to incorporate data from public resources into a custom database that will define key clinical viral phenotypes (e.g. subtype, drug resistance). We will develop complementary software tools to interpret viral signals from metagenomic sequence data. |
| ICTS and MU | Illhoi Yoo, PhD | MU: Medicine | 3/1/19-2/29/20 | Acute And Chronic Pain Management Using A Mobile Pain Monitoring System | We address pain problems through patient participation in pain management using mobile technologies. Our mobile pain management app can enable patients to efficiently and effectively participate in their pain management. This study is to develop a “medical grade” mobile pain monitoring system (mPMS) for acute and chronic pain management, and to perform pilot trials on pain monitoring for patients with acute pain or chronic pain using the mPMS. |

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| FBJH | Foluso Ademuyiwa MD, MPH | Department of Medicine: Oncology | 3/1/18-2/28/19 | Study of Molecular Analyses to Predict Disease Recurrence in Breast Cancer | The risk of the cancer returning is high for those triple negative breast cancer (TNBC) patients whose cancers are not eradicated by chemotherapy. Once the TNBC returns, it ultimately kills. We will study blood markers to identify those at high risk for recurrence. Our plan is to develop new ways to accurately determine which TNBC patients are at a high risk of relapsing, so that such patients may be treated differently and have better outcomes. |
| FBJH | Jeffrey Atkinson, MD | Department of Medicine: Pulmonary and Critical Care Medicine | 3/1/18-2/28/19 | Check Point Profiling with Mass Spectroscopy | Therapies that activate the immune system have been successful in treating lung cancer, however testing to determine who might benefit from these expensive and potentially toxic treatments are poor at predicting success. We have been evaluating a novel diagnostic technique that we will apply to small samples that are obtained during typical clinical procedures to diagnose all types of cancer and confirm it is a significant improvement. |

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| ICTS and MU | Lesa Beamer, PhD | MU: Biochemistry | 3/1/18-2/28/19 | Development of Therapeutics for Human Phosphoglucomutase 1 Deficiency | Inherited metabolic diseases arise from coding errors in a patient's genome, often resulting in non-functional proteins. These defective proteins may sometimes be "rescued" by binding to small molecules that help stabilize them. Here we propose to use automated screens of large libraries of diverse small molecules to identify such molecules for an enzyme called phosphoglucomutase 1. This protein is essential for glucose metabolism in humans. |
| FBJH | Carlos Bernal-Mizrachi, MD | Department of Medicine: Endocrinology, Metabolism and Lipid Research | 3/1/18-2/28/19 | Preventing the Development of Insulin Resistance and Hypertension | Past research suggests the environment during pregnancy can program immune cells to result in inflammation and risk for diabetes later in life. Vitamin D deficiency is common during pregnancy and linked to increased diabetes risk in the children born to these women. We will test whether vitamin D supplementation during pregnancy reduces diabetes risk and inflammation in children. |
| ICTS | Thomas Brett, PhD | Department of Medicine: Pulmonary and Critical Care Medicine | 3/1/18-2/28/19 | Modifying Transepithelial Cl- Transport in Primary Airway Cells from CF Patients | Nearly 2000 mutations in the *CFTR* gene may cause cystic fibrosis (CF), making drugs that target specific mutations, such as ivacaftor and lumacaftor, ineffective for most patients. We discovered a protein (CLCA1) that can selectively activate an alternate anion channel in the airway (TMEM16A), potentially a universal CF treatment strategy agnostic to the CFTR mutation. We will test the efficacy of this approach in airway cells from CF patients. |
| FBJH | Alison Cahill, MD, MSCI | Obstetrics & Gynecology | 3/1/18-2/28/19 | Impact of a Smartphone App on Breastfeeding & Weight Loss Among Low-Income Women | Breastfeeding increases postpartum weight loss. Low-income women are less likely to breastfeed and more likely obese. This is the first randomized controlled trial assessing how a smartphone app (Breast Feeding Friend (BFF) impacts breastfeeding and postpartum weight loss. 170 low-income women receiving standard care will be randomized into dummy app versus BFF. This study could change the paradigm of breastfeeding and weight loss interventions. |
| ICTS and SLU | Jen Jen Chang, PhD | SLU: Epidemiology | 3/1/18-2/28/19 | Promoting Healthy Sleep Health Among Families of Young Children: A Pilot Study | We will collaborate with a community partner that is a leader in the field in homebased parent education regarding child health and development to conduct formative research and develop an educational intervention that seeks to improve parental knowledge and practice of healthy sleep behaviors for their young children. |
| FBJH | Milan Chheda, MD | Department of Medicine: Oncology | 3/1/18-2/28/19 | Targeting Subpopulations of Glioblastoma Stem Cells to Improve Patient Survival | Most people die of glioblastoma within 2 years. A major problem in the field is that glioblastoma stem cells are resistant to our current therapies. Our work will use new technology to answer previously unanswerable questions about these stem cells: how they differ from other cancer cells, and how we can develop therapies that specifically target them. |
| ICTS and SLU | Govindaswami Chinnadurai, PhD | SLU: Molecular Microbiology & Immunology | 3/1/18-2/28/19 | Cell and Animal Models for Ctbp1-Mutated Neurodevelopmental Delays | Patients with a missense mutation in one allele of the CtBP1 gene exhibit developmental delays such as intellectual challenge and ataxia. We will generate a mouse model with the ctbp1 mutation and analyze the developmental defects associated with the mutation. We will also determine the alterations in gene expression and cellular pathways in patient-derived cells. These results will aid in the diagnosis and treatment of CtBP1-mutated syndrome. |
| FBJH | Brian Edelson, MD, PhD | Pathology & Immunology | 3/1/18-2/28/19 | Dissecting Multiple Sclerosis Pathogenesis at Single-Cell Resolution | Multiple sclerosis (MS) is a common and debilitating neurologic disease. In MS, immune cells from the blood traffic into the central nervous system (CNS) and cause damage. The features of these immune cells that result in disease are poorly understood. We will use a new technology, single-cell RNA-sequencing, to determine the precise mixture of immune cells that enter the CNS during MS. |

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| ICTS | Stefanie Geisler, MD | Neurology | 3/1/18-2/28/19 | Genetic Profiling of Patients with Idiopathic Small Fiber Neuropathy | Idiopathic small fiber neuropathy (iSFN) is a common and debilitating disease. We hypothesize that patients with iSFN harbor a genetic disposition that renders their axons vulnerable to degeneration. We will test this hypothesis by utilizing whole exome sequencing. To identify novel genetic risk factors and uncover gene sets previously unknown to be associated with iSFN, we will perform both candidate and unbiased analyses. |
| ICTS | Joseph Ippolito, MD, PhD | Radiology: Radiological Sciences | 3/1/18-2/28/19 | Metabolism-driven Modulation of Sex Differences in Gliomagenesis | Males are more likely to be diagnosed with cancer and also die from cancer compared to females. We have discovered one mechanism where male brain tumors have enhanced sugar metabolism compared to females. We are testing the effects of dietary sugar on sex-specific brain tumor growth in mice and will determine sex differences in response to diet using FDG-PET imaging. These techniques are immediately translatable to the clinical setting. |
| ICTS and SLU | Jacki Kornbluth, PhD | SLU: Pathology | 3/1/18-2/28/19 | Development of Natural Killer Cell Derived Exosomes as a Treatment for Cancer | Natural killer (NK) cells are a subpopulation of white blood cells that kill tumor cells. We developed a human NK cell line, NK3.3, that when activated, releases small membrane-bound vesicles, called exosomes. We found that these exosomes have potent anti-tumor activity but do not kill normal cells. The goal of these studies is to determine whether NK3.3-derived exosomes have the potential to be an “off-the-shelf” product for treatment of cancer. |
| FBJH | Jennie Kwon, DO, MSCI | Department of Medicine: Infectious Diseases | 3/1/18-2/28/19 | Longitudinal Analysis of the Microbiome of A New Medical Intensive Care Unit | The study goal is to identify the most feared “superbugs” from surfaces in a new intensive care unit. We will obtain samples from hospital surfaces over 1 year and culture them to detect superbugs. This data will help us understand how superbugs are transmitted in the hospital and help develop methods to prevent transmission from the environment to patients, ultimately improving patient safety and care. |
| FBJH | Arye Nehorai, PhD | Electrical and Systems Engineering | 3/1/18-2/28/19 | Modeling And Tracking of Freezing of Gait In Parkinson Disease | Freezing of gait (FOG) is considered the most disabling symptom of Parkinson disease. We propose to develop a personalized gait analysis system to automatically detect and track FOG in real-time using inertial sensors, and translate the developed methodology to patient application. The ability to detect an actual or impending FOG event has the potential to enable the development of novel intervention strategies for tackling this symptom. |
| FBJH | Margaret Olsen PhD, MPH | Department of Medicine: Infectious Diseases | 3/1/18-2/28/19 | Evolution of the Skin Microbiome in Women Undergoing Breast Reconstruction | Infection following mastectomy with implant reconstruction is common, resulting in prolonged antibiotic use after surgery. We will study the organisms found on breast skin of 30 women before and after implant reconstruction, to learn more about the source of bacteria causing these infections and the role of antibiotic therapy in selecting for antibiotic resistant organisms. |
| ICTS and SLU | Nermi Parrow, PhD | SLU: Pediatrics | 4/10/18-2/28/19 | Monoferric Transferrin Distribution in Chronic Kidney Disease | These studies will investigate whether the amount of iron contained in one of the two lobes of the major iron carrying molecule, transferrin, in blood is different in patients with chronic kidney disease or diabetes mellitus compared to healthy individuals and if such a difference influences the ability of molecules signaling the body to make more red blood cells, such as erythropoietin, to signal properly. |
| FBJH | Iskra Pusic MD, MSCI | Department of Medicine: Bone Marrow Transplant | 3/1/18-12/31/19 | A Pilot Study of Belimumab for Prevention of Chronic Graft-versus-Host Disease | Chronic Graft-versus-Host Disease (cGvHD) is an immune-mediated disorder occurring in 40-60% of allogeneic transplant recipients, involving both T- and B-cell pathology. Belimumab is a monoclonal antibody that inhibits the binding of B-cell activating factor to its receptors on B-cells, thus inhibiting B-cell survival. In this pilot and feasibility study we will assess tolerability and preliminary efficacy of belimumab for prophylaxis of cGvHD. |

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| ICTS and SLU | Terri Rebmann, PhD, RN, CIC, FAPIC | SLU: Epidemiology | 3/1/18-2/28/19 | Exposure and Preparedness for Natural and Man-Made Radiological Events | First responders could be exposed to radiation through natural causes (the West Lake Landfill) or terrorism. This study's primary purpose is to establish a baseline of how much radiation first responders are exposed to during routine duties. Another purpose is to ask first responders if they would be willing to work during a natural or manmade radiological disaster. This study could impact first responder safety and surge capacity in St. Louis. |
| FBJH | Christina Stallings, PhD | Molecular Microbiology | 3/1/18-2/28/19 | Development of New Antibiotics to Treat Tuberculosis | We will identify and develop new antibiotics to treat tuberculosis and other bacterial infections. |
| ICTS | Gregory Storch, MD | Pediatrics: Infectious Diseases | 3/1/18-2/28/19 | Improved Diagnosis of Fever in Neutropenic Children Using High Throughput Sequencing | Children who are receiving chemotherapy for treatment of leukemia or other childhood cancers periodically develop low white blood cell counts, often in association with fever. Clinicians are commonly unable to identify the cause of these fevers. In this study, we will use advanced molecular technologies to improve our ability to prevent, detect and treat these fever episodes. |

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| FBJH | Michael Avidan, MD | Anesthesiology | 6/1/17-5/31/18 | Anesthesiology Control Tower: Feasibility Assessment to Support Translation | We are developing an Anesthesiology Control Tower (ACT), modeled on an air traffic control tower for a busy airport, which will monitor patients undergoing surgery and provide support to their anesthesiologists. This study will identify possible barriers to the creation of this ACT and will ensure that the ACT is useful to the clinicians in our hospital. We anticipate that the ACT will enhance the care of patients and improve their outcomes. |
| ICTS | Dennis Barbour, MD, PhD | Biomedical Engineering | 7/1/17-6/30/18 | Smart Hearing Diagnostics | The most common test of hearing has been conducted the same way for decades. We are harnessing the power of modern machine learning in order to provide clinicians with more information about a patient's hearing in less time. This new smart test will not only directly benefit patients having their hearing tested, but will also serve as the foundation for more sophisticated future diagnostic tests not yet conceived. |
| FBJH | William Chapman, MD | Surgery: General | 6/1/17-5/31/18 | Prognostic Indicators of Liver Transplant Outcomes | Liver transplant is the only effective treatment for chronic liver diseases, but not enough organs are available. Currently, the decision to use and organ is based on clinical judgements, without the aid of proven tests. The goal of our project is to develop better tests to tell us how well an organ is likely to function after the transplantation. We expect that this will help surgeons utilize more livers and select better organs for transplantation. |
| FBJH | Camryn Chrisman Robbins, MD, MPH | Obstetrics & Gynecology | 6/1/17-11/30/18 | Novel Approach to Improving Lactation Support with Mobile Health Technology | This is a randomized trial of use of a mobile health tool (EpxBreastfeeding) aimed at improving breastfeeding adherence and duration among recent mothers who self identify as motivated to breastfeed. As a result of text communication and expedited coaching through common breastfeeding challenges, we expect more mothers in our study arm will continue breastfeeding through the first 6 months after giving birth. |

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| FBJH | Gregory Day, MD, MSc | Neurology | 6/1/17-5/31/18 | Improving Diagnosis Of Atypical Alzheimer Disease Using Tau-PET Imaging | Alzheimer disease (AD) may present with visual problems (progressive posterior cortical dysfunction), language difficulties (logopenic variant), or forgetfulness (amnestic AD). This study will use PET-imaging technology to measure AD brain changes in patients with different AD presentations. These findings will inform how AD brain changes cause specific symptoms, and will be used to improve the diagnosis of patients with early symptoms due to AD. |
| ICTS | Brian DeBosch, MD, PhD | Pediatrics: Gastroenter-ology | 7/1/17-6/30/18 | Hepatic Starvation Responses Induced by Trehalose in Mitigating Hepatic Steatosis | Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease, and a leading cause of cirrhosis. We defined the liver's fasting response as a target process to treat NAFLD, and we identified a drug, trehalose, that activates this response to reverse NAFLD. Our proposal defines the safety and mechanisms whereby trehalose exerts these effects in mice and human hepatocytes as a prelude to using trehalose in patients with NAFLD. |
| ICTS | Christopher Dy, MD, MPH | Orthopaedic Surgery | 7/1/17-6/30/18 | A Two State Comparison of Orthopedic Utilization Following Medicaid Expansion | Some states expanded their Medicaid programs under the Affordable Care Act. It is currently unknown whether this increase in people having Medicaid insurance actually resulted in easier and increased access to care. In order to answer this question, we will compare utilization of common orthopedic procedures before and after Medicaid expansion in Illinois, using Missouri as a comparison state since it did not expand its Medicaid program. |
| ICTS | Melanie Fields, MD, MSCI | Pediatrics: Hematology/ Oncology | 7/1/17-6/30/18 | Cerebral Oxygen Metabolism and Functional Connectivity in Sickle Cell Disease | Children with sickle cell disease face progressive cognitive decline. We will obtain MRI data and cognitive testing to understand differences in the networks of brain activity between children with sickle cell disease and healthy children, if an increase in metabolic stress in the brain affects networks of brain activity, and lastly if there is a relationship between metabolic stress in the brain, networks of brain activity and cognition. |
| ICTS | Jane Garbutt, MBCHB, MHS | Pediatrics: Allergy, Immunology and Pulmonary Medicine | 7/1/17-6/30/18 | Development of an Examroom-To-Newsroom Strategy to Enhance Firearm Safety | The risk of fatal and non-fatal firearm-related injuries and suicide for children and adolescents increases in homes where firearms are accessible. In this project we will develop messages about firearm safety and safe firearm storage that are acceptable to parents and healthcare providers. Future research will test if providers will use these messages and if parents respond by ensuring that firearms their child may access are safely stored. |
| FBJH | Cynthia Herrick, MD | Department of Medicine: Endocrinology, Metabolism and Lipid Research | 6/1/17-5/31/18 | Post-Partum Diabetes Screening Among Low Income Women with Gestational Diabetes | High blood sugar first discovered during pregnancy (gestational diabetes) substantially increases risk for type 2 diabetes later in life. We will use interviews and focus groups to 1) understand unique challenges that low income women face in getting screened for diabetes after pregnancy and 2) assess patient acceptance of proposed intervention(s) to improve screening for diabetes after pregnancy in this high risk population. |
| FBJH | Stacey House, MD, PhD | Department of Medicine: Emergency Medicine | 6/1/17-5/31/18 | Improving Heart Attack Diagnosis with Electrical Imaging | Every 43 seconds, an American suffers a heart attack. Unfortunately, 70% of heart attacks cannot be diagnosed immediately, leading to a delay in treatment. This project tests a novel method of diagnosing heart attacks by generating high-resolution, patient-specific electrical maps. We anticipate that this technique will permit more rapid heart attack diagnosis, more timely treatment and thus reduce morbidity and mortality. |

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| ICTS and MU | Trupti Joshi, PhD | MU: Health Mgmt & Informatics | 7/1/17-6/30/18 | Multi-Omics Informatics Methodologies for Biomarker Discovery in Endometriosis | Endometriosis is a common disorder encountered by many women, which is associated with chronic pain. This project aims at understanding the causes of endomtriosis by studying genomic samples from various groups on women with different disease stages and history. Informatics approaches to combine gene expression and methylation information will provide a better identification of biomarkers for early diagnosis and treatments. |
| FBJH | Shannon Lenze, PhD | Psychiatry | 6/1/17-5/31/18 | Improving Perinatal Depression Outcomes With Mobile Technology | Over half of women with pre- and postnatal depression go unrecognized and untreated. Mobile health technology can overcome barriers to screening and clinical management; however, there is little evidence to guide implementation. This project examines the feasibility and acceptability of mobile health technology for improving screening and management of prenatal depression in a low-income population at high risk for adverse health outcomes. |
| FBJH | Julie Margenthaler, MD | Surgery: General | 6/1/17-5/31/18 | Shave Margins In Breast Conservation Therapy (SMART) | Positive surgical margins after breast-conserving surgery for breast cancer significantly increase the risk of local recurrence. This pilot study will evaluate the feasibility of a randomized trial investigating the impact of cavity shave margins on the rate of positive margins, aesthetic outcomes, and quality of life. A novel goggle system using nearinfrared fluorescence will be implemented in all patients to assess margins intraoperatively. |
| FBJH | Scott Micek, PharmD | STLCOP: Pharmacy Practice | 6/1/17-5/31/18 | Antidiabetes Medication Utilization and Outcomes Following Bariatric Surgery | Careful adjustment of antidiabetes medications (ADM) after bariatric surgery is necessary to prevent adverse drug events that may occur with restoration of normal physiologic processes. This project seeks to identify ADM prescribing patterns after surgery and predictors for ADM cessation. This information will be used to determine how medication management following bariatric surgery influences the risk of drug-induced hypoglycemia. |
| ICTS | Muhammad Farooq Rai, DVM, MSCI, PhD | Orthopaedic Surgery | 7/1/17-6/30/18 | Novel Microgel Delivery Device for Sustained Release of PRP To Treat OA | Osteoarthritis is a debilitating joint disease that impacts 5.6 million people in the U.S. Available treatments focus mostly on pain alleviation. Our goal is to develop an injectable treatment of microspheres loaded with bioactive molecules called platelet rich plasma. We hypothesize that the sustained release of these molecules will modify inflammatory response, stop degeneration and initiate regeneration of cartilage, and restore joint health. |
| FBJH | Alex Ramsey, PhD | Psychiatry | 6/1/17-2/28/19 | Reducing Disparities in Hospital Prescribing of Smoking Cessation Pharmacotherapy | Despite knowledge of effective medications for smoking cessation treatment, fewer than 1 in 4 hospitalized patients who smoke are prescribed these medications. Our data also highlight potential racial disparities in prescribing smoking cessation medications, which motivates our stakeholder-driven approach to model and pilot test sustainable solutions to facilitate the implementation of smoking cessation treatment for all patients who smoke. |
| FBJH | Marilyn Schallom, PhD, RN | BJH: Patient Care Services | 6/1/17-11/30/18 | Measuring Bladder Volumes with Ultrasound and Bladder Scanning in the ICU | A urinary tract infection from a urinary catheter is a leading cause of healthcare-associated infection. An accurate measurement of bladder volumes in ICU patients is needed to remove urinary catheters sooner. The purpose of this study is to compare the accuracy of two non-invasive ways to measure bladder volumes. |
| ICTS and MU | Kamlendra Singh, PhD | MU: Molecular Microbiology and Immunology | 7/1/17-6/30/18 | Development of Extremely Potent Cross-Clade HIV-1 Reverse Transcriptase Inhibitor | More than 85% of HIV patients live in low- and middle-income countries (LMICs). Many patients in these countries cannot afford medication on a regular basis. Also, the medication has different effectiveness depending on HIV subtype. Hence, potent, broad-spectrum, long-lasting drugs are needed. EFdA has shown promise of fulfilling this need in early clinical trials. We will evaluate the effect of EFdA on HIV subtypes that are in LMICs. |

| Funding Source | Principal Investigator | Dept/Division | Project Period | Proposal Title | Description |
|---|---|---|---|---|---|
| ICTS | Christopher Sturgeon, PhD | Department of Medicine: Hematology | 7/1/17-6/30/18 | Characterization of Antitumor NK Cells Using Human Pluripotent Stem Cells | Natural killer (NK) cell infusion can cure some, but not all cancers. To understand why some patients respond to NK cells and others don't, we need a better understanding of NK cell biology. We propose to use human pluripotent stem cells as a unique source of NK cells to help us understand what renders some better or worse at destroying cancerous cells. We can then use this understanding in anticancer treatment strategies. |
| ICTS | Chad Sylvester, MD, PhD | Psychiatry | 7/1/17-6/30/18 | A Novel Mechanism-Based Treatment for Pediatric Anxiety Disorders. | Anxiety disorders are a common, impairing problem for many children. Unfortunately, even the best available treatments often do not work. This study tests a new treatment for anxiety disorders in children: a computer game that children play for 15 minutes at a time, twice per week, for 4 weeks. The computer game is designed to teach children to stay focused on their own goals and not be distracted by extraneous information. |
| ICTS and MU | Steven Van Doren, PhD | MU: Agriculture Biochemistry | 7/1/17-6/30/18 | Launching Diagnosis of Asthma In Children Using NMR Metabolomics | Asthma is very difficult to diagnose in young kids where it develops. A promising way to diagnose asthma will be evaluated first in adults, then in children, and finally in children at high risk of asthma. The promising approach relies on finding diagnostic patterns in a metabolic snapshot measureable in breath or blood. |
| ICTS | Qin Yang, MD, PhD | Radiation Oncology | 7/1/17-6/30/18 | Developing a Novel Reprogramming Strategy for Brain Tumor Treatment | Glioblastoma multiforme (GBM) is the most common malignant brain tumor and the outcome for patients is poor. We found mTOR and ROCK kinase inhibitors are sufficient to convert GBMs into neurons. Currently these inhibitors are used as anti-tumor drugs in patients and this method is easily to move to clinical trials. In this proposal, we will use these inhibitors to convert GBM cells into neurons in mice and develop a novel strategy to treat GBM. |
| ICTS | Melanie Yarbrough, PhD | Pathology and Immunology | 7/1/17-6/30/18 | Characterizing the Urobiome of MSM Using Enhanced Culture-Based Methods | Microbial communities protect humans from invading pathogens, such as those that cause UTI. The proposed research will identify novel pathogens responsible for UTI and characterize the role of the urinary microbiota in the protection against or predisposition to urogenital infections in MSM. These findings may increase our understanding of the development of urologic disease and improve diagnostic methods for the detection of uropathogens. |

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