



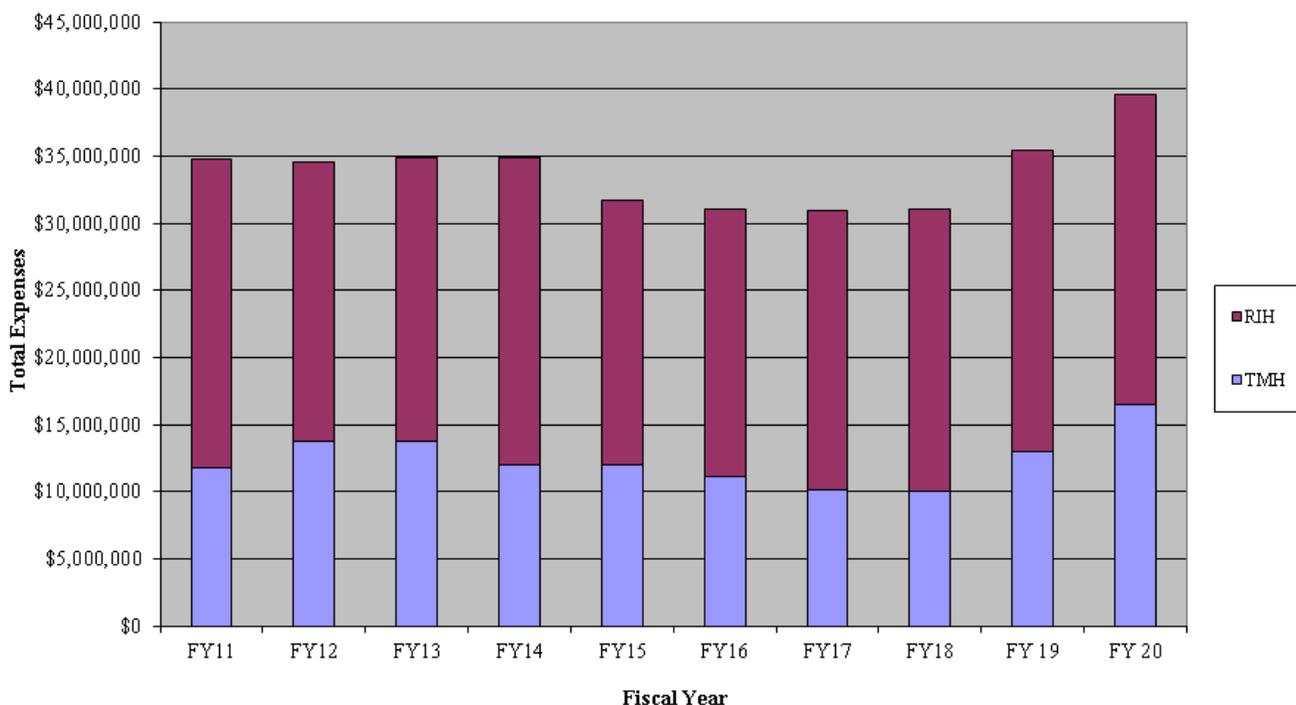
**Research Overview Fall 2021**

Brown University has long been regarded as a leader in all aspects of health care and teaching, including research. Leadership in the Department of Medicine including **Dr. Louis Rice**, Chairman for Medicine, and **Dr. Bharat Ramratnam**, Vice Chairman for Research in Medicine, strongly support research as part of the academic mission. Total research funding within the Department of Medicine at Brown affiliated hospitals (Rhode Island Hospital, Memorial Hospital of Rhode Island, Veterans Administration-Providence and The Miriam Hospital) increased by 12% in 2020 with funding of over \$39 million. Over 70% of funding comes from federal programs such as NIH, HRSA, CDC, and DHHS.

Laboratories are highlighted within the ‘Knowledge District’ in Providence. This enterprise involves key academic institutions including Brown University and Rhode Island Hospital. For Rhode Island Hospital, this includes a \$3 million laboratory construction of the Medical Oncology research program in the Coro facility, completed in 2012. Other programs in the Coro facility include the CardioVascular Research Center, the Genomics and Proteomics Center as well as the Lifespan Clinical Research Center (CRC).

The other major research facility for Lifespan in the Knowledge district is the Galletti Research Building, which houses the Liver Research Center and Infectious Disease laboratories. Brown University has expansive research at the Ship street and Elm street facilities as well as the Warren Alpert Medical School located in the area. Both basic and clinical research are well represented *(next page)*

**Research Growth FY11 - FY20**



in the Department. For basic research, major strengths include the **Medical Oncology and Stem Cell Research Program** (directed by Dr. Peter Quesenberry) and the **Cardiovascular Research Laboratory** (directed by Dr. Gideon Koren). Academic aspects to research include NIH funded T-32 Training grants in Infectious Diseases and Pulmonary/Critical Care. Our institution's goal of expanding all aspects of cancer research and clinical care is led by Wafik El-Deiry, MD, PhD, FACP who joined the Department of Medicine and Brown University. In his role as the director of the unified cancer biology program, Dr. El-Deiry will design, recruit, and lead the cancer biology programs at Brown and Lifespan affiliates Rhode Island Hospital, Hasbro Children's Hospital and The Miriam Hospital.

Within the past two years, three new NIH COBRE grants have been funded within the Department of Medicine. These 5-year large collaborative grants receive several million dollars per year in funding from the National Institutes of Health. In 2017, Dr. Peter Quesenberry received a \$10 million COBRE grant for research in **Stem Cell Biology**. As of September 2018, Dr. Josiah Rich received a new \$11million COBRE grant to develop a **Center for Opioids and Overdose Research**. As of September 2018, Dr Elefterios Mylonakis received a new \$9.4 million COBRE grant to establish the **Center for Antimicrobial Resistance and Therapeutic Discovery (CARTD)**.

In 2016, Brown University and the affiliated hospitals were awarded a multi-million-dollar NIH CTR grant which will provide significant resources to strengthening the clinical research enterprises at all institutions through core resources and support. Phase II funding (2021-2026) was recently awarded. The CTR along with the Department support IRB navigators and biostatistical support personnel for physicians and trainees (resident physicians, medical students and fellows) in the Department. An annual research symposium features keynote speakers (2021: Dr. Harvey Alter, 2020 recipient of Nobel Prize in Medicine or Physiology) and abstract presentations by resident physicians.

Recent research activity has focused on COVID-19. Multiple clinical trials have been launched by Drs. **Karen Tashima, Timothy Flanigan and Ralph Rogers** and over 300 individuals have been en-

rolled in studies involving the antiviral drug remdesivir and convalescent plasma. Trials involving monoclonal antibodies, vaccines and immune modulators are underway. The Department of Medicine and the Lifespan Clinical Research Center have created a COVID-19 Biobank with clinical samples isolated from individual presenting with COVID-19. Over 200 individuals have been enrolled and 20 research teams are using the samples to forward their research on COVID-19 diagnostics, vaccinology and immunology.

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## Cardiology

### Basic Cardiovascular Research

**Bum-Rak Choi, Ph.D.** His research is aimed at elucidating cardiac arrhythmia mechanisms with the long-term goal of identifying potential new therapeutic targets and strategies to suppress malignant arrhythmias. His lab currently investigates the roles of APD dispersion in initiating arrhythmias in long QT syndrome using multi-disciplinary approach including fluorescence mapping of action potential propagation and Ca<sup>2+</sup> handling from intact heart, cell voltage clamp and confocal imaging, and computer modeling. Dr. Choi's lab also investigates potential roles of myocyte-fibroblast coupling in cardiac arrhythmias including myocardial infarction and atrial fibrillation. In addition, his lab aims at developing highly predictive preclinical models of human drug-induced proarrhythmic risk using hiPSC-derived cardiac engineered microtissue system in collaboration with Dr. Coulomb's laboratory at Biomedical Engineering department of Brown University.

**Gaurav Choudhary, M.D.**'s focus of research is to evaluate the mechanisms underlying vascular, cardiac, and skeletal muscle dysfunction seen in pulmonary vascular diseases. His laboratory uses a variety of in vitro, ex vivo and in vivo approaches utilizing the preclinical models of pulmonary hypertension and emphysema. In clinical research, his team is attempting to characterize the role and impact of cardiac dysfunction in settings of lung diseases and study the epidemiology of pulmonary hypertension.

**Anatoli Kabakov, Ph.D.** explores molecular and biophysical mechanisms of membrane transport in

## Cardiology (cont.)

cardiac myocytes and coronary arteries endothelial cells in normal and pathological conditions. He is interested in the effects of widespread mutations on functions of cardiac ion channels and subsequent effects on overall cellular ionic homeostasis and heart function. His recent studies include investigation of 1) regulation of hERG potassium channel trafficking by ubiquitin ligase rififylin (RFFL); 2) Regulation of cardiac L-type calcium channels trafficking by LITAF and NEDD4-1 ubiquitin ligase; 3) Function of small-conductance calcium-activated potassium channel in mice and patients with diabetes; 4) Effect of late sodium current blocker GS967 on polymorphic ventricular tachycardia in LQT2 rabbit model; 5) Regulation of cardiac Nav1.5 channel by LITAF via NEDD4-2 ubiquitin ligase. His current studies include investigation of 6) Electrical remodeling of rabbit cardiac myocytes during culturing. 7) Role of late sodium current in aged rabbits' cardiac arrhythmia.

**Gideon Koren, M.D.** He is interested in understanding the pathogenesis of cardiac arrhythmias through four main lines of investigation: 1) Mechanisms that underlie the increased prevalence of sudden cardiac death (SCD) in aged humans. The laboratory studies cardiomyofibroblasts senescence after myocardial infarction in aged rabbits. These studies may lead to the discovery of novel therapies for SCD; 2) Investigation of the transcription, trafficking, localization and degradation of voltage-gated ion channels in the cardiomyocytes and the effect of sex hormones on these processes. Specifically, the laboratory is studying the roles of three ubiquitine ligases (RNF207, LITAF and RFFL) in ion channels trafficking and degradation; and 3) Creation and characterization of genetically modified large animal models for studying sudden cardiac death. The laboratory is characterizing the arrhythmogenic phenotype of novel transgenic rabbit models of long QT syndrome (LQT) including LQT type 1, type 2 and type 5. The laboratory is now involved in developing gene therapy to treat long QT syndrome. 4) Finally, the laboratory is investigating the role of atrial cell senescence in atrial fibrillation in the aged rabbit and aged human hearts.

**Alan R. Morrison, M.D., Ph.D.**, leads an independent basic and translational research program focused on immune-mediated vascular remodeling, involving atherosclerosis and angiogenesis. He is PI on three ongoing studies: Development of Rac-Targeted Therapeutic Strategy for Treatment of Calcific Atherosclerosis (R01 HL139795); Reprogramming Macrophages to Improve Wound Healing in Diabetes (VA Merit I01CX002231); The Impact of Macrophage IL-1beta on

SARS-CoV-2 Virulence in the Setting of Experimental CAD (Harold S Geneen Charitable Trust Award); Identifying inflammatory markers of regression for coronary artery calcification (Lifespan CVI Pilot). He is completing studies as Project Investigator on the CPVB COBRE (P20GM103652, Directors Rounds and Harrington): IL-18 Signaling Promotes Atherosclerotic Calcification and Cardiovascular Risk. In addition to a robust basic sciences portfolio, Dr. Morrison's laboratory also provides a database, of over 1800 patients with lung cancer CT scans and 5 years of follow-up, that medical students, medicine residents, and cardiology fellows have taken advantage of for carrying out epidemiology studies assessing vascular calcification and outcomes.

**Glenn Radice, Ph.D.** His lab is interested in identifying novel genetic modifiers of heart disease. Using CRISPR/Cas9-mediated genome editing, mice were created that carry the identical mutations found in patients suffering from heart disease. The resident will assist with the histological, molecular, and functional characterization of the mutant mouse hearts.

**Karim Roder, Ph.D.** His research focuses on the role of (de)ubiquitination in cardiac excitation and disease. He is interested in delineating the molecular mechanisms of novel ubiquitin ligases, adapter molecules, or deubiquitinases affecting membrane proteins that underlie action potential duration and conduction velocity. He also shows interest in gene-specific therapy for congenital long QT syndrome using a rabbit model of long QT syndrome type 2 (LQT2).

### Clinical and Translational Research

#### Electrophysiology

**Michael Wu, M.D.** His research interests include artificial intelligence in treating persistent atrial fibrillation, physiologic pacing, and big data research.

**Cao Tach Tran, M.D., Ph.D.** His clinical and research interests include sudden cardiac death, potassium dynamics, and mechanisms of arrhythmias with special focus on modulators of cardiac repolarization.

#### Interventional Cardiology

**J. Dawn Abbott, M.D.,** Her research interests include percutaneous coronary intervention (PCI) and peripheral arterial disease. She is the site P.I. on the Myocardial Ischemia and Transfusion (MINT) trial evaluating a liberal versus restrictive transfusion strategy in patients with acute MI and ane-

mia; OASIS 9 trial of Colchicine and spironolactone in patients with ST elevation myocardial infarction; and AGENT IDE examining drug coated balloon for in-stent restenosis. She also has an interest in observational data and assessing the landscape of current interventional practice using dataset such as the NCDR Cath PCI Registry.

**Herbert D. Aronow, M.D., M.P.H.**, Research interests include the safety and effectiveness of percutaneous vascular intervention (PVI), percutaneous coronary intervention (PCI), and structural heart intervention and more recently on the intersection between COVID-19 and cardiovascular outcomes. He is involved in multiple registry-based research initiatives in these areas using resources such as NCDR Cath-PCI, PVI and TVT, SVS VQI, HCUP NIS, HCUP NRD, Vizient CDB and our LifeChart EHR. Dr Aronow also serves as site Principal Investigator for a number of ongoing studies, including SPYRAL HTN ON MED, a randomized, sham-controlled, multicenter study evaluating the effectiveness of renal denervation in patients with hypertension who are on medical therapy; CREST-2, a randomized trial comparing carotid revascularization (stenting or endarterectomy) with medical therapy for asymptomatic carotid stenosis; ECLIPSE, a randomized trial comparing orbital atherectomy with conventional angioplasty before drug-eluting stenting in patients with calcified coronary arteries.

**Paul C. Gordon, M.D.**'s research interests include evaluating therapies and novel devices for coronary and structural heart disease. His current research focuses on transcatheter aortic valves with projects such as Transcatheter Aortic Valve Replacement to UNload the Left Ventricle in Patients With ADvanced Heart Failure (TAVR UNLOAD) and the management of stable angina and CAD post tavr with either pci or medical therapy( TAVR Connect) Also beginning participation with a novel device to treat systolic heart failure patients: Clinical Evaluation of the AccuCinch® Ventricular Restoration System in Patients Who Present With Symptomatic Heart Failure With Reduced Ejection Fraction (HFrEF): The CORCINCH-HF Study.

**Peter A. Soukas, M.D.**, clinical research focus is on carotid stenting, endovascular treatment of PAD and venous disease. He is the global PI for the RELINE MAX trial of stent grafts for the treatment of bare metal restenosis. He is the site PI for the DISRUPT PAD III randomized trial of intravascular lithotripsy and drug coated balloon vs. angioplasty/drug coated balloon angioplasty, the CAD III coronary trial of in-

travascular lithotripsy, the DISRUPT PAD lithotripsy registry, the DISRUPT BTK below the knee study of intravascular lithotripsy for below the knee vessels, the VIVID study evaluating the use of the Vesper Medical venous stent, the RESTOR-1 study investigating the safety and effectiveness of the AngioSafe peripheral CTO device, the TOBA II BTK trial of Tack stents for below the knee vessels, the Detour II PQ Bypass for the use covered stents to perform percutaneous bypass, the Transcend randomized paclitaxel drug coated balloon trial, the STAND clinical trial of self-expanding stents for below the knee disease, the PERFORMANCE II and C-Guard carotid stent trials, The PQ Bypass TORUS-2 trial of covered stents for native SFA denovo and restenotic lesions, and the Elegance registry on the real world use of Ranger drug coated balloon and Eluvia drug eluting stents. Dr. Soukas is the Director of Brown Vascular & Endovascular Medicine Fellowship Program and has been named the co-Director for the 2021 Society of Cardiovascular Angiography and Interventions (SCAI). He has been a site PI on over 90 clinical trials.

### Non-invasive Cardiology & Imaging

**Brian G. Abbott, M.D.**, His clinical and research interests are cardiovascular imaging in the area of nuclear cardiology.

**Karen Aspry, M.D., M.S.**, has clinical and research interests in preventive cardiology, and population management of CHD and the treatment of lipoprotein (cholesterol) disorders. She conducts industry-sponsored lipid trials, and clinical research projects in the areas of familial hypercholesterolemia, and diet interventions to reduce ASCVD risk.

**Michael Atalay, M.D., Ph.D.** has clinical and research interests in cardiac amyloid, atrial septal defects, pulmonary embolism, acute aortic syndromes, and the modalities of MRI and CT. Specific active research projects include: (1) Evaluating the potential utility of non-ECG gated contrast CT for detecting cardiac amyloidosis and other non-ischemic cardiomyopathies, (2) Correlating imaging biometrics with outcomes in patients with type A aortic dissection, (3) Correlation of anatomic metrics with ASD shunt severity, and (4) Using vessel density values on CTPA to estimate cardiac output.

**Sebhat Erqou, M.D. Ph.D.** clinical interests include cardiovascular (CV) imaging and prevention. His research focus includes studying CV risk factors, differences in CV outcomes, and preventing CV disease in people with human immunodeficiency virus (HIV).

## Cardiology (cont.)

**Katharine French M.D., M.P.H.**, has expertise in women's cardiac health with a clinical and research interest in cardio-obstetrics. She has been active in research on peripartum cardiomyopathy and is currently the Lifespan site PI for the multicenter PROW-GAD registry focused on pregnancy in women with genetic predispositions to aortic dissection.

**Philip G. Haines, M.D., M.P.H., M.S.**, research interests include myocardial mechanics, left ventricular, right ventricular, and left atrial systolic strain, and advanced echocardiography. He has an LCVI Faculty Pilot Research Grant: Association of Left Atrial Strain with Embolic Stroke Subtype and Detection of Atrial Fibrillation in Patients with Embolic Stroke of Undetermined Source (ESUS). This is a collaborative project with the Brown Division of Neurology and involves deep phenotyping of clinical echocardiograms on stroke patients using an advanced TomTec research workstation with a focus on myocardial systolic strain evaluation. He is also involved in collaborative clinical research projects with the Brown Division of Pulmonary and Critical Care Medicine focusing on the evaluation of right ventricular strain in patients in the medical intensive care unit. He also collaborates with the UMass Division of Cardiology on the assessment of diastolic function in patients with atrial fibrillation. Finally, he was Co-PI on an Advance-Clinical Translational Research Pilot Project Program Grant with a focus on post hospitalization community pharmacy medication therapy management for heart failure. This is a multi-site collaboration between URI, Providence VA Medical Center, Brown, and Lifespan. Dr Haines also directs the advanced echo clinical research program and fellowship at the Rhode Island Hospital Echo Lab, co-directs the Brown-Lifespan-Wuhan, China-HUST academic research collaboration, and is Associate Director of the Rhode Island Echo Lab, and Director of Structural and interventional Echocardiography at Brown and runs and directs local, regional, national, and international workshops and lectures in structural and interventional echocardiography.

**Tasnim F. Imran, MD.** Her research interests include cardiovascular disease prevention (with a focus on lipids and cardiac rehabilitation) and women's cardiovascular health.

**Yash Patel, MD, MPH.** His research interests include the role of cardiac imaging in valvular heart disease, infiltrative cardiomyopathies, and prevention of cardiovascular disease. Dr. Patel's research projects include the following: Follow up of Cardiac MRI study

in patients with COVID-19 vaccination associated acute myocarditis; Compare phenotypic Cardiac MRI features of acute myocarditis associated with COVID-19 vaccination to acute myocarditis patients in the absence of COVID-19 infection or vaccination; Prognostic role of cardiac CT findings to in hospital outcomes in patients admitted with COVID-19 infections; Prognostic role of phenotypic cardiac MRI markers in patients with severe aortic regurgitation, including strain imaging and T1 mapping.

**Athena Poppas, M.D.** is conducting studies focused on echocardiographic evaluation of valvular heart disease and heart disease in women. She is a site Principle Investigator on NHLBI study in peripartum cardiomyopathy and Co-Investigator for cardiac analysis for NHLBI Pregnancy and Post-Acute Sequelae of SARS-CoV-2 (PASC). She participates in a number of investigator-initiated projects in conjunction with the cardiac surgery, anesthesia, maternal fetal medicine and heart failure group. The echocardiography database is a resource for pilot projects for numerous residents and fellows.

**Raymond Russell, M.D., Ph.D.**, clinical expertise is in noninvasive cardiology (nuclear cardiology) and cardio-oncology (cardiovascular complications of cancer and cancer therapy). His research interests are derived from his area of clinical focus. Specifically, he is interested in the application of noninvasive imaging to the detection of chemotherapy-associated cardiotoxicity and the identification of novel technologies that can identify cardiotoxicity prior to a decrease in left ventricular ejection fraction. These technologies include measurement of global longitudinal strain by echocardiography and phase analysis of gated blood pool images. In addition, he is interested in the utilization of nuclear cardiac imaging to diagnose cardiac amyloidosis.

**Elena Salmoirago-Blotcher M.D., Ph.D.**, is interested in the study of behavioral strategies for the promotion of cardiovascular health (physical activity, medication adherence) in patients with, or at risk for, cardiovascular disease. She also conducts research on stress (takotsubo) cardiomyopathy as a model for the study of the complex interactions between psychological factors, reproductive factors and acute CV conditions in women. She collaborates with the Women's Health Initiative (WHI) study and can assist residents interested in exploring research questions related to psychosocial factors and CV disease using the WHI AND OTHER datasetS.

## Cardiology (cont.)

**Nishant R. Shah, M.D., M.P.H.** has clinical and research expertise in cardiovascular imaging. His research focuses on improving the appropriateness, timeliness, safety and effectiveness of cardiac testing for patients with known or suspected heart disease.

**Christopher Song, M.D.** clinical and research interests include echocardiography, atrial cardiopathy, stroke, and quality improvement. He is the site PI for the ARTESiA trial (Apixaban for the Reduction of Thrombo-Embolism in Patients with Device-Detected Sub-Clinical Atrial Fibrillation) and a site co-investigator for the ARCADIA trial (AtRial Cardiopathy and Antithrombotic Drugs in Prevention After cryptogenic stroke).

**Wen-Chih Hank Wu, M.D., M.P.H.** has conducted research work in the areas of cardiovascular and diabetes epidemiology and outcomes with focus on system redesign to prevent adverse cardiovascular outcomes. He receives research grant funding from the VA Merit Review, NIH and non-profit organizations.

### Heart Failure and Transplantation

**Daniel J. Levine, M.D.** is interested in heart failure and transplantation. He is the site P.I. on several ongoing clinical research studies including: PARAGLIDE Trial, a multicenter, randomized, double-blind, double-dummy, parallel group, active controlled 8-week study to evaluate the effect of sacubitril/valsartan (LCZ696) versus valsartan on changes in NT-proBNP and safety and tolerability of inhospital initiation of LCZ696 compared to valsartan in HFpEF patients with acute decompensated heart failure (ADHF) who have been stabilized during hospitalization; GUIDE-HF IDE, trial of Hemodynamic-GUIDEd Management of Heart Failure.

## Endocrinology

**Geetha Gopalakrishnan, MD - Coordinates** clinical investigations related to adult endocrine diseases. Studied the effect of new pharmacological agents in the management of bone loss related to postmenopausal osteoporosis, hyperparathyroidism, and cancer. Collaborated with other investigators to determine the bone and body composition of certain disease states like HIV infection, breast cancer and anorexia. More recently, research interests have broadened to include new treatments for diabetes and obesity.

## Endocrinology (cont.)

**Vicky Cheng, MD** - Interest in general endocrinology including Diabetes, Pituitary, Adrenal and Thyroid disease. Current projects focus on evaluating outcomes related to diabetes and renal disease in patients hospitalized with COVID-19 infection.

**Jasmin Lebastchi, MD** - Research focuses on insulin resistance, diabetes, and obesity. Currently investigating the outcome of diabetic and/or obesity patients admitted with Covid 19 and participating in investigational drug trials for patients with obesity.

**Amanda Fernandes, MD** – Leads the quality improvement efforts for the Division. Projects related to transition of care and reducing rate of hyperglycemia and hypoglycemia in the inpatient setting are under investigation. Other areas of interest include investigational drug trials related to both common and rare endocrine disorders such as diabetes and congenital adrenal hyperplasia.

**Tonslyn Toure, MD** – Interest in developing scholarship related to medical education with focus on diversity, equity, inclusion, and wellness. Projects evaluating recruitment and curriculum related to endocrine fellowship training are in progress.

## Gastroenterology

### Liver Research Center

**Jack R. Wands, MD** - My research efforts involve the role of signal transduction cascades in the pathogenesis of hepatocellular carcinoma (HCC) at the molecular level. I am also interested in immunotherapy of HCC.

**Suzanne de la Monte, MD, MPH** is interested in the molecular mechanisms of programmed cell death as well as the role of aspartyl (asparaginy)-beta-hydroxylase (ASPH) in cell motility and invasiveness of tumor cells as well as neuronal cells.

**Xiaoqun Dong, MD, PhD** – My research interest is based on the observation that embryonic development and differentiation share common signaling pathways with malignant transformation of the adult tissues, therefore, targeting those pathways may exert inhibitory effects on cancer initiation and progression. We apply 3D culture, organoids, orthotopic, lung and liver metastatic, patient-derived xenograft (PDX) and genetically engineered mouse models (targeted knock-in, conditional knock-out and randomly transgenic) to

## Gastroenterology (cont.)

investigate the molecular mechanisms underlying tumorigenesis as well as to identify novel targeted therapy for multiple cancers.

**Jisu Li, MD, PhD** – Hepatitis B and C viruses are major causes of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma. Our laboratory is interested in identifying hepatitis B virus receptors and co-factors responsible for the pathogenesis of these diseases.

**Steven Moss, MD** - Research interests are in the pathogenesis of gastrointestinal cancers in general and gastric cancer in particular. Since gastric cancer is the first malignancy related to a chronic bacterial infection, my laboratory examines the carcinogenic effects of *Helicobacter pylori* on gastric epithelial cells at cellular and molecular levels.

**Shuping Tong, MD, PhD** - Research interests involve investigations of hepadnaviral receptor proteins on hepatocytes. Using related duck hepatitis B virus (DHBV) as a model, we have identified p170, or duck carboxypeptidase D (DCPD), as a binding partner for viral pre-S envelope protein. Studies are in progress to define the contact site on the p170 for the pre-S1 region of DHBV. Similar investigations are being performed with hepatitis B virus (HBV).

### Clinical Research

**Fadlo Habr, MD** – My translational research interests involve interventional Gastroenterology, mainly pancreatic-biliary endoscopy and photodynamic therapy of esophageal cancer and cholangiocarcinoma. We'll be looking at the effects of PDT on end-stage cholangiocarcinoma. The Division of Gastroenterology at Brown Medical School is part of a multicenter national prospective study looking at the role of EUS in the evaluation of cystic lesions of the pancreas. Fluid from the pancreatic cyst will be aspirated under EUS-guidance and tested for specific genetic markers as well as for monoclonal antibodies.

**Sarah Hyder, MD** – My clinical research interests are in pancreaticobiliary disorders and advanced therapeutic endoscopy including endoscopic ultrasound and endoscopic retrograde cholangio-pancreatography (ERCP). My areas of expertise include biliary disorders, pancreas disorders and therapeutic endoscopy including ERCP and EUS (endoscopic ultrasound).

**Amanda Pressman, M.D.** – My research and clinical interests are focused on Hepatitis B in pregnancy, HCC surveillance in post-partum patients with Hepatitis B. They also include the development of curricula

for standardization and teaching of functional GI disorders, including Fecal Incontinence/ Dyssynergic Defecation. There is research in this Program for Pelvic Floor Disorders, as well.

**Kittichai Promrat, MD** – Interests are in the natural history and therapy of chronic liver diseases, in particular hepatitis B, C and nonalcoholic steatohepatitis (NASH). Research efforts involve the roles of insulin resistance and obesity in the pathogenesis of NASH. Another area of research interest is in identification of host immunogenetic factors that involve in clinical outcomes and treatment responses of viral hepatitis.

**Harlan Rich, MD** – Interests are in clinical Esophagology with an emphasis on gastroesophageal reflux disease and Barrett's esophagus, as well as general gastroenterology (including colorectal cancer screening, peptic ulcer disease, and irritable bowel syndrome). We are currently expanding the role of technology in clinical gastroenterology via the use of ambulatory telemetric pH and capsule endoscopy devices. Research includes creating a database on a large Barrett's surveillance population, studying the acute effect of esophageal acid perfusion on esophageal motility and LES function in humans, and studying genomic alterations in Barrett's epithelium.

**Colleen Kelly, M.D.** – My clinical translational research is focused on chronic *C. difficile* infection. I have developed a program of fecal transplantation wherein microbiota of the gut is analyzed before and after transplant; to date, results show that 95% of individuals undergoing this experimental procedure have total eradication of the infection.

**Sean Fine, M.D., M.S.** – I have an interest is in inflammatory bowel disease and new biologic therapy for this disease. My major interest is in translational research and is engaged in several approaches to modify the disease progression and induce long term remission.

**Abbas Rupawala, M.D.** – My interest is in developing new approaches for predicting disease flairs in inflammatory bowel disease. I am involved in the construction and implementation of apps that could be used on a smartphone to identify early disease recurrence during therapy in collaboration with biotechnology engineers.

**Zilla Hussain, MD** - My clinical and research interests include gastrointestinal reflux disease, esophageal motility disorders, Barrett's esophagus, Eosinophilic Esophagitis, and achalasia.

## General Internal Medicine

**Christine Duffy MD MPH** is interested in cancer survivorship including models of care, survivorship curriculum development for residents and faculty, and the impact of lifestyle changes in cancer survivors.

She is also interested in quality improvement projects at the Fain Primary Care clinic having worked on QI projects including improving advance care documentation, diabetes management and heart failure management with residents.

**Rebekah Gardner, MD** is interested in medical education, reducing bias in written assessments, and peer mentoring in academic medicine. She also collaborates on statewide public reporting of physician use of health information technology and the impact of technology on workflow and stress.

**Meghan Geary, MD** is interested in women's health and addiction. Her primary care practice includes refugee patients and women who are in a residential treatment for substance use disorder.

**Vidya Gopinath, MD** is interested in women's health and medical education research around women's health teaching in internal medicine residencies. She also is interested in outpatient procedures and resident training to increase comfort with musculoskeletal and gynecologic outpatient procedures.

**Ross Hilliard, MD** has interests focused on the Electronic Health Record and in patient entered data and the interplay with the EHR. Current grant funding supports a pilot study using an app where patients enter symptoms to form a differential diagnosis and triage decision, compared to actual primary care visit diagnoses and outcomes. He is also interested in the ways in which the EHR can help drive clinical quality improvement, including opportunities for improving routine screenings such as for colon cancer as well as adherence to best practices and clinical guidelines in diagnostic testing.

**Jennifer Jeremiah, MD** is interested in medical education, specifically in the areas of remediation, promotion of learner success and faculty development to improve evaluation of and feedback to learners. She has presented on these topics at AAIM/APDIM (Alliance for Academic Internal Medicine/Association of Program Directors in Internal Medicine). She chairs the Department of Medicine Residency Clinical Competency Committee and is the Director of Faculty Development in Clinical Education. Dr. Jeremiah also is interested in promoting resident and practicing physician well-being and serves as the Wellness Champion for the State of Rhode Island ACP (America College of

Physicians) Chapter.

**Hussain Khawaja, MD** is interested in medical education with a focus on inpatient medical care, including quality improvement projects and curriculum development.

**Suzanne McLaughlin, MD MSc** is interested in patient-centered medical home activities and resident learning in the continuity clinic environment.

Her medicine-pediatrics colleagues and she have active research/QI projects in: SBIRT (Screening, Brief Intervention and Treatment) for adolescent substance use in primary care, Integrated Behavioral Health (use of mental health screening tools and access to behavioral health services), and are part of a national collaborative of MedPeds residency programs to develop curriculum and evaluation tools for training residents in health care transition.

**Kelly McGarry, MD, FACP** has research interests in women's health, LGBT health and medical education. She also writes review articles on women's health topics including the prevention and treatment of osteoporosis and treatment of postmenopausal symptoms. She is a co-editor of the women's health textbook, *The 5-Minute Consult Clinical Companion to Women's Health*, by Lippincott Williams & Wilkins. She co-wrote "Women's Health Topics" in *Cecil's Essentials of Medicine*, 9th Edition. She is currently working on a project related to home visits and transitions of care and another project on faculty development.

**Susan Ramsey, PhD** conducts research aimed at developing and testing behavioral interventions to improve health. She currently serves as principal investigator on an ongoing NIH-funded study that aims to develop and test an intervention to promote use of HIV pre-exposure prophylaxis (PrEP) among at-risk women who are incarcerated and to link them to community-based PrEP care upon release from incarceration. She also serves as principal investigator on an NIH-funded, multi-site study that examines the impact of a smartphone-facilitated health coaching intervention to improve HIV medication adherence and is in the process of conducting an internally funded study to examine the impact of this intervention on PrEP adherence. In addition, she serves as a co-investigator or mentor on multiple NIH-funded studies focused on opioid use disorder and overdose risk reduction.

**Mindy Sobota, MD MS** completed a General Medicine Fellowship at Montefiore and received a Mas-

## General Internal Medicine (cont)

ter's in Research. She speaks Spanish fluently and predominantly cares for Latinx patients. Her areas of interest include training general internists to provide comprehensive primary care, including outpatient orthopedic procedures and comprehensive family planning, including IUDs, implants, and medication abortion

**Rahul Vanjani, MD** areas of interest focus on the impact of correctional control (incarceration, probation, parole) on health, the evaluation of multidisciplinary programs that center the role of the community health worker and provide wraparound services to patients, and the education of students, residents and faculty around the neurobiological and psychosocial determinants of addiction

**Sarita Warriar, MD** has an interest in medical education research, currently participating in two federally funded grants focused on social determinants of health education and weight management counseling skills for medical students. She is one of the co-directors of the Clinician Educator Track for internal medicine residents and is the director of the medical education elective month, which helps residents implement educational innovations and improve teaching skills.

## Geriatrics and Palliative Medicine

**Stefan Gravenstein, MD, MPH**, is the David S. Greer Professor of Geriatrics and Director of the Division of Geriatrics and Palliative Medicine at the Alpert School of Medicine of Brown University. Research foci include immunity, inflammation, vaccine response, and improving care transitions. Current projects are centrally focused on the influence and effects of COVID-19, influenza and RSV within long-term care facilities. He works in collaboration with many faculties here and at other Universities. Dr. Gravenstein is well funded, providing ample research opportunities. The most recent funding is with the Centers for Disease Control, Atlanta, on duration of post-vaccination immunity and will likely be expanded to include clinical correlates

**Tom Bayer MD** completed the Brown Geriatrics fellowship in 2021, is currently a fellow in advanced health services research at the Providence VA and is a master's degree student in the Brown School of Public health. His interests include dementia care quality, clinical program development and evaluation, and the impact of dementia care on the re-

## Geriatrics and Palliative Medicine (cont)

sponse to COVID-19 in VA Community Living Centers.

**Richard W. Besdine, MD**, former Division Director and former Director of the Center for Gerontology and Health Care Research, stepped down from leadership last year. He currently teaches extensively, mentors residents and fellows, and participates in several of Dr. Gravenstein's research projects, mostly related to Covid-19.

**Julio Defillo-Draiby, MD**, is the Director of Geriatric Education and Clinical Programs for the Department of Geriatrics & Palliative Care at Care New England. He is the lead geriatrician for the Acute Care for Elders unit at Kent Hospital and Assistant Professor of Medicine at the Warren Alpert Medical School of Brown University. His research foci include the prevention of geriatric syndromes in hospital settings and the reduction of post-operative complications in high-risk older adults. He is passionate about teamwork and value-based care interventions. His recent publications and current research work examine the impact of geriatric co-management as a way to optimize care for older adults while decreasing overall costs.

**David M. Dosa, MD, MPH**, jointly conducts research through Brown University's Center for Gerontology and the VA. His research foci are nursing home and assisted living quality, community programs to serve frail elders, nursing home infections, and pharmacoepidemiology in the elderly. Dr. Dosa has two current grants that are in progress. The first is focused on improving antimicrobial stewardship in veteran affairs community living centers sponsored by the VA HSR&D for ~\$1.1M over a course of four years from December 2016 – November 2020. The second is also funded by the HSR&D for COIN (Center for Innovation) which supports partnered and cross-medical center research and serves as a resource for the co-education of research fellows and junior faculty. It is funded for \$600,000 annually and was extended in 2016 until 2021

**Lynn McNicoll, MD**, is the Director of Education for the Division and Director for Quality Outcomes for the Department of Medicine. She oversees many junior faculty and research projects focused on quality improvement. Her research foci include delirium, quality improvement within hospitalized older adults, and geriatric-surgical co-management. She is actively involved in the Hartford Foundation AGS CoCare: Ortho Dissemination project which

## Geriatrics and Palliative Medicine (cont)

aims at assisting institutions in implementing Fragility Fracture co-management programs. Additionally, Dr. McNicoll's most recent publishing's speak on the topic of implementing the geriatric-orthopedic co-management program in the US and internationally.

**Nadia Mujahid, MD**, the Director of the mandatory Geriatric Medicine rotation for Internal Medicine residents and is the Course Director for the Geriatrics Orthopedic rotation for the Geriatric Medicine fellows at Brown. Dr. Mujahid began the first co-management program between the Division of Geriatrics at Brown University and Orthopedic Surgery. As Co-Director of the Geriatric Fracture Program, she has focused her efforts on reducing the length of stay, inpatient mortality, and readmission rates for elder adults. She has been the presenter and moderator for many AGS Co-Care: Ortho events. Numerous project opportunities are available for residents. This is great of the mandatory Geriatric Medicine rotation for Internal Medicine residents and for Geriatric Medicine electives.

**Iva Neupane, MD**, leads the Geriatrics-Trauma Surgery Co-management program at RIH and is the Co[1] Director of the scholarly concentration in aging along with Dr. McNicoll. Her recent works focus on the statistically significant reduction of the mortality rates among trauma patients who are over the 80 years old with the implantation of the co-management program. Resident project opportunities are considerable.

**Sakeena Raza, MD**, provided co-management care to the postoperative patients on the Elective-Joint Orthopedic service at The Miriam Hospital till August -10-2021. Her research work includes an abstract on the impact of geriatric-urology co-management which she was involved in from 2016-2018. Her findings indicate a reduced length in hospital stays among older patients who had post-operative geriatrics co-management. She is currently completing the manuscript for this.

With increasing interest in long-term care, she left the elective joint orthopedic service at the Miriam hospital in August 2021. She has increased her clinical time at Saint Elizabeth's nursing home with the aim of increasing her experience in managing long-term care patients and exploring research opportunities in the long-term care setting.

**Mriganka Singh, MD**, has interest and extensive experience in the inpatient Geriatrics Co-management model of care. She has launched and developed co-management programs in Trauma, Orthopedics and Heart failure. She currently leads the Elective Joints Geriatrics Co-management program at Lifespan's Mir-

iam hospital and is working on launching Lifespan's first Geriatrics Heart Failure Program. She also has interest and experience in Quality and Systems improvement and is the Physician lead for Lifespan's Age Friendly Health System Initiative at the Miriam Hospital. She also serves as the course director for Quality improvement at the Brown School of Public Health.

**Mitchell Wice, MD** is the director of the surgical oncology co-management service at Rhode Island Hospital. His interest and research are in how to deliver optimal care to multimorbid complex patients in varying healthcare settings with respect to reducing healthcare cost. In addition, he has a focus on medical education with respect to teaching

multimorbidity along with how best to mentor trainees and integrate the fields of geriatrics and palliative and hospice medicine.

## Hematology & Oncology

The division of hematology/oncology is involved in clinical research, populations based research and basic laboratory research in cancer biology. We currently have approximately 50 clinical research studies of new anticancer drugs including first-in-man studies, and phase I and II studies. Research opportunities are available in these three areas.

**Howard Safran, MD – Division Director:** Dr. Safran is involved in investigator initiated studies in esophageal cancer and glioblastoma. He also participates in biotech trials of immunotherapy and targeted therapies and has been the lead researcher in first-in-man trials. Dr. Safran is also involved in populations research assessing why RI has high rates of certain cancer.

**Benedito Carneiro, MD**, is the leader of clinical cancer research at the Lifespan Cancer Institute. He is involved in immunotherapy, antibody drug conjugates and signal transduction targeting. He is collaborating with basic scientists at Brown University on DNA repair to develop new combinations of agents such as combining a PARP inhibitor with a PI3 kinase inhibitor.

**Don Dizon, MD** is evaluating immunotherapy and PARP inhibitors in GYN cancers. Dr. Dizon is a world leader in researching on-line communication, digital health and patient reported health outcomes.

**Christopher Gerald Azzoli, MD**, is involved in

## Hematology & Oncology (cont)

clinical research in lung cancer. Dr. Azzoli will also be involved in strategies across the state to try to reduce the incidence of lung cancer. He is a leader in the American Society of Clinical Oncology establishing clinical care guidelines. He is also involved in developed new therapies for lung cancer.

**John Reagan, MD** has been investigating cellular immune therapy for refractory leukemia and lymphoma. He is studying whether host tolerance to cancer is reversed by stem cell rejection. He leads important clinical studies in cellular therapy.

**Adam Olszewski, MD** performs analysis of large databases and populations based research. He is principal investigator of multiple studies involving antibody drug conjugates for lymphoma. He is also leading our clinical research study of allogeneic CAR-T cells.

**Hina Khan, MD** is involved in lung cancer research that focus on immunotherapy. She is also involved in populations research in lung cancer etiology.

**Humera Khurshid, MD** has initiated a geriatric oncology program at RIH and TMH. This is a multidisciplinary program involving oncology, geriatrics, nutrition and pharmacology. This program evaluates whether early geriatric assessment can optimize the safe and effective administration of chemotherapy.

**Khaldoun Almhanna, MD**, will be developing novel investigator initiated studies in liver and esophageal cancer. He also studies immunotherapy for GI cancers

**Mary Anne Fenton, MD**, is involved in quality outcomes. Her assessments have been presented at major national meetings. She studies methods to increase the use of the American Society of Clinical Oncology Quality Improvements within practices.

**Rochelle Strenger, MD**, research focus is centered on treatment of adults with cancer with developmental disabilities such as autism. She studies strategies for care and team based approaches.

**Dr. Anthony Mega**, the head of the section of GU oncology. His research involved studying immunotherapy in GI cancer.

**Andre Desouza, MD** research concentrates on GU oncology and phase I studies. He is also interested in genomic alterations in GU cancer.

**Tom Ollila, MD** is involved in research in CNS lymphomas.

**Alex Raufi, MD** is involved in investigator initiated

research in gastric and esophageal cancer. He is involved in neoadjuvant treatment of these malignancies. He is also involved in laboratory correlative studies. He is a very active clinical and basic researcher with multiple new projects expected.

**Stephanie Graff, MD** is an expert in breast cancer clinical research and will lead our clinical research program in breast cancer. She is also an expert in community outreach and the use of social media.

**Eric Wong, MD** will join our faculty in October 2021. He will lead our research in brain tumors. He is an expert in drug therapy for glioblastomas and the use of tumor treating fields.

### BASIC RESEARCH

The Hematology/Oncology Division has a broad basic research portfolio.

**Dr. Wafik El Deiry, MD, PhD** is the head of cancer biology at Lifespan and Brown University. His laboratory is involved in multiple aspects of translational research including apoptosis, novel cancer targets, immunotherapy and organoids.

**Peter J. Quesenberry, MD** focuses on the role of microvesicles in cellular communication in human cancers. He is interested in reversal of the oncogenic phenotype by microvesicles. He is also interested in using microvesicles to reduce damage by radiation and to treat pulmonary hypertension.

**Patrycja Dubielecka-Szczerba, PhD**, is working on approaches to reverse resistance to tyrosine kinase inhibitors in chronic myelocytic leukemia and more recently on a unique model of murine myelofibrosis. This latter model is unique and opens unique potential for understanding myelofibrosis and developing new therapeutic strategies to treat this disease.

**Sicheng Wen, PhD** He is studying the capacity of mesenchymal stem cell derived vesicles to reverse radiation damage to marrow and to treat murine models of aplastic anemia.

**Dr Olin Liang** is studying the role of microenvironment in supporting normal and malignant hematopoiesis and the impact of aging on the marrow microenvironment.

**Paul Bertone, PhD**, is studying brain tumors by investigating glioma. He is an expert in single cell technologies. He also performs computational biology

## Immunology & Infectious Diseases

**Antimicrobial Drug Discovery** Groups in our Division are working to identify new classes of antimicrobials with antivirulence or immunomodulatory efficacy and evaluate toxicity/efficacy.

**Global Health** The Global Health Initiative (<http://brown.edu/initiatives/global-health>) is a multidisciplinary university-wide effort to reduce health inequalities among underserved populations locally and worldwide through education, research, service and development of partnerships with communities and institutions in Africa, India, Southeast Asia, the Caribbean, and the Pacific.

**HIV/AIDS** The Division has an in-depth focus in the area of HIV/AIDS. The NIH funded Providence/Boston Center for AIDS Research ([www.provboscfar.org](http://www.provboscfar.org)), based at The Miriam Hospital supports laboratory and clinical HIV prevention and treatment research.

The AIDS Clinical Trials Unit (ACTU) at The Miriam Hospital/Brown conducts clinical trials in HIV-infected adults to test novel therapeutic interventions focused on HIV-associated inflammation and resulting end-organ disease, tuberculosis, viral hepatitis and HIV cure.

**Health Disparities, Advocacy and Policy** The Center identifies, initiates, and supports projects that respond to the epidemic of incarceration and recidivism in the criminal justice system and the associated complex public health crisis.

**Additional opportunities are available in the following areas:**

**Infection Prevention and Control, Mycology, Sepsis Research , Sexually Transmitted Diseases, Travel Clinic, Transplant and Oncology (“Immunocompromised Host”) Infectious Diseases, and COVID-19**

**Curt G. Beckwith, MD** conducts NIH-funded research related to HIV and viral hepatitis among at-risk populations, including persons involved with the criminal justice system and substance users. Research interests include novel testing approaches for HIV and viral hepatitis and development and implementation of interventions to improve adherence to HIV treatment and care.

**Angela M. Caliendo, MD, PhD:** Dr. Caliendo’s research has focused on the development of molecular diagnostic tests for the detection and quantification of infectious diseases and assessment of their clinical utility; molecular testing in transplantation; standard-

ization of viral load testing; and evaluation of HIV-1 RNA burden and the development of antiretroviral resistance in HIV-1 seropositive women.

**Philip A. Chan, MD, MS** performs research in several areas including HIV and STD prevention, LGBTQ health, health disparities, and public health. Dr. Chan has specific expertise in HIV/STD prevention including diagnosis and testing, as well as pre- and post-exposure prophylaxis (PrEP and PEP, respectively). He is PI of seven NIH grants related to these topics.

**Cheston B. Cunha, MD,** Research interests include general infectious diseases, antimicrobial therapy, and antimicrobial stewardship including impact of rapid diagnostics and oral antimicrobial therapy.

**Susan Cu-Uvin, MD:** Research Interest: My main field of research is HIV in women. This includes understanding HIV dynamics and reservoirs in the female genital tract, sexually transmitted diseases in particular and Human Papilloma Virus infection (HPV). We have funding to assess HPV infection in HIV infected women, including cervical neoplasia and cervical cancer, and response to treatment. My research also involves assessment of microbicides to prevent HIV transmission to women. As Director of the Providence/Boston Center for AIDS Research, I coordinate efforts to support multidisciplinary HIV research at Brown and Boston University and their affiliated hospitals.

**Current Research Studies:** Dr. Cu-Uvin’s research focuses on HIV in women, HIV/HPV and cervical pre-cancer and cancer (Kenya), cervical cancer screening in low income countries (Bangladesh) and HIV among MSM and LGBT populations (Philippines). As Director of the Providence/Boston Center for AIDS Research, the CFAR supports investigators involved in HIV related research through Core Services and Developmental Grant awards.

**Erika M. D’Agata, MD, MPH,** research focuses on the transmission dynamics of multidrug-resistant organisms in a variety of healthcare settings, including dialysis units and long-term care facilities. Her research focuses on characterizing and quantifying the most effective prevention strategies aimed at minimizing their spread, using both clinical epidemiological methods and mathematical modeling.

**Dimitrios Farmakiotis, MD,** is the Director of Transplant and Oncology ID (TOID). Our research interests focus on infections in non-HIV immunocompromised patients (solid organ transplant recipients

and patients with hematologic malignancies) and VAD recipients, specifically CMV, hepatitis-C and HIV in organ transplantation, invasive fungal infections, particularly mechanisms and clinical significance of resistance to antifungals in *Candida* species, and antifungal stewardship. Mentees have the opportunity to work with multi-institutional observational datasets on candidemia, invasive mold infections, CMV, COVID-19, as well as the Brown kidney transplant database, prospective clinical studies on antifungal agents and management of CMV, COVID-19 and interesting case studies. The TOID team has 2 dedicated research assistants (RAs), in addition to sharing research staff from the Lifespan Cancer and Transplant Institutes. Over the last 2 years, we have published >30 peer-reviewed manuscripts, including at least 6 in very high-impact journals with Impact Factor of >30. Our ID-oriented mentees have co-authored peer-reviewed articles and matched in competitive fellowship programs of their first choice, such as UPenn or Mass. General Hospital/Brigham & Women's Hospital.

**Timothy P. Flanigan, MD:** Research Interests: Major interests include HIV and other infectious diseases among marginalized communities. I participate in the Providence/ Boston Center for AIDS research and a T32 funded training program to prepare postdoctoral fellows (physicians and behavioral scientists) for research careers in the cross-disciplinary field of HIV and other infections associated with substance abuse. I have participated in HIV care within corrections and among substance users for over 25 years.

**Current Research Studies:** Involved in a recent COVID-19 study. He is PI of an Emerging ID Scholars at Brown University grant and part of a COBRE in Special Populations Core. His long term research has been HIV and other infectious consequences of substance abuse along with International research training.

**Beth Burgwyn Fuchs, PhD** focuses on discovery and development of new antimicrobial compounds that inhibit bacterial and fungal pathogens. Research in her lab leverages invertebrate infection models to aid in the discovery and development processes. Inhibitory agents are coupled to innovative delivery approaches.

**Sara Geffert, MD** research interests include evaluation of innovative rapid diagnostics and quality improvement with respect to current microbiological testing.

**Fizza S. Gillani, PhD,** research interest focusses on epidemiology of HIV/AIDS, TB, Hepatitis B/C in national as well as international settings. International involvement include work in Ghana, Ukraine, and Pakistan. Participates in the Providence-Boston center for AIDS research, Brown Center for Translational Research (CTR) and a few other NIH funded grants. She is also a part of local Ryan White HIV care program where her focus is on clinical quality improvement and performance measures. Her area of interest also includes healthcare informatics and data analytics.

**Erica J. Hardy, MD, MMSc.** Research interests include infectious disease in pregnancy and post-partum as well as sexually transmitted infections in women and the medical care of women after sexual assault as well as sexual assault prevention. Grant funding has included funding to explore genital immunology as it relates to sexual violence and current grant funding supports creating a novel online curriculum to teach trauma informed care of the sexual assault survivor.

**Joseph I. Harwell, MD** focuses his research on HIV and related complications in international settings. Through his work with the Clinton Health Access Initiative Dr. Harwell has helped to design an ANRS-funded study to explore the optimal approach to third line antiretroviral therapy in Cambodia. Dr. Harwell has designed operational research programs to describe the barriers and facilitators in LMIC to the nationwide adoption of dolutegravir as initial HIV therapy in adults and to examine delivery approaches to dolutegravir dispersible tablets in children.

**Rami Kantor, MD:** Research Interests: HIV research in local and global settings including transmitted and acquired antiretroviral drug resistance in diverse HIV variants, populations and settings; HIV transmission networks; treatment-failure monitoring; and laboratory infrastructure, involving clinical research, bioinformatics, molecular epidemiology and basic science.

**Current Research Studies:** Dr. Kantor's NIH-funded research focuses on HIV drug resistance in diverse populations, ages and settings; HIV transmission networks and their integration with public health; and treatment monitoring of people living with HIV. Some current projects address HIV drug resistance in Kenyan youth and in Indian adults, and integration of molecular epidemiology into public health activities in Rhode Island to prevent HIV transmission. He is currently also extending his lab's expertise to explore COVID-19 genomics and dynamics. He is committed to training and education, and

## Immunology & Infectious Diseases (*cont*)

also has a NIH grant dedicated to mentoring of physicians with research interests.

**Michelle A. Lally, MD, MSc**, Research interests include the integration of biomedical and behavioral interventions to prevent HIV, and quality improvement efforts that focus on disease prevention.

**Jerome M. Larkin, MD**, research interests include home-based intravenous antibiotic therapy, tick related infections and HIV infection in children and adults.

**John R. Lonks, MD**, research has explored the mechanism of pneumococcal resistance, particularly as it pertains to macrolide antibiotics. This program has characterized the clinical failure of therapy with macrolides among individuals with invasive pneumococcus treated with macrolide antibiotics.

**Leonard A. Mermel, DO, ScM**, is internationally recognized for his research focused on understanding the epidemiology, pathogenesis, and prevention of healthcare-associated infections. He is included in the 2018 & 2019 Highly Cited Researchers list by Web of Science & Clarivate Analytics.

**Maria D. Mileno, MD**, is interested in returned travelers with illness. She is currently involved in a project that may help screen travelers for TB by using their smart phones.

**Jennifer Adelson Mitty, MD, MPH**, Clinical and research interests include general infectious diseases, HIV treatment and prevention, and Lyme disease.

**Eleftherios Mylonakis, MD, PhD**, is internationally recognized for his research on the study of host and microbial factors of infection and the discovery of antimicrobial agents, or substances that kill or inhibit the growth of microorganisms such as bacteria or fungi.

**Gerard Nau, MD, PhD**, is a physician-scientist with interests in innate immunity and genetic predisposition to infections. His laboratory studies host-pathogen interactions and microbial pathogenesis, and is internationally known for its work on tularemia. Recent initiatives include the immunology and pathogenesis of SARS-CoV-2. The main objective is to translate information from pre-clinical studies into new diagnostics and therapies to treat infectious diseases.

**Steven M. Opal, MD**, Research interests are focused upon the immunopathogenesis of invasive bacterial and viral pathogens and septic shock research. He does primarily translational research from the basic cellular immunology and molecular pathogenesis of bacterial toxins and virulence factors, preclinical models of severe infection, up to late stage phase 2 and phase 3

clinical research investigations. He does research with biohazardous pathogens and their rapid molecular diagnosis and treatment. He also helps coordinate and direct international clinical trials in septic shock and severe infection.

**Bharat Ramratnam, MD**, currently has an NIH funded project which is focused on a better understanding the role of reproductive hormones on HIV-1 transmission (R01HD072693) and determining whether substance abuse alters a cell's capacity to support viral replication (P01AA019072). A separate interest is in better defining the cellular components of atypical responses to HIV such as those observed among individuals who become infected but are able to autonomously control viral replication.

**Donald P. Rice, Jr. MD**, focuses on research, treatment, and education at the intersection of addiction and infectious diseases including treatment and prevention of HCV, HIV, and bacterial infections as well as tick-borne diseases.

**Louis B. Rice, MD**, is an international authority on antimicrobial resistance in bacteria. His research interests include understanding the mechanisms of antibiotic resistance in bacteria; preventing hospital infections; and developing antibiotic usage strategies that will minimize the emergence and spread of antibiotic resistance.

**Josiah D. Rich, MD., MPH.**, research focus is on the overlap between infectious diseases and illicit substance use and disadvantaged populations, especially prisoners and others involved with the criminal justice system. He is also focused on addressing the Opioid overdose crisis. He is the Principal or Co-investigator on several research grants involving the treatment and prevention of HIV and other infectious diseases, as well as, the "COBRE" on overdose and Opioids. **The events of 2020 have led him to the forefront of COVID-19 research as he works to enable better conditions for those effected with the virus who have been incarcerated.**

**Ralph Rogers, MD** research interests include studying the intersection of infectious disease and immunology in immunocompromised hosts as well as the clinical application of novel assays of infectious disease diagnostics, COVID-19 and clinical trials.

**Francine Touzard Romo, MD**, research interests include HIV antiretroviral toxicity, orthopedic de-

## Immunology & Infectious Diseases (cont)

vices associated infections, antimicrobial stewardship and prevention of hospital acquired infections.

**Natasha Rybak, MD**, Research interests are in global health with a specific interest in tuberculosis (TB), HIV and TB, and multi-drug resistant (MDR) tuberculosis among adults and children in Eastern Europe. She helped to create the Brown University Ukraine Collaboration, a global health initiative program at Brown University to address these issues of TB, TB/HIV co-infection and MDR-TB in Ukraine. She serves as the Medical Director of the RISE TB Clinic and is co-founder of the Brown -Boston University Ukraine Collaboration- a collaborative clinical and research exchange between Brown University faculty and Ukrainian clinical and research leaders in HIV and TB to address the challenges of HIV, TB and HIV co-infection and MDR-TB in Ukraine through research and evidence -based medicine.

Also serves as an investigator under the leadership of Dr. Karen Tashima for The Miriam Hospital site of the AIDS Clinical Trial Group (ACTG). The ACTG investigates new therapies for HIV, Hep C, tuberculosis and now COVID-19.

**Martha Cristina Sanchez, MD**, Research interests include HIV - Care Continuum, Tropical Medicine, Global health. She oversees the Immunology Center Adherence and Retention Team (ICARE) that focuses efforts of re-engaging and maintaining HIV patients in care. She is the co-director of the Brown–Dominican Republic exchange program, a global health initiative involving medical residents and students as well as clinical research involving HIV infection and comorbidities in Santiago, DR.

**Karen T. Tashima, MD**, directs the NIH funded HIV Clinical Trial Unit at The Miriam Hospital to investigate new therapies for HIV, hepatitis C and novel approaches to HIV infection and its associated inflammatory state. She developed a national study to evaluate whether a class of antiretroviral medications should be included in regimens for patients with drug resistant virus.

**Edward J. Wing, MD**. Research Interests: These include Obesity and HIV and HIV and Aging. He has developed international health programs within the Department to improve both education and clinical research in the Dominican Republic, Haiti, Brazil and Kenya. These programs have developed innovative approaches to HIV diagnosis and treatment, but also seek to improve general medical care in both the inpatient and ambulatory settings. Currently, he is

working on long term effects of COVID-19, predictors of rehospitalization with COVID-19, Aging and HIV and Obesity and HIV.

## Kidney Disease & Hypertension

**Douglas Shemin, MD** is the director of the Division of Kidney Diseases and Hypertension. His primary clinical and research interests are renal replacement therapy and end stage kidney disease. His current research projects include novel treatments for anemia of chronic kidney disease, measurement of solute clearance in end stage renal disease, and the effect of dialysis time on outcomes in end stage kidney disease.

**Shougang Zhuang, MD** serves as the director of the Renal Diseases and Hypertension Division's laboratory research program. He is interested in the mechanisms of acute kidney injury and renal regeneration after injury, and in developing therapeutic agents that promote renal recovery after acute kidney injury (AKI) and that attenuate progression of renal fibrosis. His current projects are focused on determining the intracellular signaling events critical for renal tubular cell death and development of renal fibrosis after injury, as well as defining the role of epigenetic regulation in renal epithelial cell regeneration and renal fibrosis. His research has

He is also interested in determining the best post renal biopsy observation period. Too short a period will lead to some patients developing hypotension or painful hematomas after discharge; too long a period will lead to the inconvenience and expense of unnecessary hospitalization of mainly stable patients.

**Maroun Azar, MD** is interested in the role of palliative care in elderly patients with chronic kidney disease. Another interest is in outcomes in geriatric patients with end stage renal disease. He is also currently involved in a collaborative study on the incidence of acute kidney injury in women with preeclampsia in relation to NSAID use.

**George Bayliss, MDs'** research interests include learning whether there are ways to combine subjective and objective data to predict when someone

## Kidney Disease & Hypertension (cont)

will need to start dialysis or return to dialysis after the transplanted kidney fails and the use of immunosuppressant agents in the transplant patients with a failed kidney after return to dialysis.

**Nathan Calabro-Kailukaitis, MD** is interested in peritoneal dialysis and has collaborated on a project comparing procedure burden in a subset of peritoneal and hemodialysis patients. He also plans to participate in a project looking at inflammation as it relates to peritoneal membrane solute transport. A topic of potential interest is an examination of hemodialysis related outcomes at Moi Teaching and Referral Hospital in Eldoret, Kenya.

**Reginald Gohh, MD's** research focuses on clinical interventions to treat a variety of disorders in the general nephrology population as well to improve the outcomes of kidney transplant recipients. I am involved in several clinical trials studying novel pharmacologic therapies to treat a variety disorders such as ANCA positive vasculitis, membranous GN and primary FSGS. Other clinical interests include the investigation of patient risk factors that may influence renal allograft survival and looking at ways to mitigate these risks. For instance, we are currently studying the effect of exercise following transplantation to determine whether a pattern can be discerned that impacts graft outcomes. Other endeavors include an investigator-initiated trial to determine whether delayed graft function can be influenced by novel pharmacologic interventions in the peri-operative period.

**Yingjie Guan, MD** is interested in understanding of the pathogenic mechanisms of chronic kidney disease—mineral bone disorder as well as renal fibrogenesis and inflammation. The laboratory is currently focused on the role of posttranslational modifications such as protein methylation in the expression of renal proteins related to CKD-MBD regulation.

**Susie Hu, MD's** research interests include peritoneal dialysis, onconeurology and select kidney transplant-related topics. For the peritoneal dialysis research, we have examined the procedural burden between those who start dialysis with urgent start peritoneal dialysis versus urgent start hemodialysis. We also explore which factors are associated with preservation of residual renal function in peritoneal dialysis. We would also like to explore how the peritoneal membrane changes with time on dialysis and which factors impact out-

comes. We are also participating in the peritoneal dialysis registry examining peritoneal dialysis catheter insertion method related outcomes. Topics of interest in transplant include— donor kidney volume and donor GFR outcomes. We hope to also explore how kidney volume or size may impact patients with renal cell carcinoma who undergo nephrectomy.

**Eric Kerns, MD's** research interests include acute kidney injury in patients with cirrhosis, peritoneal dialysis (specifically urgent-start peritoneal dialysis), and Mesoamerican nephropathy and CKD in immigrant populations.

**Matthew Lynch, MD's** research interests include treatment of glomerular disease, changes in the peritoneal membrane over time in patients on peritoneal dialysis, and treatment of acute kidney injury in critically ill patients. He is currently the site PI on a large study examining a novel medication in the treatment of lupus nephritis and overseeing the construction of our local glomerulonephritis registry. He is collaborating with Drs. Hu, Shah, and Calabro on the peritoneal dialysis registry and peritoneal membrane changes.

**Basma Merhi, MD** is a transplant nephrologist who has led a number of projects arising from the FAVORIT study, the largest clinical trial ever funded by the NIH in renal disease, which was run by our division's faculty. These projects have included calcium and phosphate metabolism in renal transplant recipients, and cardiovascular disease in renal transplant recipients.

**John O'Bell, MD** is interested in the use of novel educational tools to improve learning for fellows, residents, and students. He is also involved in research about risk factors for recurrent kidney stones. He oversees the CKD initiative, which is a collaborative project between primary care and nephrology to improve efficiency and quality of care in patients with advanced stages of chronic kidney disease.

**Kelley Sanzen's** research interests include hypertension management, medication adherence, decreasing polypharmacy, quality improvement, health literacy, and evolving interprofessional models of care. She is currently collaborating with Dr.

## Kidney Disease & Hypertension *(cont)*

Shah to evaluate the impact of implementing a pharmacist-managed erythropoietin stimulating agent stewardship project in non-dialysis Chronic Kidney Disease patients in 2016. In addition, she is working on a grant funded project focused on optimizing medication management in dialysis patients by understanding patient perceptions about medications through pharmacist semi-structured interviews and comprehensive medication reviews. Other quality improvement activities include interprofessional management of mineral bone disease in dialysis patients, evaluating nephrologist prescribing patterns of SGLT2 inhibitors in patients with preserved renal function and CKD, and implementation of remote blood pressure monitoring using telehealth during the COVID-19 pandemic.

**Ankur Shah, MD's** research interests include peritoneal dialysis, home hemodialysis, and quality improvement. He is currently collaborating with Dr. Hu on projects looking at how the peritoneal membrane changes with time on dialysis and which factors impact outcomes as well participating a registry examining peritoneal dialysis catheter insertion method related outcomes. His second interest is in the efficacy of quality improvement activities, we are currently reviewing the durable outcomes of an erythropoietin stewardship protocol implemented in 2016.

**Jie Tang, MD** is actively conducting epidemiological and prospective trials in kidney stone disease. The projects include studying the effects of dietary factors in various outcomes among prevalent as well as incident kidney stone formers, and the role of vitamin D, fibroblast growth factor 23 and klotho in the pathogenesis of kidney stone disease. Dr. Tang also leads a clinical study examining the cardiovascular biomarkers among CKD patients with obstructive sleep apnea.

**Uttam Bhetuwal** is a newly hired Biostatistician at the department of Kidney and Hypertension. He also partly works for Lifespan BERD core. He is involved in helping medical students, research interns, residents, fellows and nephrologists with clinical trial design, sample size calculation, statistical analysis, and other research related tasks. He is also interested in working with MDs for the federal and state level grants application. His research interest lies in N of 1 trials, Bayesian Data Analysis and causal inference.

## Pulmonary, Sleep Disorders & Critical Care

### Overview

We have many ongoing funded research projects in a wide variety of fields both within our own division and through collaboration with other divisions and departments in the Brown research community. Our Brown Respiratory Research Training Program (T32) is a demonstration of our commitment to mentoring young investigators in pulmonary, critical care, and sleep medicine.

**Active Areas of Research Include:** Sepsis (mechanisms and treatment, Knowledge translation, Acute lung injury, Pulmonary vascular disease (mechanisms and treatment), Pulmonary vascular permeability and endothelial dysfunction, Extracorporeal life support, Sleep medicine, Systemic vascular co-morbidities of COPD, Tuberculosis/NTM, End-of-life care in the ICU, Ethical and practical aspects of rationing medical care, Health-related quality of life, Role of Stem Cells, progenitor cells and extracellular vesicles in lung injury repair, Pulmonary fibrosis and interstitial lung diseases

### The Brown Respiratory Research Training Program (T32 HL134625 01)

The Brown Respiratory Research Training Program has as its overall objective the training of physicians and scientists to become independent investigators in the pathobiology of respiratory diseases and in the health services, outcomes, and epidemiology of these diseases. The Program aims to bridge gaps between biomedical, behavioral and public health disciplines to advance knowledge regarding how best to reduce disease burden among patients with diseases that affect the respiratory system.

### Knowledge translation in sepsis

**Mitchell Levy MD** (Division Chief) is conducting work on performance improvement techniques and has been working with The Surviving Sepsis Campaign to improve the survival of sepsis. He has conducted several trials, testing the impact of these "sepsis bundles" and a multiple-faceted intervention in facilitating knowledge transfer. In partnership with the Institute for Healthcare Improvement (IHI), two sepsis bundles were developed in 2004, and revised in 2015 and 2018. His work with the New York State Sepsis Initiative was published (2017 and 2018) in the New England Journal of Medicine and the American Journal of Respiratory and Critical Care Medicine. A study on racial disparities from the New York State database was published (2019) in Health

## Pulmonary, Sleep Disorders & Critical Care (cont)

Affairs. He continues to access the 150,000 patient NYS DOH database to work with fellows and other collaborators on further manuscripts. This includes: 1) Impact of sepsis bundles on patients with chronic kidney disease and congestive heart failure, 2) Development of sepsis phenotypes from clinical data, and 3) Readmission rates and unintended consequences of sepsis performance measures.

### Sepsis

Our division has a long history of research into the causes and treatment of sepsis. Dr. Mitchell Levy has been a leader in the creation of international professional organization-based sepsis guidelines for over 20 years and the co-director of the Ocean State Clinical Coordinating Center, which manages large, multi-center international RCTs in sepsis. There is significant expertise in the division around developing protocols for large sepsis RCTs. We have also been involved in national and State-wide initiatives in sepsis performance improvement programs and are major contributors to the national SEP-1 mandated reporting with sepsis measures.

### Biobank

**Mitchell Levy MD and Corey Ventetuolo MD** are amassing a database for all patients admitted to the Medical Intensive Care Unit with sepsis and ARDS. Blood is being collected for Proteomic and Genomic evaluation, and have multiple research projects (collaborating with fellows and faculty from other departments) utilizing samples from this database

### Health services ICU research

**Mitchell Levy MD** is examining large data sets of severely septic patients (Centers for Medicare and Medicaid services) to determine the viability of a disease-specific risk-adjusted mortality model in patients with severe sepsis and septic shock. Using recursive partitioning and regression analysis, statistical correlations with these features are being identified. The aim is to generate a predictive model incorporating these factors to identify mortality risk. These efforts are in collaboration with Stan Lemeshow and Gary Phillips, from Ohio State University School of Biostatistics.

**Nicholas Ward, MD** is currently working two studies of ICU utilization and practice. The first focuses on informed consent in ICUs and is part of multi-center study looking at this issue based out of Brown, the University of Chicago, and Beth Israel Deaconess Hospital. The second project is a quantitative and

qualitative analysis of ICU admissions for non-critically ill patients using a data base created at Rhode Island hospital. This project is being done in conjunction with **Dr. Jason Aliotta**.

**Jason Aliotta, MD** is involved in several quality improvement projects that focus on ICU utilization and physician workflow and staffing at Rhode Island Hospital Medical ICU. In addition, he is the principal investigator in a funded randomized control trial that evaluates the utilization and effectiveness of breath-actuated nebulizers compared with standard nebulizers in patients admitted with acute COPD exacerbations.

### End-of-life care

Our division has been involved in multiple research projects for improving end of life care in the critically ill and improving communication for caregivers during end of life conversations. **Dr. Nicholas Ward** has a special interest in ethics and has also led several initiatives for physician/patient ratios in the ICU and well as decision-making during the COVID-19 pandemic. **Mitchell Levy MD** is continuing his work in end-of-life care. Over the past years, he has published numerous manuscripts in the field, including one on the visiting hours in the MICU, as well as several opinion pieces, describing the barriers to adequate end-of-life decision-making. Dr. Levy has completed a state-wide initiative on communication bundles in the ICU (with a research fellow as lead author) the results of which have been published in Critical Care Medicine.

### Extracorporeal life support

Rhode Island Hospital is an Extracorporeal Life Support Organization Center of Excellence. **Corey Ventetuolo, MD, MS** is the Medical Director of the Adult Extracorporeal Life Support Program. The research mission of the ECLS service includes participation in registries and biorepositories, collaboration with the Center for Biomedical Informatics at Brown to apply machine learning algorithms to predict outcomes in ECLS (Adeel Abasi, MD/T32 graduate), translational studies of novel biomarkers, and work in best practice for anticoagulation monitoring modalities.

Rhode Island Hospital is a site for a randomized clinical trial of extra corporeal carbon dioxide removal (ECCO<sub>2</sub>R). Drs. Levy and Ventetuolo are co-principal investigators for this study.

### Pulmonary vascular disease

The Rhode Island Hospital Pulmonary Hypertension Center (RIHPHC) was established in 1991 and has been under the leadership of Dr. James Klinger since 2001 also includes Drs. Corey Ventetuolo (Associate Director), Christopher Mullin, MD, MHS and Mary Whittenhall, MSN, APRN, AGACNP (Center Coordinator). The RIHPHC was the first center in New England to be accredited as a Center of Comprehensive Care by the Pulmonary Hypertension Association. The Center participates in numerous clinical trials of new and approved therapies for the treatment of pulmonary arterial hypertension (PAH) and is currently enrolling patients in several NIH- and Industry-funded clinical trials. The RIHPHC also regularly enrolls patients in national registries and the NIH PAH biobank.

Dr. Klinger's research is concentrated on the pathobiology of pulmonary vascular remodeling in pulmonary hypertension and pulmonary vascular endothelial barrier function. In collaboration with Drs. Peter Quesenberry and Olin Liang at the Rhode Island Center for Stem Cell Biology, Dr. Klinger has been investigating the role of mesenchymal stem cell extracellular vesicles and bone marrow-derived progenitor cells in the pathogenesis and treatment of pulmonary hypertension. Dr. Klinger's interests also include several newly identified transcription factors that have recently been implicated in pulmonary vascular disease. Dr. Klinger's other research interests include the natriuretic peptides, nitric oxide and downstream signaling mechanisms that are regulated by cGMP and cGMP-dependent protein kinase. His interest in these pathways is related to their role in modulating pulmonary hypertensive and right ventricular hypertrophic responses, as well as pulmonary endothelial barrier function.

Dr. Ventetuolo's research includes both clinical and translational studies focused on the genetic and molecular mechanisms of sex hormone signaling and metabolism as a means for understanding sexual dimorphism in PAH and right ventricular function in health and disease. She serves as study co-chair for an NIH-funded clinical trial of anastrozole in PAH and is the Principal Investigator of the EDIPHY Study, the first NIH-funded clinical trial of a naturally occurring hormone, dehydroepiandrosterone, in PAH. Active collaborations include pulmonary artery endothelial cell phenotyping with Elizabeth Harrington, PhD and the Center for Stem Cell Biology, and quality of life research with Kate Guthrie, PhD in the Center for Behavioral and Preventative Medicine at Brown.

Dr. Mullin's research is focused on PAH related to systemic sclerosis (SSc) and other forms of connective tissue disease (CTD). He has ongoing clinical research projects examining and predicting outcomes and hospitalizations in SSc-PAH and CTD-PAH. He has interest and expertise in the use of pulmonary vascular responses to exercise (measurement of cardiopulmonary hemodynamics with exercise during right heart catheterization) to identify early pulmonary vascular disease in SSc and other patient populations at-risk for PAH.

### Venous thromboembolism

Led by **Dr. Christopher Mullin** and in conjunction with interventional radiology, emergency medicine, cardiothoracic surgery and cardiology, the Pulmonary Division has developed and plays an integral role in the **Pulmonary Embolism Response Team (PERT)** that evaluates all cases of pulmonary embolism (PE) admitted to Rhode Island Hospital. Dr. Mullin also oversees a **Post-PE Clinic** as part of the RIHPHC which includes an active population of patients with chronic thromboembolic pulmonary hypertension (CTEPH).

### Interstitial Lung Disease Center

The Brown Medicine-Rhode Island Hospital Interstitial Lung Disease (ILD) Center was established by **Dr. Barry Shea** in 2014 to provide comprehensive care to those afflicted by these complex and often life-threatening diseases. The Brown-RIH ILD Center has grown steadily and includes active research, educational and community support programs to compliment a multidisciplinary approach to patient care. In 2018 it was selected as a member of the Pulmonary Fibrosis Foundation (PFF) Care Center Network. Dr. Shea focuses on clinical and translational research in idiopathic pulmonary fibrosis (IPF) and other fibrosing ILDs. He has active NIH funding to investigate the use of a novel molecular imaging technique – fibrin positron emission tomography (Fibrin-PET) – to assess ongoing lung injury in idiopathic pulmonary fibrosis (IPF). He is a co-investigator on an NIH-sponsored project study to assess the ability of bronchoscopic optical coherence tomography (OCT) to noninvasively diagnose IPF and other ILDs. He is also the site principal investigator for several industry-sponsored clinical trials in IPF, and he has established local and national collaborations with other investigators in the field. He has mentored several pulmonary and critical care fellows during the research portions of

their training.

### Global Health

**E. Jane Carter, M.D.**, has a primary interest in Tuberculosis- both domestically and internationally. Dr. Carter is the co-director of the HIV-TB Scientific Working Group of the Providence Boston Center for AIDS Research (CFAR). Dr. Carter has headed the Brown Kenya Program medical exchange program (<http://brownmedicine.org/kenya/>) for 20 years which also contains a broad scope of research projects and opportunities. Her most recent research project has focused on pediatric TB diagnosis and treatment in high burden, resource poor countries, such as Kenya. She is also a co-founder of the Pulmonary Critical Care Training Program at Black Lion Hospital in Addis Abba, Ethiopia.

### Vascular Research Laboratory, Providence VA Medical Center

The Vascular Research Laboratory (VRL) is a multidisciplinary group of investigators studying the pulmonary circulation and cardiopulmonary interactions using cells, animal models, clinical studies, and epidemiology studies using database approaches. Faculty include MD's, PhD's, pulmonary/critical care and cardiology specialists. Research is multidisciplinary with a focus on diseases resulting in pulmonary edema, pulmonary hypertension, and cardiac complications of pulmonary hypertension. The VRL faculty cumulatively have over \$2.3 million in direct costs per year of funding to support their research. In addition, the VRL is the site of the Cardio Pulmonary Vascular Biology Center for Biomedical Research Excellence (CPVB COBRE) with has \$1.5 million in direct costs per year.

Websites: [www.brown.edu/Research/Vascular\\_Research\\_Laboratory](http://www.brown.edu/Research/Vascular_Research_Laboratory); [www.cpvb.org](http://www.cpvb.org)

**Gaurav Choudhary, MD**, is Chief of Staff for Research at the PVAMC. The focus of research in his laboratory is to evaluate the mechanisms underlying exercise intolerance, vascular dysfunction and cardiac dysfunction seen in pulmonary vascular diseases. The laboratory uses a variety of in vitro, ex vivo and in vivo approaches utilizing the preclinical models of pulmonary hypertension and emphysema. His NIH-funded research is focused on mechanisms of right ventricular fibrosis in pulmonary hypertension. He also performs epidemiological (using VA and non-VA data) and clinical studies in area of pulmonary hypertension and right heart function. He is site PI with Jankowich on a VA-funded Merit Review grant to study the effects of tadalafil on pulmonary hypertension associated with COPD, lung vascular remodeling,

and RV dysfunction. Dr. Choudhary is funded by an RO1 and collaborates with Drs. Clements, Jankowich, Harrington, Lu, Rounds, and Wu.

**Richard Clements, PhD**, is expert in microvascular injury in diabetes and in mitochondrial function and collaborates with Choudhary.

**Elizabeth Harrington, PhD**, is PI on the Brown Respiratory Research T32 Training Program. Dr. Harrington is PI or co-PI on three training grants that support undergraduate, medical student, and graduate student research. The focus of her research is characterization of intracellular signaling mechanisms regulating endothelial cell functions and/or responses to environmental cues. Current investigations include elucidation of the molecular mechanism by which NRP and Rab GTPases regulate endothelial monolayer permeability and apoptosis and elucidation of signaling pathways which are differentially activated in pulmonary and systemic microvascular endothelial cells in response to oxidative stress.

**Matthew Jankowich, MD**, studies conditions predisposing to pulmonary hypertension and RV failure with a focus on non-PAH PH, and also studies the interactions between systemic vascular disease and pulmonary vascular disease. He has been conducting epidemiologic research with cardiologists Gaurav Choudhary, M.D. and Wen-Chih Wu, M.D. using data from the Jackson Heart Study (JHS), the largest prospective observational study of cardiovascular disease in African-Americans. Brown University is a Vanguard data center for the JHS. Dr. Jankowich is a site investigator for the Tadalafil for Pulmonary Hypertension Associated with Chronic Lung Disease (TADA-PHILD) multicenter randomized double-blind placebo-controlled clinical trial (co-PI Dr. Sharon Rounds). He is also a site investigator for the OPTIMAL-HF study (PI: Dan Gottlieb, M.D., Boston VAMC), a randomized parallel group study comparing CPAP, oxygen, or optimized medical therapy for patients with sleep apnea and chronic heart failure with a reduced ejection fraction.

**Sharon Rounds, MD**, is interested in mechanisms of lung vascular injury in conditions causing pulmonary hypertension and acute lung injury. Her work focuses on mechanisms of lung endothelial cell injury. Current work in the laboratory focuses on the effects of cigarette smoke exposure on endothelial monolayer and pulmonary microvascular permeability. Dr. Rounds mentors in the

## Pulmonary, Sleep Disorders & Critical Care (cont)

area of endothelial cell injury and dysfunction, pulmonary edema, and pulmonary hypertension. Dr. Rounds is funded by the VA Merit Review to study cigarette smoke effects on lung function and by a second VA Merit Review to study the effects of Tadalafil on pulmonary hypertension associated with COPD. Sharon Rounds is PI of the Pilot Projects Program of the Advance Clinical Translational Research Program. She is PI of the CPVB COBRE, a \$10 million, 5-year grant to develop research on Cardio Pulmonary Vascular Biology. She collaborates with Drs. Choudhary, Harrington, and Lu.

**Wen-Chih (“Hank”) Wu, MD, MPH**, is an Investigator in the Center of Innovation in Long-Term Services and Supports for Vulnerable Veterans (COIN) at the PVAMC. Dr. Wu studies the relationship between anemia, blood transfusion and death in elderly patients undergoing non-cardiac surgery and delivery of care to patients with CHF. In collaboration with Drs. Choudhary and Jankowich, he also studies factors predisposing to pulmonary hypertension and RV failure. He is funded by VA Merit Review grants. He mentors in the areas of epidemiology and outcomes of pulmonary hypertension and CHF.

**Linda Nici, MD** (Section Chief) is conducting work on interventions to improve patient-centered outcomes in COPD. Through the Pulmonary Rehabilitation Program as well as the Pulmonary Risk Reduction Initiative, COPD patients at risk for hospital admission or readmission are receiving additional health provider support through education initiatives, promotion of exercise, and identification of risk factors that can be modified to prevent hospitalizations. Studies have included: 1) Rates and predictors of hospital readmission among patients with COPD in the Department of Veterans Affairs using the national VINCI database; 2) The trajectory of physical activity following pulmonary rehabilitation; 3) Physician-led education interventions designed to prevent readmission after COPD exacerbation. In addition, the VA has a robust lung cancer screening program which includes a patient registry of all positive screens. This has allowed for evaluation of interventions for positive screens as well as survival data for veterans with lung cancer.

**Eric Gartman MD** has research interests in airway disease, diaphragmatic dysfunction and exercise limitation. He is currently the principle investigator for a study evaluating the use of Cardiopulmonary Exercise Testing (CPET) in predicting outcomes after cancer diagnosis and treatment, as well as a collaborator in other clinical research studies using CPET as an out-

come measure. He is a site co-investigator in the OPTIMAL-HF study above.

**Lung Cancer Screening Program:** The Providence VAMC implemented a clinical lung cancer screening program using LDCT starting in December 2013. We are currently evaluating the utility of lung cancer screening in the first years of implementation in terms of: rates of nodule detection and workup; prevalence of lung cancer at initial screening; sensitivity and specificity of lung cancer screening at the Providence VAMC; and outcomes of lung cancer diagnosis in the screened population compared to the pre-screening population.

### Sleep Medicine

**Richard P. Millman MD.** The relationship between obstructive sleep apnea and chronic renal disease is being pursued with a large grant to Brown from an anonymous donor. This study is trying to determine the relationship between stage 4 chronic renal disease, sleep disordered breathing, 24-hour blood pressure measurements and markers of potential cardiac disease. This is being done in conjunction with the Division of Renal and Hypertension in the Department of Medicine

**Katherine Sharkey MD, PhD.** studies the interplay between mood regulation, circadian rhythms, and sleep. In addition, she is a Co-PI with Dr. Elizabeth Harrington on a T35 from NHLBI that supports medical student research. Sharkey leads a 4-site randomized controlled trial testing a chronotherapy intervention for treatment of perinatal depression with colleagues from Northwell Health, Johns Hopkins University, and the University of North Carolina-Chapel Hill. Her other projects include a study of maternal sleep patterns, perinatal weight gain and infant feeding in Latinx families in collaboration with colleagues from the School of Public Health and the Hassenfeld Institute, and a pilot intervention for improving sleep in women with newly diagnosed ovarian cancer with faculty at Women and Infants Hospital. Sharkey’s lab examines multiple factors associated with circadian rhythms and mood regulation, including wrist actigraphy, ambulatory EEG monitoring, measures of hyperarousal, cognitive processing, hormone levels, biomarkers, and infant behaviors. Dr. Sharkey’s other scholarly interests include sleep disorders and women’s health and advancement and leadership among women in academic medicine.

## Rheumatology

**Katarzyna Gilek-Seibert, MD** – Interests are in medical education and innovation in medical education and patient care delivery. She is interested in digital technology and collaborates with URI School of Pharmacy on educational materials for patients. This collaboration includes fellows and students. Dr. Gilek clinical interest is broad and includes RA and PsA.

**Deepan S. Dalal, MD** is a clinical epidemiologist and is interested in health services and outcomes research. He is particularly interested in systematic reviews and observational studies focussing on Rheumatoid Arthritis. He is currently using the Medicare database to evaluate outcomes of importance to geriatric patients with RA. During his tenure at Brown, he has also created a Lifespan ED cohort of gout patients and participated in quality assessment projects.

**Anthony M. Reginato, PhD, MD** is interested in the role of musculoskeletal ultrasound in the diagnosis and management of rheumatic diseases. He is currently involved in educational and certification programs in Pan American League Against Rheumatism (PANLAR). Application of musculoskeletal ultrasound in crystal-induced arthritis and spondyloarthropathies. Another interest is evaluating the role of lubricin (PRG4) in regulating the inflammatory response in gout. He is also currently involved in evaluating the effect of aging hematopoiesis and the role of Myeloid-Derived Suppressor Cells (MDSCs) in the development and treatment of rheumatoid arthritis (RA).