PRECISION MEDICINE

Faculty Profiles

JOHNS HOPKINS UNIVERSITY

JOHNS HOPKINS TECHNOLOGY VENTURES

SRINIVASAN YEGNASUBRAMANIAN, MD, PHD

Associate Professor, Oncology; Director of Next Generation Sequencing, Johns Hopkins Kimmel Cancer Center; Co-director, Kimmel Cancer Center's Experimental and Computational Genomics Core

RESEARCH AREAS

Androgen receptor signaling, Cancer biomarkers, Epigenetic modulators for cancer therapy., Interplay of cancer epigenetics and genetics, Role of TOP2 in transcription and genomic instability

SUMMARY OF WORK

Dr. Yegnasubramanian focuses on harnessing the power genomics and epigenomics technologies and analyses to carry out basic-translational cancer research. He has led research efforts using genomics technologies and computational biology to better understand the complex interplay between genetic and epigenetic alterations in driving carcinogenesis and disease progression, and on exploiting this understanding in developing novel biomarkers for diagnosis and risk stratification as well as in identifying targets for therapeutic intervention.

PUBLICATIONS

- Bipolar androgen therapy plus nivolumab for patients with metastatic castration-resistant prostate cancer: the COMBAT phase II trial.
- CD4 T cell-activating neoantigens enhance personalized cancer vaccine efficacy.
- Precision Oncology Core Data Model to Support Clinical Genomics Decision Making.

BRIAN HASSELFELD, MD

Senior Medical Director, Digital Health and Innovation at Johns Hopkins Medicine; Associate Director of Johns Hopkins inHealth; Internal medicine and Pediatrics physician at Johns Hopkins Community Physicians

RESEARCH AREAS

Economic evaluation, Health care policy, Health equity, Health insurance, Informatics and information technology, Telehealth

SUMMARY OF WORK

Dr. Hasselfeld is the current Medical Director, Digital Health and Telemedicine at Johns Hopkins Medicine, focusing on digital health, virtual care, and clinical innovation. He also serves as a primary care physician in Internal Medicine and Pediatrics for Johns Hopkins Community Physicians. In addition, he serves on the Board of Directors for a regional Medicare Advantage insurance plan. In addition to his medical training in internal medicine and pediatrics completed at Harvard's Brigham and Women's Hospital and Boston Children's Hospital, he has experience in investment banking, entrepreneurship, and technology innovation.

PUBLICATIONS

- Individual- and Neighborhood-Level Disparities in Audio-Only Telemedicine Utilization Across a Large Academic Health System.
- Provider Perspectives Regarding Ambulatory Telemedicine at a Large Academic Health System During the COVID-19 Pandemic.
- Identification of Racial Inequities in Access to Specialized Inpatient Heart Failure Care at an Academic Medical Center.

JOSEPH C. MURRAY, MD, PHD

Assistant Professor of Oncology at the Sidney Kimmel Comprehensive Cancer at Johns Hopkins in the Upper Aerodigestive Cancer Division (UAD); Co-Director of the Lung Cancer Precision Medicine Center of Excellence (PMCOE)

RESEARCH AREAS

Cell and molecular biology, bioinformatics techniques, immuno-modulatory therapeutics in thoracic cancer

SUMMARY OF WORK

Dr. Murray conducts translational research in cancer genomics, liquid biopsy, and immunology in non-small cell lung cancer. He also has expertise in antibody-based immunotherapy, molecular and cell biology, and bioinformatics. He integrates research through the Lung Cancer PMCOE and UAD Immunotherapy Database to conduct observational clinical studies in real-world populations of patients with thoracic cancer. He cares for patients primarily at the Johns Hopkins Sidney Kimmel Comprehensive Cancer Center at Bayview Medical Center.

PUBLICATIONS

- Gene - maltreatment interplay in adult ADHD symptoms: main role of a gene-environment correlation effect in a Brazilian population longitudinal study.
- Unique and shared risk factors for early childhood victimization and polyvictimization in a Brazilian population-based birth cohort.
- Adverse childhood experiences and crime outcomes in early adulthood: A multi-method approach in a Brazilian birth cohort.

LORI VANSCOY, MD

Assistant Professor, Pediatrics; Medical Director, Johns Hopkins inHealth; Co-Director Cystic Fibrosis Precision Medicine Center of Excellence

RESEARCH AREAS

Cystic Fibrosis, Precision Medicine, Non-tuberculous Mycobacterium Infection, Pediatric Pulmonary Medicine

SUMMARY OF WORK

Dr. Vanscoy leads research focused on the application of precision medicine in cystic fibrosis (CF) care. She is working with engineering colleagues to use a sweat sensor developed at Johns Hopkins to measure sweat chloride concentrations in children with CF during exercise, with the long-term goal of incorporating this device into a home surveillance program to monitor modulator drug response. A second aim of Dr. Vanscoy's research is the creation of a CF "fingerprint" using available CFTR genetic information coupled with granular data from the electronic medical record, which will be extracted and categorized using machine learning techniques, including natural language processing. This fingerprint, which is designed to capture the complexity and heterogeneity of the CF phenotype, will inform individualized treatment decisions and provide a robust phenotype for future clinical research.

PUBLICATIONS

– Clinical outcomes in cystic fibrosis at 6 years of age with tricare insurance coverage.
– Long term effects of denufosol tetrasodium in patients with cystic fibrosis.

ANTONIO TRUJILLO, PHD

Associate Professor, International Health

RESEARCH AREAS

Health Economics; Health Systems; Economics of Chronic Conditions; Aging; Diabetes; Individualized Medicine; Fairness in Prescription Drug Prices; Generic Drugs; Biosimilars; Program Impact Evaluation; Econometrics; Causal Inference; Latin American Countries

SUMMARY OF WORK

Dr. Trujillo has studied the role of intrinsic and extrinsic motivation on preventive behavior of patients with chronic conditions. His goal is to incorporate individual information on personality in the design of public health programs to increase treatment adherence among individuals with diabetes and hypertension. Currently, he is exploring how an economic view of fairness can inform drug regulation. He is also evaluating health systems policies to increase access to generic drugs and biosimilars.

PUBLICATIONS

- Suggesting global insights to local challenges: expanding financing of rehabilitation services in low and middle-income countries.
- Design of an innovative digital application to facilitate access to healthy foods in low-income urban settings.
- Exploring the Influence of Health Insurance Plans on Biosimilar Adoption Rates.

RAMA CHELLAPPA, PHD

Bloomberg Distinguished Professor in electrical and computer engineering and biomedical engineering and chief scientist at the Johns Hopkins Institute for Assured Autonomy

RESEARCH AREAS

Computer vision, artificial intelligence, pattern recognition, image and signal processing, machine learning, and biometrics

SUMMARY OF WORK

Dr. Chellappa's research has shaped the field of facial recognition technology—developing detailed face models based on shape, appearance, texture, and bone and muscle structure. Under a recent program called Janus, he and his team have developed a high-accuracy face recognition system that serves critical needs for federal and commercial sectors. The team has also worked on modeling facial expressions, with potential for a variety of medical applications.

He also is known as an expert in machine learning, a branch of artificial intelligence that instructs computer systems to perform tasks based on patterns and inferences. In one recent experiment, Dr. Chellappa and colleagues tested the skills of expert forensic facial examiners against the skills of machines; as it turned out, the best results came when both sides worked together. This research has implications for how machine learning algorithms can help doctors diagnose disease. Dr. Chellappa has also worked on gait analysis, which can apply to an enormous range of uses—everything from diagnosing Parkinson's disease to human identification at a distance.

PUBLICATIONS

- Artificial intelligence and technology collaboratories: Empowering innovation in AI + AgeTech.
- Artificial Intelligence and Technology Collaboratories: Innovating aging research and Alzheimer's care.
- The promise of AI and technology to improve quality of life and care for older adults.
- Next-generation deep learning based on simulators and synthetic data.

ELLEN MOWRY, MD

Director, Multiple Sclerosis Experimental Therapeutics Program; Professor of Neurology

RESEARCH AREAS

Neurology, multiple sclerosis (MS), epidemiology

SUMMARY OF WORK

Dr. Mowry has worked primarily to perform epidemiologic investigations of multiple sclerosis (MS) risk and prognostic factors and has evaluated both genetic and environmental contributors. While she has had a major role in several such studies, her most significant work led to the identification of the association of vitamin D status with relapse and brain lesion risk in patients with MS (Annals of Neurology 2010, Annals of Neurology 2012, European Journal of Neurology 2015). She also conducted the first pilot study comparing gut bacterial populations in patients with MS and healthy individuals (Journal of Investigative Medicine 2014).

She was recently funded to investigate the impact of vitamin D supplementation on the metabolomics profile in patients with MS compared to healthy controls. She enjoys designing and conducting clinical trials in MS and is the Principal Investigator of the Vitamin D to Ameliorate Multiple Sclerosis (VIDAMS) multicenter vitamin D trial (NCT01490502), which is sponsored by the National MS Society and a smaller multicenter pilot study investigating vitamin D pharmacokinetics in MS patients and healthy controls (NCT01667796).

PUBLICATIONS

- Structural MRI measures are associated with fatigue severity and persistence in a large, real-world cohort of people with multiple sclerosis.
- Association between demographics, socioeconomics, and disease-related factors and the perception of stigma in people with MS.
- Deep gray matter substructure volumes and depressive symptoms in a large multiple sclerosis cohort.

PAUL NAGY, PHD

Associate Professor of Radiology and Radiological Science; Deputy Director, Johns Hopkins Medicine Technology Innovation Center; Director of Education, Biomedical Informatics and Data Science Graduate Training Programs

RESEARCH AREAS

Developing biomarkers from medical imaging to enable real world reproducible evidence for observational research.

SUMMARY OF WORK

Dr. Nagy's work involves partnering with clinical inventors to create novel patient centric IT solutions at Johns Hopkins Medicine Technology Innovation Center (TIC). This team of 50 designers, developers, and data scientists work with inventors to build, deploy, and evaluate digital health solutions within the Johns Hopkins Medical System.

Dr. Nagy is a past chair of the Society of Imaging Informatics in Medicine and the American Board of Imaging Informatics as well as the past president of the College of SIIM Fellows. He received his PhD in Medical Physics from the Medical College of Wisconsin and is the author of over 130 papers in the fields of informatics and implementation science.

PUBLICATIONS

- Similar Risk of Kidney Failure among Patients with Blinding Diseases Who Receive Ranibizumab, Aflibercept, and Bevacizumab: An Observational Health Data Sciences and Informatics Network Study.
- Multinational patterns of second line antihyperglycaemic drug initiation across cardiovascular risk groups: federated pharmacoepidemiological evaluation in LEGEND-T2DM.
- Health Disparities in Lapses in Diabetic Retinopathy Care.

CHRISTIAN PAVLOVICH, MD

Professor of Urology; Director of the Prostate Cancer Active Surveillance Program and Fellowship; Director of Urologic Oncology for the Brady Urological Institute

RESEARCH AREAS

Early detection of prostate cancer and prostatic disease, Minimally-invasive surgery, Prostate cancer, Prostatic disease, Urinary biomarkers

SUMMARY OF WORK

Dr. Pavlovich's clinical focus is on prostate cancer, kidney cancer, and associated disorders, and on clinical trials regarding cancer detection and cancer immunotherapy. He is experienced in performing open, laparoscopic and other minimally invasive surgeries for the management of urologic tumors, including nerve-sparing and robot-assisted laparoscopic radical prostatectomy, laparoscopic and robotic nephrectomy, nephroureterectomy, and partial nephrectomy, and robotic radical cystectomy. In addition, he offers patients active surveillance and ablative options for their urinary malignancies including cryotherapy and prostate laser ablation.

PUBLICATIONS

- Urologist-level variation in the management of T1a renal cell carcinoma: A population-based cohort study.
- Prostate Cancer Radiological Estimation of Change in Sequential Evaluation (PRECISE) Magnetic Resonance Imaging Scoring to Predict Clinical Outcomes in Active Surveillance for Grade Group 1 Prostate Cancer.
- Clinical Significance of Perineural Invasion in Men With Grade Group 1 Prostate Cancer on Active Surveillance.

JOHNS HOPKINS INHEALTH

The inHealth Precision Medicine Initiative at Johns Hopkins is bringing together revolutions in measurement, connectivity, and data science to enable the discovery of clinically-relevant and biologically-anchored subgroups at scale.

Experienced clinicians see patterns in subgroups of patients that are similar in some way. They can adjust treatment based on what has worked on similar patients in the past, resulting in better outcomes.

We want to enable you to find and validate those subgroups faster, by providing more data, more efficiently, along with the tools to analyze it all. We give you the tools to find the underlying mechanisms. And we help you quickly put those discoveries back into clinical care.

PRECISION MEDICINE ANALYTICS PLATFORM (PMAP)

JOHNS HOPKINS TECHNOLOGY VENTURES

Continuous Learning System

The Discovery Platform brings your data and analytical tools together, for you to accelerate the process of discovery and answer your scientific questions more efficiently than ever before.

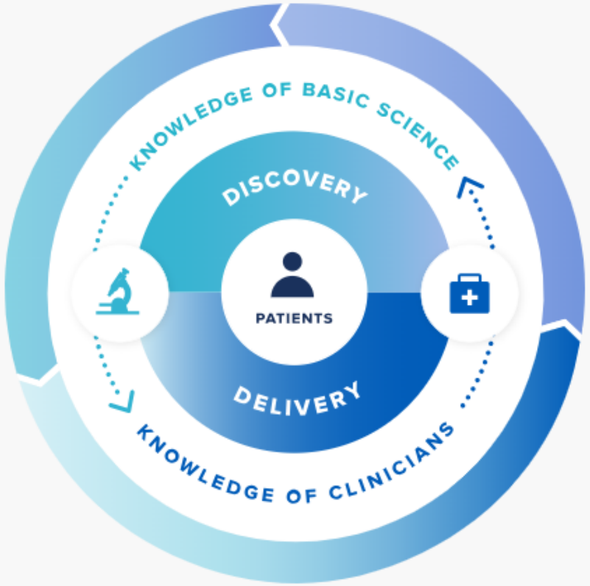
Discovery Platform

Bring Your Data Together

Clinical notes, labs, patient-reported outcomes, imaging, gene sequences, your own research data, and more are linked together, turned into limited data sets, and hosted in an approved, centrally-managed location.

Modern Analytical Tools

Access the data sets through statistical analysis tools or machine learning environments, and apply computational horsepower from on-premise or commerical partners. The PMAP Discovery Platform will help you answer your scientific questions more efficiently than ever before.



Delivery Platform

Build a Prototype

When your discoveries are validated, we will partner with you to implement them in a clinical care setting throughout the Johns Hopkins Health System and beyond.

Bring Technology into the Clinic

The PMAP Delivery Platform includes live data feeds, data visualizations, and predictors, built on a modern technology stack.