

ANNUAL REPORT FY 2021

ADVANCING RESEARCH IN MATERNAL AND CHILD HEALTH



Advancing research to solve the greatest health challenges facing pregnant women and children

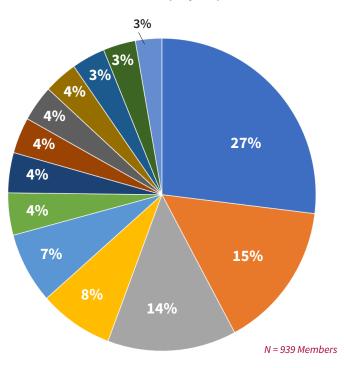
The Stanford Maternal and Child Health Research Institute (MCHRI) accelerates Stanford discoveries to improve the health of pregnant women and children by fostering transdisciplinary research in the pre-clinical, clinical, and basic sciences.

MCHRI's strategic goals are to:

- Focus Stanford's intellectual talent on solving the greatest health challenges facing expectant mothers and children
- Increase the number of future academic leaders dedicated to these problems
- Accelerate innovative research to make transformational discoveries
- Enable the translation of our discoveries into action
- Promote maternal and pediatric health and wellbeing, nationally and globally

OUR COMMUNITY

FY21 MCHRI Membership by Department/Schools

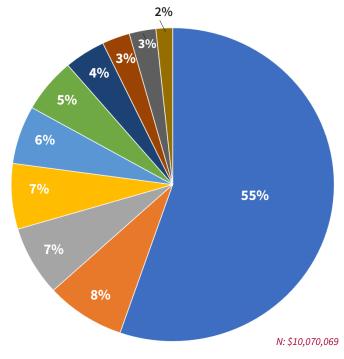


- Pediatrics
- Other Schools/Depts.
- Medicine
- Basic Science Depts.
- School of Engineering
- Radiology
- School of Humanities & Sciences
- Psychiatry & Behavioral Sciences Obstetrics & Gynecology
 - Surgery

 $Other Schools/Depts: Cardiothoracic Surgery; Cardiovas cular Institute; Dermatology; Emergency \, Medicine; Epidemiology, and the property of the Company o$ & Population Health; Graduate School of Education; Health Research & Policy; Institute for Immunity, Transplantation, & In fection; In stitute for Stem Cell Biology & Regenerative Medicine; Neurosurgery; Ophthalmology; Orthopaedic Surgery; Ophthalmology; OphtOtolaryngology; School of Earth, Energy & Environmental Sciences; School of Law; Sociology; Urology

FUNDING OVERVIEW

FY21 Total Funding Awarded by Department



- Pediatrics
- Obstetrics & Gynecology
- Basic Science Depts.
- Anesthesiology, Perioperative & Pain Medicine Other Schools/Depts.
- Medicine

- Psychiatry & Behavioral Sciences
- School of Engineering
- School of Humanities & Sciences
- Neurosurgery

Other Schools/Depts: Orthopaedic Surgery; Pathology; Neurology; School of Earth, Energy, & Environmental Sciences; School of Earth, Environmental Sciences; School oEmergency Medicine; Ophtalmology; Otolaryngology

HIGHLIGHTS OF 2020-2021

Awarded 127 new grants for maternal and child health research across the University, for a total of

\$10,070,069

Provided biostatistical support to 180 projects leading to

27 NIH GRANT SUBMISSIONS

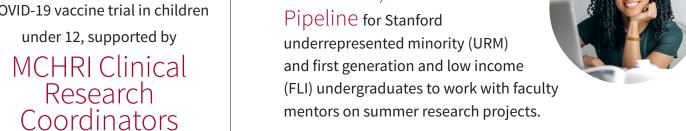
through MCHRI-funded partner, Quantitative Sciences Unit.

 $\begin{array}{c} \text{MCHRI membership} \\ \text{increased by} \\ \textbf{17\% for a total of} \end{array} \begin{array}{c} 939 \\ \text{MEMBERS} \end{array}$



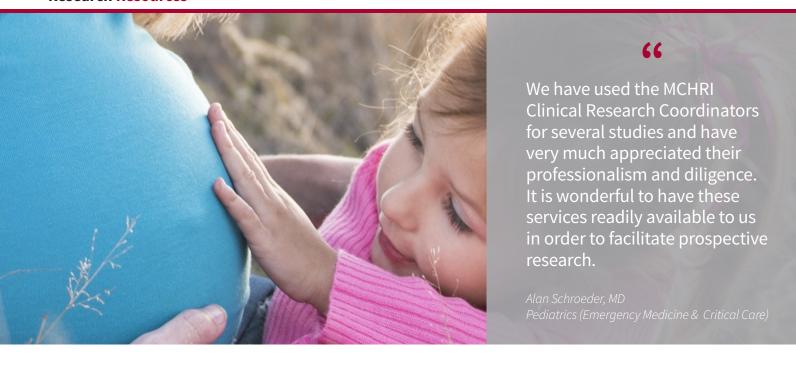
Stanford Medicine served as a test site for Pfizer's nationwide COVID-19 vaccine trial in children MCHRI established two new DE&I initiatives:

- Research on the Structural Racism, Social Injustice and Health Disparities in Maternal and Child Health Pilot Grants
- DRIVE (Diversity, Respect, and Inclusion are Vital for Excellence) in Research Pipeline for Stanford underrepresented minority (URM) and first generation and low income (FLI) undergraduates to work with faculty



The Clinical Research Support Office received 93 new clinical and translational research study Submissions through its new hospital-wide Clinical Research Intake Portal for Stanford Children's Health, representing 32 School of Medicine Departments and Divisions.

MCHRI launched the inaugural Drug & Device Development (D³) Training Program to support Stanford investigators in developing therapeutic and diagnostic devices to benefit mothers and children with 6 industry partners



Clinical Research Coordinator Services

The **Clinical Research Core** consists of experienced maternal and pediatric-focused clinical research coordinators (CRCs) who support a wide variety of research studies and trials.



Studies supported by MCHRI CRCs



24% NIH-funded



13% Industry-funded



63% Other, including PI-Initiated, Foundation, Internal Grant, and Non-Federal

MCHRI jumpstarts two **COVID-19 research studies**

in children supporting our PIs to improve global health initiatives

Pediatric Research Immune Network on SARS-CoV-2 and MIS-C (PRISM)

A study to understand the clinical spectrum of illness and long-term outcomes of children with COVID-19.

Pfizer Pediatric COVID-19 Vaccine Trial, Phase 1 and 2/3

A study to evaluate the SARS-CoV-2 RNA vaccine against COVID-19 in healthy infants and children.

MCHRI expands clinical research coordinator services

Increased flexibility to assist PIs with hiring and onboarding division-dedicated clinical research coordinators. Pls or Divisions can select one of MCHRI's hiring models:

- **Hourly Model:** CRCs support multiple PIs on hourly basis
- Part-time Model: CRCs support single or multiple PIs
- Full-time Model: MCHRI hires new CRC dedicated to PI or Division



Streamlining Clinical Research Operations

The Clinical Research Support Office (CRSO) serves as a central resource for operational, informatics, regulatory, and other support for conducting studies at Stanford Children's Health (SCH).



Enhanced Research Functionality in the Electronic Medical Record (EMR)

- Provided remote access to SCH EMR (Epic) for 150+ sponsor monitors in FY21
- Enabled clinical research staff functionalities in Epic (notes, order entry, billing review, notifications)
- Facilitated subject recruitment to clinical trials through Epic patient portal (MyChart)
- Partnered with Hospital Privacy to develop an adjudication process for research staff access to confidential content in SCH Epic.



Supported Hospital Research Operations

- Implemented Clinical Research Intake Portal for SCH, enabling 93 new studies representing 32 School of Medicine (SoM) Departments/Divisions
- Partnered with SCH Process Improvement and Investigational Drug Services (IDS) teams to develop new tools and improve workflows for IDS study budgeting and initiation



Provided Training & Education for School of Medicine Staff

- Deployed SCH safety, infection prevention, emergency preparedness, and communication training to 140+ clinical research staff
- Developed guidance for study budgeting and research documentation in Epic
- Created 15+ Epic training videos and tip sheets



3rd Annual MCHRI Symposium features the latest science and innovation in maternal and child health research



Virtual Symposium 15 Speakers, 81 Posters

The Education Committee organized the third annual research symposium as an online event, drawing over 800 virtual participants throughout the day and featuring timely topics, from stem cell and gene therapy to school-age learning in COVID-19.



Keynote Speaker David A. Williams, MD

David A. Williams, MD, Senior Vice President and Chief Scientific Officer at Boston Children's Hospital, delivered his keynote address entitled, "Flipping the Switch on Fetal Globin in Sickle Cell Disease: From GWAS to Therapeutics" at the annual symposium.



Visionary Leadership Award Fernando Mendoza, MD, MPH

Fernando Mendoza, MD, MPH, **Emeritus Professor of Pediatrics** and former Associate Dean of Minority Advising and Programs for the Office of Student Affairs, received the 2021 MCHRI Visionary Leadership Award for his lifelong work in minority and immigrant child health and workforce diversity.

MCHRI Drug and Device Development (D3) **Training Program**

Through the support of a generous philanthropic donation, MCHRI launched the inaugural Drug & Device Development (D3) Training Program in 2020 to support Stanford investigators in developing therapeutic and diagnostic devices to benefit mothers and children.

Led by Faculty Director, Gary Shaw, DrPH, and Director of Innovation and Development, Grant Wells, MS, the training program provided individuals with an experience and education in the development of novel therapeutics, medical devices, and diagnostics in an industry environment.



Maternal and Child Health Seminar Series

MCHRI hosted 11 virtual seminars, highlighting more than 30 different speakers and featuring today's most pressing topics in maternal and child health, including:

- Adolescent and Young Adult Health
- Childhood Cancers and Survivorship
- Global Health and Infectious Diseases
- Maternal-Fetal Precision Medicine
- Pediatric Critical Care and Anesthesiology
- Social Policy and Population Health Sciences



Uytengsu-Hamilton 22q11 Neuropsychiatry **Research Networking** Meeting

MCHRI hosted the 22q11 Networking Meeting in March highlight the range of current neuroscience and mental health research in 22q11 deletion

The meeting brought together researchers from a broad range of disciplines across for knowledge exchange and new connections, cultivating opportunities for new collaborations and research



My team and I are fortunate to be among the first round of recipients of MCHRI's new health disparities grants program. This funding has facilitated the development of a new partnership with the Food Equality Initiative—a communitybased organization that has been working to improve health and end hunger in individuals diagnosed with food allergies by providing food as medicine.

R. Sharon Chinthrajah, MD Medicine (Pulmonary, Allergy & Critical Care Medicine) and Pediatrics (Immunology and Allergy)

MCHRI provides pilot grants for research on Structural Racism, Social Injustice and Health **Disparities in Maternal and Child Health**

MCHRI launched the Structural Racism, Social Injustice and Health Disparities in Maternal and Child Health Pilot Awards in 2020 and awarded ten pilot grants for a total of \$350,000.

This funding mechanism encourages researchers to focuses on reasons or drivers of health disparities, and supports action-oriented strategies to promote equity and improve health outcomes in diverse communities through policy or programmatic changes and innovations.

Investigators engage with community partners as part of their research to promote health equity and addressing the impact of structural racism and social injustice in maternal and child health.

See pages 14-15 for a list of 2021 awarded projects.

MCHRI welcomes 10 students to the DRIVE (Diversity, Respect, and Inclusion are Vital for Excellence) in Research Pipeline program

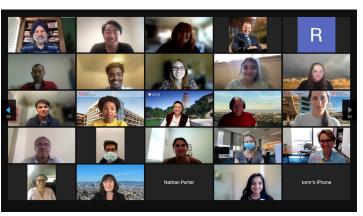
In 2021, MCHRI launched the DRIVE (Diversity, Respect, and Inclusion are Vital for Excellence) Research Pipeline Award, a summer research internship program for underrepresented minorities (URM) and first-generation and/or low income (FLI) Stanford undergraduate students. Ten students were each matched with an established faculty mentor.

Students worked on maternal and child health relevant research projects and attended weekly lectures by mentors who shared their research and career journeys.



Students present their projects and share overall learning experiences at the **Final Student Presentations on August 25**





The students not only left an incredible mark on our faculty, but also our departments and the School of Medicine with the work that they contributed and really driving forward the merits of looking at health disparities. They're the future of what we want to see in research and what's driving us, hence the name of this research program that they are driving for diversity, respect, and inclusion in medical research.

- Carmin Powell, MD,

Pediatrics and Co-Founder of DRIVE in Research Pipeline

The program provides a wonderful opportunity for students from backgrounds underrepresented in medical science to gain valuable research experience at a critical stage in their career. The hope is that such experience will inspire students to pursue any number of pathways for careers in Medicine and Medicine and Science.

- Eric Sibley, MD, PhD

Pediatrics and Co-Founder of DRIVE in Research Pipeline

See page 17 for a list of 2021 DRIVE students and projects.

Grants & Programs

Investing in People & Innovation

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MCHRI support is integral for our research aiming at developing new therapeutic strategies for patients with Gaucher disease. We strongly believe that our research will provide the proof of concept of a one-time therapy even for the most severe Gaucher disease forms affecting young children. Moreover, this scholarship will allow me to generate additional discoveries that will further the field and our understanding of Gaucher disease therapies.

Marc Francois Philippe Gastou, MS, PhD Pediatrics (Medical Genetics)



Faculty Scholars \$100K/year for three to five years

Program Co-Chairs

- Harvey Cohen, MD Professor, Pediatrics
- David K. Stevenson, MD Professor, Pediatrics

Danton Char, MD, MAS, Laurie Kraus Lacob Faculty Scholar in Pediatric Translational Medicine

Associate Professor, Anesthesiology, Perioperative & Pain Medicine; Study Title: Integration of Pediatric Palliative Care and Cardiac Ventricular Assist Device Care for Children

Sushma Reddy, MD, Anne T. and Robert M. Bass Faculty Scholar Assistant Professor, Pediatrics (Cardiology); Study Title: A Noninvasive Signature of Myocardial Signaling in Children with Single Ventricle Heart Failure

Bo Yu, MD, MS, Yamazaki and Jerry Yang Faculty Scholar in Pediatric Translational Medicine Assistant Professor, Obstetrics & Gynecology (Reproductive Endocrinology & Infertility); Study Title: Non-Invasive Preconceptual Chromosomal Diagnosis in Living Sperm

Transdisciplinary Initiatives Program \$100K/year for two years

Study Title: In Vivo Evaluation of Short Bowel Function **Using Soft Bioelectronic Sensors**

PI: James Dunn, MD, PhD, School of Medicine (Surgery) Co-PI: Zhenan Bao, PhD, School of Engineering (Chemical Engineering)

Study Title: AI to Monitor Maternal and Child Health Globally in Near Real Time and At an Extremely High Spatial Resolution: A Proof-Of-Concept Study

PI: Pascal Geldsetzer, MD, PhD, MPH, School of Medicine (Medicine); Co-PIs: Marshall Burke, PhD, School of Earth, Energy & Environmental Sciences (Earth System Science); Gary Darmstadt, MD, MS, School of Medicine (Pediatrics); David Lobell, PhD, School of Earth, Energy & Environmental Sciences (Earth System Science); Stefano Ermon, PhD, School of Engineering (Computer Science)

Study Title: Data-Driven Approach to Personalized Type 1 Diabetes for Underserved Populations Facilitated by Continuous Glucose Monitor Data and Telehealth: Scaling **Beyond Lucile Packard Children's Hospital**

PI: Ramesh Johari, PhD, School of Engineering (Management Science & Engineering); Co-PIs: David Maahs, MD, PhD, School of Medicine (Pediatrics); Priya Prahalad, MD, School of Medicine (Pediatrics); David Scheinker, PhD, School of Medicine (Pediatrics)

Study Title: FocusLab

PI: Anthony Norcia, PhD, School of Humanities and Sciences (Psychology); Co-PIs: Tawna Roberts, OD, PhD, School of Medicine (Ophthalmology); Euna Koo, MD, School of Medicine (Ophthalmology); Scott R. Lambert, School of Medicine (Ophthalmology); Ann Shue, MD, School of Medicine (Ophthalmology); Consultant: Christina Hecht, PhD; Ken Hecht, LLB

Study Title: Examining Communication and Marketing Strategies to Reduce Food Insecurity among Latinx Children in California's San Joaquin Valley

PI: Anisha Patel, MD, MSPH, MSHS, School of Medicine (Pediatrics); Co-PI: Szu-Chi Huang, MA, PhD, Graduate School of Business (Marketing)

Study Title: Using Maternal Metabolomic Profiles to **Determine Gestational Age and Risk of Preterm Birth and Preeclampsia in Low Resource Settings**

PI: Victoria Ward, MD, School of Medicine (Pediatrics) Co-PIs: David K. Stevenson, MD, School of Medicine (Pediatrics); Andrea Montanari, PhD, School of Engineering (Electrical Engineering and Statistics); Mohsen Bayati, PhD, MSc, Graduate School of Business (Operations, Information & Technology); Gary L. Darmstadt, MD, MS, School of Medicine (Pediatrics); Karl G. Sylvester, MD, School of Medicine (Surgery)

Clinical (MD) Trainee

Up to 100% salary/benefits support for up to two years

Program Co-Chairs

- Daniel Bernstein, MD Professor, Pediatrics
- Gerald Grant, MD, FACS Professor, Neurosurgery

Haejun Ahn, MD

Ernest and Amelia Gallo Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Nephrology) Study Title: Application of a Novel Acute Kidney Injury Severity Score in Neonates with Hypoxic Ischemic Encephalopathy

Anne Berens, MD

Ernest and Amelia Gallo Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Developmental-Behavioral Pediatrics) Study Title: Early Life Stress as a Risk Factor for Attention Deficit Hyperactivity Disorder in Adolescence: Mechanistic Pathways and Clinical Implications

Bhavika Chepuri, MD

The Stephen Bechtel Endowed Fellow in Pediatric Translational Medicine Fellow

Clinical Fellow Pediatrics (Pediatric Gastroenterology) Study Title: The ENGaGe Curriculum: Evidence Based Non-Pharmacologic Gastroenterology Curriculum

John Feister, MD

Stanford Maternal & Child Health Research Institute Fellow Clinical Fellow, Pediatrics (Neonatal & Developmental Medicine) Study Title: The Impact of Paid Family Leave on Health Outcomes of Very Low Birthweight Infants in California

Neha Joshi, MD

Ernest and Amelia Gallo Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Hospital Medicine) Study Title: Towards Identifying Optimal NICU Admission Criteria for Late Preterm Infant

Lauren Kushner, MD

Tashia and John Morgridge Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Infectious Diseases) Study Title: Application of the FUNGAL CELL-FREE DNA (cfDNA) Polymerase Chain Reaction (PCR) Assay to Invasive Fungal Disease Evaluation in the Neutropenic Pediatric Oncology and Stem Cell Transplant Population

Lori Lee, PhD, MD

Tashia and John Morgridge Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Pulmonary Medicine) Study Title: Role of CFTR Mutations in Adaptive Immunity

Talia Lester, MD

Ernest and Amelia Gallo Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Developmental-Behavioral Pediatrics) Study Title: Primary Care Provider Use of Evidence-based Treatments for Anxiety and Depression

Sara Patrizi, DO

Ernest and Amelia Gallo Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Pediatric Rheumatology) Study Title: The Effects of Extra-Renal Manifestations at Diagnosis on Renal Response in a Pediatric Systemic Lupus Erythematosus Cohort

Valerie Peicher, MD

Tashia and John Morgridge Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (General Pediatrics) Study Title: Si Se Puede: Medicaid for All and Measurable Health Outcomes

Maria Peinado-Fabregat, MD, MS

Ernest and Amelia Gallo Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (General Pediatrics) Study Title: Prevalence and Nutritional Risk Factors Associated with Obesity Among Children with Medical Complexity

Rameshwar Rao, MD, PhD

Anne T. and Robert M. Bass Endowed Fellow Clinical Fellow, Pediatrics (Hematology/Oncology) Study Title: Bioengineering Osteosarcoma



The MCHRI postdoctoral support allows me to investigate possible mechanisms that underpin symptoms in Avoidant/Restrictive Food Intake Disorder (ARFID), a type of eating disorder which onsets in childhood and can lead to psychosocial impairment and severe medical sequelae. This grant enables me to collect important pilot data characterizing interoceptive processes, a potential biological marker for dysregulated eating behavior.

> Nandini Datta, PhD Psychiatry & Behavioral Sciences

Cathy Tsin, MD

Tashia and John Morgridge Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Allergy, Immunology & Rheumatology) Study Title: Thrombotic Microangiopathic Changes in Kidney Biopsies of Childhood-Onset Systemic Lupus Erythematous Patients with Severe Hematologic Disturbances: A Single Center Retrospective Case Control Study

Luisa Valenzuela Riveros, MD

Tashia and John Morgridge Endowed Postdoctoral Fellow Clinical Fellow, Pediatrics (Pediatric Endocrinology) Study Title: Trabecular Bone Score in a Healthy Pediatric Population

Crystal Wang, MD

Paul and Yuanbi Ramsay Endowed Fellow Clinical Fellow, Pediatrics (Hematology/Oncology) Study Title: Characterizing the Relationship Between Cellular Adhesion and Quiescence in Central Nervous System Involvement of B-cell ALL

Lauren Wozniak, MD, MPH

Mary Gallo Endowed Postdoctoral Fellow in Adolescent Medicine Clinical Fellow, Pediatrics (Adolescent Medicine) Study Title: Disparities in Hospitalizations for Medical Stabilization of Adolescent and Young Adult Patients with Eating Disorders in California

Xixi Zhao, MD

Rosa A. Wann and Marjorie Shannon Fellow Clinical Fellow, Pediatrics (Nephrology) Study Title: Using Machine Learning to Predict Intradialytic Hypotension in Children with Kidney Failure Requiring Hemodialysis

Postdoctoral Support

Up to \$80K/year for up to two years

Requires a commitment from the mentor of \$40K for year 2

Program Panel Chairs

- Jeffrey A. Feinstein, MD, MPH Professor, Pediatrics
- Julien Sage, PhD Professor, Pediatrics
- Kathleen Sakamoto, MD, PhD Professor, Pediatrics
- Virginia Winn, MD, PhD Associate Professor, Obstetrics & Gynecology

Dulguun Amgalan, PhD

Postdoctoral Fellow, Genetics

Study Title: Regulatory Maps of Endothelial Cell Differentiation to Connect Congenital Heart Disease Risk Variants to Target Genes

Nandini Datta, PhD

Postdoctoral Fellow, Psychiatry & Behavioral Sciences Study Title: Exploration of Interoceptive Capabilities in Avoidant/ Restrictive Food Intake Disorder

Dorien Feyaerts, PhD

Postdoctoral Research Fellow, Anesthesiology, Perioperative & Pain Medicine

Study Title: Cross-Tissue Assessment of Local and Peripheral Immune Determinants of Preeclampsia

Connie Fung, PhD

Postdoctoral Fellow, Pathology Study Title: The Role of Intestinal Taste Cells in Regulating Parasite Expulsion from the Gut

Marc Francois Philippe Gastou, MS, PhD

Postdoctoral Fellow, Pediatrics (Medical Genetics) Study Title: Combining Genetic Substrate Reduction with Targeted-Glucocerebrosidase Addition in Human Hematopoietic Stem Cells: A Universal Strategy for Genetic Correction Gaucher Disease

Dongyun Jiang, PhD

Postdoctoral Fellow, Neurobiology Study Title: Investigating Activity-Dependent Protein Synthesis in Fragile X Mice Using a Novel Chemogenetic Approach

Nicole Krentz, PhD

Postdoctoral Research Fellow, Pediatrics (Endocrinology) Study Title: The Role of Ras Responsive Element Binding Protein 1 (RREB1) in Adipocyte Development and Function

Jiannan Li, PhD

Postdoctoral Research Fellow, Orthopaedic Surgery Study Title: Integration of Stem Cell Therapy with a Bioactive Hybrid Scaffold Adaptable to Fetal Growth for Improved Prenatal Treatment of Spina Bifida

Li Li, PhD, MS

Postdoctoral Fellow, Pediatrics (Neonatal & Developmental Medicine)

Study Title: Deciphering Hypoxic White Matter Injury of Prematurity Using Human Stem Cell-derived Oligodendrocytes

Rihui Li, PhD

Postdoctoral Research Fellow, Psychiatry (Interdisciplinary Brain Sciences Research)

Study Title: Uncovering Neurobiological Signatures of Social Interaction Dysfunction in Children with Fragile X Syndrome

Mahalakshmi Ramamurthy, MD

Postdoctoral Fellow, Pediatrics (Developmental Behavioral) Study Title: Investigating the Causal Role of Attention in Dyslexia

Maria Caterina Rotiroti, PhD

Postdoctoral Research Fellow, Pediatrics (Hematology/Oncology) Study Title: Potentiating CAR T Cell Efficacy Through Enhancement of Proximal T-Cell Signaling

Bhagyesh Sarode, PhD

Postdoctoral Research Fellow, Chemical & Systems Biology Study Title: A Transposon-Based Approach for Optogenetic Engineering

Xiaoran Sun, PhD

Postdoctoral Fellow, Pediatrics (General Pediatrics) Study Title: Examining Implications of Parent-Adolescent Digital Communication for their Relationship Quality and Adolescent Mental Health



Pilot Grant Progams \$35K for one year

Program Co-Chairs

- Paul C. Grimm, MD Professor, Pediatrics
- Gary M. Shaw, DrPH Professor, Pediatrics

New Idea Grants

Jason Andrews, MD, SM

Associate Professor, Medicine (Infectious Diseases) Study Title: Development of a novel point-of-care molecular assay for G6PD deficiency

Rosa Bacchetta, MD

Associate Professor, Pediatrics (Stem Cell Transplantation) Study Title: Revealing the Origin of Autoreactive T cells in IPEX **Patients**

Carol Conrad, MD

Associate Professor, Pediatrics (Pulmonary Medicine) Study Title: Discovery of Biomarker Signature for Graft Failure in Pediatric Lung Transplantation

Calvin Kuo, MD, PhD

Professor, Medicine (Hematology) Study Title: Soil and Seed: An Endometrial Organoid Model of **Human Implantation**

Kevin Shea, MD

Professor, Orthopaedic Surgery Study Title: Development of Pediatric Meniscus Tissue - Agerelated Changes in MR Quantitative Parameters, Mechanical Properties, and Biochemical Composition

Xinnan Wang, MD, PhD

Associate Professor, Neurosurgery Study Title: Targeting a Novel Mitochondrial Redox Pathway for Friedreich's Ataxia

Early Career Grants

Bereketeab Haileselassie, MD, MHS

Assistant Professor, Pediatrics (Critical Care) Study Title: Understanding the Role of Altered Mitochondrial Dynamics and Extracellular Mitochondrial Content in GVHD Pathogenesis

Ioannis Karakikes, PhD

Assistant Professor, Cardiothoracic Surgery Study Title: Identification and Functional Validation of Pathogenic Noncoding Loci in Congenital Heart Disease

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I am extremely grateful to the MCHRI for the Pilot Grant support that has allowed us to pursue a new direction in my lab in reproductive health. Thanks to this funding, we have been able to develop a new organoid culture model of the uterine lining or endometrium to pursue our goal of better understanding maternal-embryo interactions during implantation.

> Calvin Kuo, MD, PhD Medicine (Hematology)

Anca Pasca, MD

Assistant Professor, Pediatrics (Neonatal & Developmental

Study Title: Understanding the Biology Underlying Neurodevelopmental Disorders in Trisomy 18

Laura Prolo, MD, PhD

Assistant Professor, Neurosurgery Study Title: Integrated Characterization of the Genomic and

Methylomic Landscape of Pediatric High-Grade Gliomas to Identify Determinants of Treatment Response and Outcome

Structural Racism, Social Injustice and **Health Disparities Pilot Grants** \$35K for one year

Program Co-Chairs

- Lisa Chamberlain, MD, MPH Professor, Pediatrics
- Anisha Patel, MD, MSPH, MSHS Associate Professor, Pediatrics

Ananta Addala, DO, MPH

Instructor, Pediatrics (Endocrinology & Diabetes) Study Title: Reducing Disparities in Pediatric Diabetes: Building the Evidence Base to Inform Effective Diabetes Technology Interventions in Underrepresented Minorities

Kanwaljeet S. Anand, MBBS, D.Phil.

Professor, Anesthesiology, Perioperative & Pain Medicine and Pediatrics (Critical Care)

Study Title: A Biopsychosocial Program to Ameliorate the Effects of Perceived Stress and Discrimination on Health Outcomes in Socially Disadvantaged Children

Natali Aziz, MD, MS

Clinical Associate Professor, Obstetrics & Gynecology (Maternal-Fetal Medicine)

Study Title: COVID-19 Household Transmission and Social Determinants of Health in Pregnancy

Erica Pasciullo Cahill, MD, MS

Clinical Assistant Professor, Obstetrics & Gynecology (Gynecology & Family Planning)

Study Title: Patient Evaluation of an Anti-Racism Perinatal Tool

R. Sharon Chinthrajah, MD

Clinical Associate Professor, Medicine (Pulmonary, Allergy & Critical Care Medicine) and Pediatrics (Allergy & Clinical Immunology)

Study Title: Improving Racial Diversity in our Food Allergy **Programs**

Michael C. Frank, PhD

Associate Professor, Psychology Study Title: Measuring Children's Early Vocabulary Using Large Scale Data from Diverse Families

Bonnie Halpern-Felsher, PhD

Professor, Pediatrics (Adolescent Medicine) Study Title: Youth Perceptions of the Racialization of Cannabis: Implications for Prevention and Policies

Stephanie Leonard, MS, PhD

Instructor, Obstetrics & Gynecology (Maternal Fetal Medicine) Study Title: Identifying Opportunities to Improve Health Inequities for Pregnant People using National Claims Data

Priya Prahalad, MD, PhD

Clinical Assistant Professor, Pediatrics (Endocrinology & Diabetes) Study Title: Telehealth Delivery to Change the Paradigm of Care Delivery in Children with Type 1 Diabetes

Sejal Shah, MD

Clinical Assistant Professor, Pediatrics (Endocrinology & Diabetes) Study Title: Use of Continuous Glucose Monitors in Publicly-Insured Youth with Type 2 Diabetes - A Pilot and Feasibility Study



Clinician Educator \$35K for one year

Program Co-Chairs

- Bertil Glader, MD, PhD Professor, Pediatrics
- Deirdre J. Lyell, MD Professor, Obstetrics & Gynecology

Catherine Aftandilian, MD, MS

Clinical Associate Professor, Pediatrics (Hematology/Oncology) Study Title: Using Microbial Cell-Free DNA to Differentiate Infection from Inflammation in Pediatric Patients with B ALL Receiving CAR T Cell Therapy

Anna Arroyo, MD, MPH

Clinical Assistant Professor, Medicine (Pulmonary, Allergy & Critical Care Medicine)

Study Title: Maternal Preeclampsia and the Risk of Childhood Asthma

William Collins, MD

Clinical Assistant Professor, Medicine Study Title: The Utilization of Virtual Reality Headset Games to Mitigate the Emotional Burden of Food Allergy Research Participation for Pediatric Patients and their Caregivers

Sara Kreimer, MD

Clinical Assistant Professor, Pediatrics (Hematology/Oncology) Study Title: CIC-Rearranged Sarcoma: A Multi-Institutional, Retrospective, Observational Study Describing the Clinicopathologic Features, Treatments, and Outcomes of Patients < 30 Years with CIC-Rearranged Sarcomas

Sarah Lee, MD

Clinical Assistant Professor, Neurology & Neurological Sciences Study Title: Neuroimaging Biomarkers of Favorable Outcome after Thrombectomy in Acute Pediatric Arterial Ischemic Stroke

Zoel Quinonez, MD

Clinical Assistant Professor, Anesthesiology, Perioperative & Pain Medicine

Study Title: Validation of Diagnosis and Procedure Codes Available in Administrative Claims Data for Outcomes Assessment of Patients Undergoing Pulmonary Valve Repair or Replacement Surgery at Lucile Packard Children's Hospital

Lauren Schneider, PsyD

Clinical Associate Professor, Psychiatry & Behavioral Sciences (Child and Adolescent Psychiatry) and Pediatrics (Cardiology) Study Title: Validation of the Stanford Pediatric Pretransplant Optimization Tool for Transplant (SPPOTT)

Elizabeth Shepard, MD

Clinical Associate Professor, Pediatrics (General Pediatrics) Study Title: Gardner GOALS



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The MCHRI Clinician Educator support has provided me with focused time and statistical resources to continue investigating maternal risk factors for childhood asthma. Additionally, this funding has been critical in helping me establish collaborations foundational to my work during my early research career.

> Anna Arroyo, MD, MPH Medicine (Pulmonary, Allergy & Critical Care Medicine)

Bridge Support

Up to \$100K/year for up to one year

50% support from both MCHRI & awardee's department

Jochen Profit, MD, MPH

Associate Professor, Pediatrics (Neonatal & Developmental Medicine)

Study Title: Optimizing Perinatal Care Regionalization

Suzanne Tharin, MD, PhD

Assistant Professor, Neurosurgery Study Title: An Evolutionarily Acquired MicroRNA Cluster Shapes Development of Mammalian Cortical Projections

Instructor K Award Support

Up to \$50K/year for up to two years 50% support from both MCHRI & awardee's department

John Hegarty, PhD

Instructor, Psychiatry & Behavioral Sciences (Child & Adolescent Psychiatry)

Study Title: Targeting the Neurology of Restricted and Repetitive Behaviors on Children with Autism Using N-Acetycysteine

Marie Hollenhorst, MD, PhD

Clinical Instructor, Pathology and Medicine (Hematology) Study Title: Biochemisty of Platelet Desialylation

Jennifer Ikle, MD, PhD

Instructor, Pediatrics (Endocrinology & Diabetes) Study Title: Training Research Leaders in Type 1 Diabetes

Gayathree (Gaya) Murugappan, MD

Instructor, Obstetrics & Gynecology (Reproductive Endocrinology & Infertility)

Study Title: Stanford Women's Reproductive Health Research Career Development Program

Danielle Panelli, MD

Instructor, Obstetrics & Gynecology (Maternal Fetal Medicine) Study Title: Stanford Women's Reproductive Health Research Career Development Program

Molly Tanenbaum, PhD

Instructor, Pediatrics (Endocrinology & Diabetes) and Medicine (Endocrinology, Gerontology, & Metabolism) Study Title: ONBOARD: Overcoming Barriers & Obstacles to Adopting Diabetes Devices

Daniel Tawfik, MD

Instructor, Pediatrics (Critical Care) Study Title: Development and Validation of a Prediction Model to Address Physician Burnout

Sriram Vaidyanathan, PhD

Instructor, Pediatrics (Stem Cell Transplantation) Study Title: A Universal Genome Editing Strategy to Develop an Airway Stem Cell Therapy for Cystic

Jessie Wong, PhD

Instructor, Pediatrics (Endocrinology & Diabetes) Study Title: Family Matters: Optimizing Family –Based Interventions for Adolescents with Type 1 Diabetes

Mollie Woodworth, PhD

Instructor, Ophthalmology Study Title: Development and Regeneration of Retinal Ganglion Cells in the Vertebrate Retina

Master's Tuition Support

Up to \$32,500/year for up to two years

Heather Alva, MD

Postdoctoral Medical Fellow, Pediatrics (Hematology/Oncology) Master's Student in Epidemiology and Clinical Research

Jessica R. Ansari, MD

Clinical Assistant Professor, Anesthesiology, Perioperative & Pain

Master's Student in Epidemiology and Clinical Research

Maria Peinado Fabregat, MD, MS

Fellow, Pediatrics (General Pediatrics) Master's Student in Epidemiology and Clinical Research

John Feister, MD

Fellow, Pediatrics (Neonatal & Developmental Medicine) Master's Student in Health Policy

Christina Johnson, MD

Fellow, Obstetrics & Gynecology (Maternal Fetal Medicine) Master's Student in Epidemiology and Clinical Research

Danielle Panelli, MD

Instructor, Obstetrics & Gynecology (Maternal-Fetal Medicine) Master's Student in Epidemiology and Clinical Research

Valerie Peicher, MD

Postdoctoral Medical Fellow, Pediatrics (General Pediatrics) Master's Student in Health Policy

Zachary Smith, MD

Fellow, Pediatrics (Critical Care) Master's Student in Epidemiology (London School of Hygiene and Tropical Medicine)



DRIVE (Diversity, Respect, and Inclusion are Vital for Excellence) in Research **Pipeline Awards**

Student stipend of \$5,000

Crystal Chidume, Undergraduate Student in Symbolic Systems Faculty Mentor: Dr. Anisha Patel, Pediatrics (General Pediatrics) Project: Water First Intervention

Juan Espinal-Mejia, Undergraduate Student in Human Biology Faculty Mentor: Dr. Heike Daldrup-Link, Radiology (Pediatric

Project: Cancer Imaging Techniques Mini-Fellowship for the **Underserved Students**

Camryn Franke, Undergraduate Student in Bioengineering Faculty Mentor: Dr. Tanja Gruber, Pediatrics (Hematology/ Oncology)

Project: Delineating the Role and Immunogenicity of CBFA2T3-GLIS2 in Pediatric Acute Megakaryoblastic Leukemia

Rojie Hajjar, Undergraduate Student in Human Biology Faculty Mentor: Dr. William Collins, Medicine Project: Remote Monitoring of Respiratory Health

Olivia Mendoza, Undergraduate Student in Human Biology Faculty Mentor: Dr. Stephanie Chao, Surgery (Pediatric Surgery) Project: Screening for PTSD Among Children After Traumatic Injury

Ahmed Moutwakil, Undergraduate Student in Human Biology Faculty Mentor: Dr. Rishi Mediratta, Pediatrics Project: Newborn Health in Humanitarian Settings

Devin Moua, Undergraduate Student in Human Biology Faculty Mentor: Dr. Kanwaljeet S. Anand, Pediatrics (Critical Care) Project: Biomarkers for Risk and Resilience in Children of Socially Disadvantaged or Minority Families

Monica Pena-Aguilar, Undergraduate Student in Psychology; Faculty Mentor: Dr. Lee Sanders, Pediatrics (General Pediatrics) Project: Immigrant Families and Childrens Health: The Intergenerational Health Impact of Federal and State Immigration Policy

Elisa Rivas, Undergraduate Student in Psychology Faculty Mentor: Dr. Henry Lee, Pediatrics (Neonatal & Developmental Medicine)

Project: Family Engagement in the NICU for Preterm Babies

Sangam Sharma, Undergraduate Student in Human Biology Faculty Mentor: Dr. Thomas Robinson, Pediatrics (General Pediatrics) and Medicine (Stanford Prevention Research Center) Project: Wise Social Psychological Interventions to Improve Outcomes of Behavioral Weight Control in Children with Obesity

Uytengsu-Hamilton 22q11 Neuropsychiatry Research Awards \$150K/year for two years

Stanford Awards

Mark Kay, MD, PhD

Professor, Pediatrics (Human Gene Therapy) and Genetics, Stanford School of Medicine

Study Title: Developing Novel Adeno-associated Virus Vectors for Gene Therapy of 22q11.2 Deletion Syndrome

Michael Lin, MD PhD

Associate Professor, Neurobiology and Bioengineering, Stanford University

Study Title: Visualizing and Reversing Electrical Abnormalities in a Mouse Model of 22q11.2 Deletion Syndrome

Anca Pasca, MD

Assistant Professor, Pediatrics (Neonatology), Stanford School of Medicine

Study Title: Identification of Metabolic Disturbances in the Developing Brain of Individuals with 22q11.2 Deletion Syndrome

Lei Stanley Qi, PhD

Assistant Professor, Bioengineering and Chemical and Systems Biology, Stanford University

Study Title: Systematic Identification and Correction of Genes Defining the Neuropsychiatric Phenotype in 22g11 Deletion Syndrome Using the CRISPR Toolbox

External Awards

Therese van Amelsvoort, MD, PhD

Professor, Psychiatry and Neuropsychology, Maastricht University Study Title: The Glutamate/GABA Balance as Novel Therapeutic Target for Psychotic and Cognitive Symptoms In 22q11.2 Deletion Syndrome

Stanislav Zakharenko, MD, PhD

Professor, Developmental Neurobiology, St Jude Children's Research Hospital

Study Title: Focal Cerebellar Abnormality in Patients and Mouse Models Of 22q11 Deletion Syndrome

Stanford Pediatric IBD and Celiac Disease Research Awards - Seed Grant

\$100K/year for two years

Rosa Bacchetta, MD

Associate Professor, Pediatrics (Stem Cell Transplantation) Study Title: Engineered Regulatory T Cells as an Autologous Immune Modulator for Pediatric Inflammatory Bowel Disease

Dylan Dodd, MD, PhD

Assistant Professor, Pathology and Microbiology & Immunology Study Title: Microbiome Metabolites as Predictive Markers of Outcomes in Pediatric Crohn's Disease

Christopher Garcia, PhD

Professor, Molecular & Cellular Physiology and Structural Biology Study Title: Therapeutic Development of Engineered IL-22 Agonists in IBD

Jeong S. Hyun, MD

Assistant Professor, Surgery (Pediatric Surgery) Study Title: Characterization of Fibrosis in Crohn's Disease through Mesenteric Adipose Tissue

Calvin Kuo, MD, PhD

Professor, Medicine (Hematology)

Study Title: Organoid Modeling of Immune-epithelial Interactions in Pediatric Celiac Disease

Elizabeth Mellins, MD

Professor, Pediatrics (Human Gene Therapy) Study Title: Optimizing TCR-like Reagents for Study of Gliadin Presentation

Stanford Pediatric IBD and Celiac Disease Research Awards - Postdoctoral Support \$80K/year for two years

Elias Gerrick, PhD

Postdoctoral Research Fellow, Pathology Study Title: Investigation of Divergent Modulation of IBD by Symbiotic Protists of the Microbiota

Qinghui Mu, PhD

Postdoctoral Research Fellow, Hematology Study Title: Organoid Modeling of Immune-epithelial Interaction in Pediatric Inflammatory Bowel Disease

FUNDED PARTNERS AWARDS

Global Child Health Program Awarded a total amount of \$50,000

Peter Acker, MD, MPH

Clinical Associate Professor, Emergency Medicine Study Title: Development and Testing of a Prehospital Maternal Emergency Obstetric Warning Score (MEOWS) in India

Marshall Burke, PhD

Associate Professor, Earth System Science Study Title: Direct Empirical Estimates of the Health Burden of Air Pollution in Developing Countries

SPARK

Awarded a total amount of \$250,000

Eric Appel, PhD

Assistant Professor, Materials Science & Engineering Study Title: An Ultra-Fast Insulin to Improve the Treatment of Diabetes

Maria Barna, PhD

Associate Professor, Genetics Assistant Professor, Materials Science & Engineering Study Title: Identifying Translational Activators for the Treatment of Diamond Blackfan Anemia

Vivek Bhalla, MhD

Associate Professor, Medicine (Nephrology) Study Title: Gene Therapy for Autosomal Dominant Polycystic Kidney Disease

Ami Bhatt, MD, PhD

Assistant Professor, Medicine (Hematology) Study Title: Developing Novel Microbial Integrases as Next-Generation Gene Therapies

Kelly Mahaney, MD, MS

Assistant Professor, Neurosurgery Study Title: Development of Iron Chelation Intraventricular Drug Delivery for Prevention of Post-Hemorrhagic Hydrocephalus (PHH) in Severe Neonatal Intraventricular Hemorrhage (IVH)

Stanford Byers Center for Biodesign Faculty Fellowship

Awarded a total amount of \$13,500

Sabrina Braham, MD

Clinical Assistant Professor, Pediatrics (General Pediatrics)

Kara Davis Meister, MD

Clinical Assistant Professor, Otolaryngology (Head & Neck Surgery Divisions)

Rayhan Lal, MD

Assistant Professor, Pediatrics (Endocrinology and Diabetes) and Medicine (Endocrinology, Gerontology, & Metabolism)

Stanford Cardiovascular Institute

Awarded a total amount of \$20,000

Ronglih Liao, PhD

Professor, Medicine (Cardiovascular Medicine) Study Title: The Heart of the Matter: Functional Impact of Prenatal Nicotine Exposure

Mark Skylar-Scott, PhD

Assistant Professor, Bioengineering Study Title: Development of Optogenetic Thrombin for Lightdirected Hemostasis During Unifocalization Surgery

Stanford Diabetes Research Center Awarded a total amount of \$40,000

Danny Chou, PhD

Assistant Professor, Pediatrics (Endocrinology & Diabetes) Study Title: Next Generation Insulin Therapeutics Enabled by Computational Protein Design

Monique Barakat, MD

Assistant Professor, Pediatrics (Gastroenterology) and Medicine (Gastroenterology & Hepatology)

Study Title: Morphological and Molecular/Cellular Profiling of Pancreatic Primary Cilia Across the Human Lifespan and in Pancreatitis

Yair Blumenfeld, MD

Associate Professor, Obstetrics & Gynecology (Maternal Fetal Medicine)

Study Title: Fasting Versus Fed: Effect of Oral Intake Prior to the Glucose Tolerance Test in Pregnancy

Undiagnosed Diseases Network Awarded a total amount of \$49,000

Natalia Gomez-Ospina, MD, PhD

Assistant Professor, Pediatrics (Medical Genetics and Stem Cell Transplantation)

Study Title: Generating a Human Cell Tool Kit for Organelle-Specific OMICs Studies

LEADERSHIP

MCHRI Governing Board

Cynthia J. Brandt, PhD

President and CEO, Lucile Packard Foundation for Children's Health

Jeff Chambers, MBA

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President and CEO, Lucile Packard Children's Hospital Stanford

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David K. Stevenson, MD

Co-Director, MCHRI; Senior Associate Dean for Maternal & Child Health and Professor of Pediatrics (Neonatal & Developmental Medicine), Stanford School of Medicine

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Anthony Oro, MD, PhD

Co-Director, MCHRI

David K. Stevenson, MD

Co-Director, MCHRI

Karl Sylvester, MD

Director of Clinical Research Support Office, MCHRI; Associate Dean for Maternal & Child Health Research and Professor of Surgery (Pediatric Surgery), Stanford School of Medicine

Mary M. Chen, MS, MBA

Executive Director, MCHRI; Assistant Dean for Maternal & Child Health Research, Stanford School of Medicine

Members

David Cornfield, MD

Professor of Pediatrics (Pulmonary Medicine), Stanford School of Medicine

James Dunn, MD, PhD

Surgeon-in-Chief, Lucile Packard Children's Hospital Stanford; Professor of Surgery (Pediatric Surgery); Stanford School of Medicine

Michelle Monje-Deisseroth, MD, PhD

Associate Professor of Neurology & Neurological Sciences; Stanford School of Medicine

Thomas Robinson, MD, MPH

Professor of Pediatrics (General Pediatrics) and of Medicine (Stanford Prevention Research Center); Stanford School of Medicine

Kathleen Sakamoto, MD, PhD

Professor of Pediatrics (Hematology & Oncology); Stanford School of Medicine

Virginia Winn, MD, PhD

Associate Professor of Obstetrics & Gynecology (Reproductive Biology); Stanford School of Medicine

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Anthony Oro, MD, PhD - Chair

Co-Director, MCHRI

Elizabeth Burgener, MD

Instructor in Pediatrics (Pulmonary Medicine)

Natalia Gomez-Ospina, MD, PhD

Assistant Professor of Pediatrics (Medical Genetics)

Kelly Mahaney, MD

Assistant Professor or Neurosurgery

Melissa Mavers, MD, PhD

Instructor in Pediatrics (Stem Cell Transplantation)

Kara Meister, MD

Clinical Assistant Professor, Otolaryngology (Head & Neck Surgery Divisions)

Trung Pham, MD, PhD

Instructor in Pediatrics (Infectious Diseases)

Thomas Robinson, MD, MPH

Professor of Pediatrics (General Pediatrics) and of Medicine

Ryan Christopher Padrez, MD

Clinical Associate Professor, Pediatrics - General Pediatrics

Sriram Vaidyanathan, PhD

Instructor in Pediatrics (Stem Cell Transplantation)

Virginia Winn, MD, PhD

Associate Professor of Obstetrics & Gynecology (Reproductive Biology)

Clinical Research Support Office Executive Advisory Committee

Kathleen Bradley, DNP, RN, NEA-BC

Associate Chief Nursing Officer (ACNO) Practice & Innovation, Informatics Liaison; Executive Director, Center for Professional Excellence & Inquiry, Stanford Children's Health

Jesus Cepero, PhD, RN, NEA-BC

Senior Vice President Patient Care Services and Chief Nursing Officer, Stanford Children's Health

Mary M. Chen, MS, MBA

Executive Director, MCHRI

Grace Lee, MD

Associate Chief Medical Officer for Practice Innovation, Stanford Children's Health; Professor of Pediatrics, Stanford School of Medicine

Mary Leonard, MD, MSCE

Director, MCHRI

Dennis Lund, MD

Chief Medical Officer and Vice President of Medical Affairs, Stanford Children's Health; Associate Dean for Maternal and Child Health, Stanford School of Medicine

Ed Kopetsky

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Director of Nursing Research and Evidence-Based Practice, Stanford Children's Health; Clinical Associate Professor of Pediatrics, Stanford School of Medicine

Natalie Pageler, MD

Chief Medical Information Officer, Stanford Children's Health; Clinical Professor of Pediatrics and Clinical Associate Professor of Medicine. Stanford School of Medicine

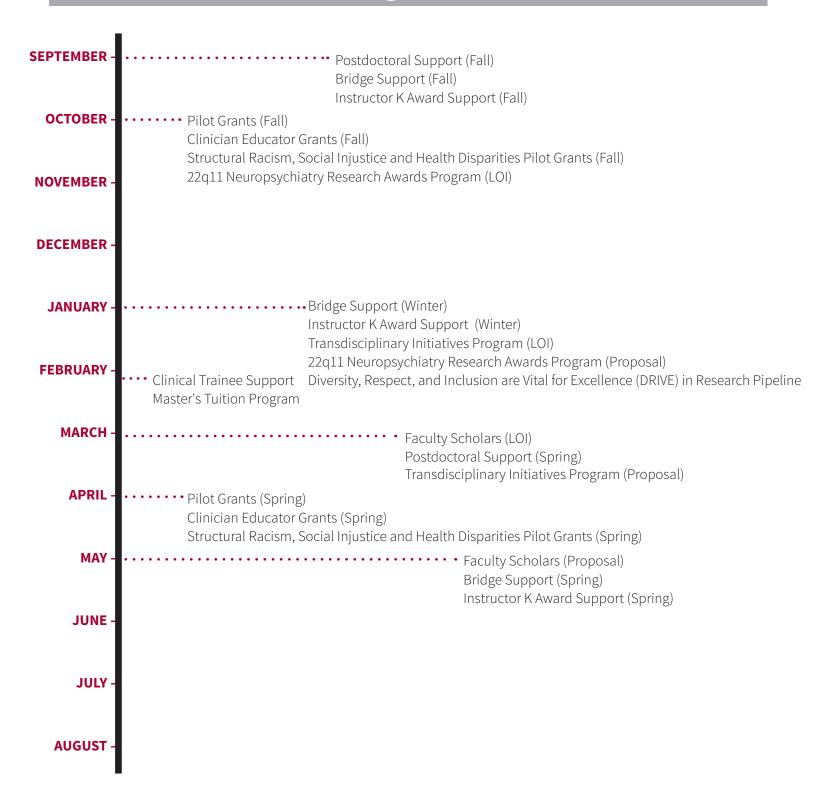
Rishi Seth

Vice President of Operations, Stanford Children's Health

Karl Sylvester, MD

Director of Clinical Research Support Office, MCHRI

Grants & Programs Timeline



For information about funding programs and deadlines, visit our wesbite at mchri.stanford.edu.



Annual Report FY 2021

MCHRI ADMINISTRATION

Mary Chen, MS, MBA Executive Director of MCHRI; Assistant Dean for Maternal and Child Health Research, Stanford School of Medicine

Grant Wells, MS Cristina Alfonso Grisel Arrue Rachael Panizzo, PHD Carol Schulze Kimberly Stern Roxanna Van Norman, MA

MCHRI CLINICAL RESEARCH SUPPORT OFFICE (CRSO)

Karl Sylvester, MD Director of CRSO; Associate Dean for Maternal and Child Health Research, Stanford School of Medicine

Alyson Falwell, MPH Sijo Thomas, RN, MSN, MBA Tricia Ning

MCHRI CLINICAL RESEARCH CORE

May Zepeda, CCRP Clinical Research Manager

Julia Buckingham Yael Bichman Allie DaCar Erica Johnston Andrea Miranda Aisha Nisar Elvi Sanjines Mariam (Ani) Stephen Jessica Whalen

ACKNOWLEDGEMENTS

Thank you to all of our MCHRI donors, members, leadership, staff, awardees, collaborators, and partners for their support.

Special thanks to our strategic partners, the Lucile Packard Children's Hospital Stanford/Stanford Children's Health, Lucile Packard Foundation for Children's Health, Stanford Health Care, and Stanford School of Medicine.

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