



oneVCU

RESEARCH

FY 2022 funded projects by *primary* initiative

Enriching the Human Experience

VCU Quest Fund

Virtualizing Stable Wireless Communication via Intelligent Reflecting Surface: Yanxiao Zhao, Ph.D., College of Engineering

Through Their Eyes: Leveraging Virtual Reality Technology to Understand Adolescents' Perceptions of Custodial Police Interrogations: Hayley Cleary, Ph.D., L. Douglas Wilder School of Government and Public Affairs

The Cultural Proficiency Continuum Dialogic Protocol (CPCDP): Dayne Cormier, Ph.D., School of Education, Rachel Gomez, Ph.D., School of Education; Albert Byers, Ph.D., School of Education; Melissa Cuba, Ph.D., School of Education; Kim McKnight, Ph.D., School of Education

Bimetallic Transition Metal Phosphide Nanostructures as High-Efficiency, Earth Abundant Catalysts for Electrochemical Water Splitting: Indika Arachchige, Ph.D., College of Humanities and Sciences; Ka Un Lao, Ph.D., College of Humanities and Sciences

Testing family dynamics among Eritrean migrants in the Greater Washington DC area: Miriam Kuttikat, Ph.D., School of Social Work

Investigation into the Impact of Promotion and Tenure on Engagement within Open Practices at the School of Education: Jessica Kirschner, MLIS, VCU Libraries; Hillary Miller, M.S., VCU Libraries; Jose Alcaine, Ph.D., School of Education; Sergio Chaparro, Ph.D., VCU Libraries

Si-based hybrid plasmonic/photonic nanotweezers for quantum photonics: Vitaliy Avrutin, Ph.D.; College of Engineering, Ümit Özgür, Ph.D., College of Engineering

VCU Accelerate Fund

Engaging Parents in Afterschool STEM Projects: Yaoying Xu, Ph.D., School of Education; Katherine Dabney, Ph.D., School of Education; Moe Greene, Ph.D., School of Education

Planning Grant to Found VCU Center for Arts and Humanities in Healthcare: Aaron Anderson, Ph.D., School of the Arts; Christiana Lafazani, School of the Arts; Cristina Stanciu, Ph.D., College of Humanities and Sciences

VCU Breakthroughs Fund

Toward Creative Human-Robot Teams: Patrick Martin, Ph.D., College of Engineering; Kate Sicchio, Ph.D., School of the Arts

Launching Excellence in Virtual Reality (LEVR): James Thomas, Ph.D., College of Health Professions; Nathaniel Kinsey, Ph.D., College of Engineering; Semi Ryu, School of the Arts

VCU Commercialization Fund

Grit VR: A virtual reality staff burnout prevention program: Nicholas Thomson, Ph.D., College of Humanities and Sciences

VR Platform for Surgeon Training - Retropubic Midurethral Sling Procedure: Lauren Siff, Ph.D., School of Medicine

Achieving a Just and Equitable Society

VCU Quest Fund

Remote Work, Geographic Mobility, and the Long-Run Economic Impact of COVID-19: Adam Blandin, Ph.D., School of Business

VCU Accelerate Fund

Career Pathways for Minority Under-Represented Adult Learners in Computing (CAREPATH MURAL): Katherine Hansen, M.Ed., School of Education; David Shepherd, Ph.D., College of Engineering

Promoting student engagement in anti-racist activities: Evaluation of CSIJ 200valuation: Nao Hagiwara, Ph.D., College of Humanities and Sciences; Mignonne Guy, Ph.D., College of Humanities and Sciences

VCU Breakthroughs Fund

The Effect of Parent-Driven Positive Behavior Interventions on Challenging Behavior Reduction and Home/Community Participation for Military Dependents with ASD: Lauren Avellone, Ph.D., School of Education; Kelli Gary, Ph.D., College of Health Professions

Symmetry, Surfaces, and Knots: Empowering Middle School Students through Experiential Activities in Geometry: Visala Satyam, Ph.D., College of Humanities and Sciences; Marco Aldi, Ph.D., College of Humanities and Sciences; Christine Lee Bae, Ph.D., School of Education; Allison Moore, Ph.D., College of Humanities and Sciences; Nicola Tarasca, Ph.D., College of Humanities and Sciences

Inconspicuous Extremism: Using Deep Learning, Distant Supervision and Panel Surveys to Uncover the Microfoundations of Far-Right Social Media Influence: David Webber, Ph.D., Wilder School of Government and Public Affairs; Ugochukwu Etudo, Ph.D., School of Business; Christopher Whyte, Ph.D., Wilder School of Government and Public Affairs

Merging Developmental and Educational Perspectives on Ethnic-Racial Identity and Ethnic-Racial Socialization to Foster Culturally Responsive Education: Chelsea Williams, Ph.D., College of Humanities and Sciences; Fantasy Lozada, Ph.D., College of Humanities and Sciences; Hillary Parkhouse, Ph.D., School of Education; Jesse Senechal, Ph.D., School of Education

VCU Commercialization Fund

Solar-powered, modular refrigeration for food storage: Stephen Fong, Ph.D. VCU Life Sciences; in collaboration with Everett Carpenter, Ph.D, co-director of VCU Nanoscience and Nanotechnology Program

Optimizing Health

VCU Quest Fund

Development of a system for genetically manipulating the obligate intracellular pathogen *Orientia tsutsugamushi*: Jason Carlyon, Ph.D., School of Medicine

The Development of Candidate Items to Assess Prosthesis Awareness in Individuals with Upper Extremity Amputation: Benjamin Darter, PT, Ph.D., College of Health Professions

Developing Methods to Make Oral Buprenorphine Dosing Possible for Treating Opioid Addiction: Phillip Gerk, Ph.D., School of Pharmacy

Structural Basis of Activity of Transient Receptor Potential Mucolipin: Youzhong Guo, Ph.D., School of Pharmacy, Ian Ramsey, Ph.D., School of Medicine

Investigating the mechanical coupling of leader and follower cells to drive collective cell migration: Priscilla Hwang, Ph.D., School of Engineering

Structure and Function of Phage-Related Ribosomal Protease - A Novel Antibiotic Target in *Staphylococcus aureus*: Aaron May, Ph.D., School of Pharmacy

Novel therapeutic targets for developing effective pharmacotherapeutics to treat cocaine addiction: Sammanda Ramamoorthy, Ph.D., School of Medicine

Prenatal opioids, infant sleep, and the gut microbiome: Amy Salisbury, Ph.D., School of Nursing, Lisa Brown, Ph.D., School of Nursing, Karen Hendricks-Muñoz, M.D., School of Medicine, R.K. Elswick, Ph.D., School of Nursing

Methods for integrating longitudinal multi-omics data with application to pre-term birth prediction: Ekaterina Smirnova, Ph.D., School of Medicine

Wnt3a is a controller for *P. gingivalis*-induced PD-L1 and CD8 T cell activity: Huizhi Wang, Ph.D. M.D., School of Dentistry

VCU Accelerate Fund

Discovering treatment targets in the lung-brain inflammatory axis in a pre-clinical model of acute lung injury: Rebecca Heise, Ph.D., College of Engineering; Dong Sun, M.D., Ph.D., School of Medicine

Energy Transduction in Type IV Pilus Biogenesis: Michael Donnenberg, M.D., School of Medicine; Montserrat Samsó, Ph.D., School of Medicine

Exploring new biological targets to combat psychostimulant use disorder: Jose Eltit, Ph.D., School of Medicine; Matthew Banks, Ph.D., School of Medicine

Sphingosine Kinase 2 in Sexual Dimorphism of Hepatocellular Carcinoma: Christopher Green, Ph.D., School of Medicine; Mikhail Dozmorov, Ph.D., School of Medicine; Sarah Spiegel, Ph.D., School of Medicine

VCU Breakthroughs Fund

In vitro and In Silico Hybrid Methods for Optimal and Consistent Nose-to-Brain Delivery of Novel Insulin-Loaded Nanocarriers to Treat Alzheimer's Disease: Laleh Golshahi, Ph.D., College of Engineering; Michael Hindle, Ph.D., School of Pharmacy; Worth Longest, Ph.D., College of Engineering

Rational structure-based design of novel psychoplastogens: Javier González-Maeso, Ph.D., School of Medicine; Malgorzata Dukat, Ph.D., School of Pharmacy

Elucidation of the Mechanistic Basis for the Association between Sneathia and Human Papillomavirus: Kimberly Jefferson, Ph.D., School of Medicine; Claire James, Ph.D., School of Dentistry; Iain Morgan, Ph.D., School of Dentistry

Development of a novel virtual reality treatment for emerging adults with ADHD: Joshua Langberg, Ph.D., College of Humanities and Sciences; David Shepherd, Ph.D., College of Engineering

Novel MOR antagonists to treat fentanyl overdose: Yan Zhang, Ph.D., School of Pharmacy; William Dewey, Ph.D., School of Medicine

VCU Commercialization Fund

Click Hydrogel Technology GMP Safety Study: Barbara Boyan, Ph.D., College of Engineering

Development of TMEM219 mAb as a targeted therapy for triple-negative breast cancer: Youngman Oh, Ph.D., College of Engineering

A Self-decontaminating Nanofibrous Face Mask: Wei-Ning Wang, Ph.D., College of Engineering; in collaboration with Ping Xu, Ph.D., VCU School of Dentistry, Zan Zhu doctoral student of VCU College of Engineering

Small circular mRNA vaccine: a novel platform of mRNA vaccine: Julian Zhu, Ph.D., School of Pharmacy

Utilizing Decellularized Skeletal Muscle for Regenerative Medicine Applications: Michael McClure, Ph.D., College of Engineering

Novel Cancer Immunotherapy: Julian Zhu, Ph.D., School of Pharmacy

Membrane polymers for use in structural biology and drug discovery: Youzhong Gou, Ph.D., School of Pharmacy

Dry Powder Aerosol Device for Targeted Nasal Drug Delivery: Worth Longest, Ph.D., College of Engineering

Supporting Sustainable Energy and Environments

VCU Accelerate Fund

Experiments and modeling of the immune response and energy dynamics in corals: Nastassja Lewinski, Ph.D., College of Engineering; Angela Reynolds, Ph.D., College of Humanities and Sciences; Rebecca Segal, Ph.D., College of Humanities and Sciences

Multi-Objective Optimization of Inlet Nozzle Design using Artificial Intelligence for Single Tank Thermal Energy Storage: Lane Carasik, Ph.D., College of Engineering; Alberto Cano, Ph.D., College of Engineering

Seeking Sustainability in a High-Risk Environment: Christopher Stevenson, Ph.D., College of Humanities and Sciences; Amy Rector, Ph.D., College of Humanities and Sciences; Mar Góngora Davis, Ph.D., College of Humanities and Sciences

VCU Breakthroughs Fund

Energy Efficient Neurocomputer (E2N): Jayasimha Atulasimha, Ph.D., College of Engineering; Dean Krusienski, Ph.D., College of Engineering; Cheng Ly, Ph.D., College of Humanities and Sciences

Additive Manufacturing of Anisotropic Alnico Permanent Magnets: Radhika Barua, Ph.D., College of Engineering; Everett Carpenter, Ph.D., College of Humanities and Sciences; Afroditi Filippas, Ph.D., College of Engineering

Integrating Climate-Driven Environmental Changes and Public Health Outcomes: Gregory Garman, Ph.D., Life Sciences; Alex Krist, M.D., School of Medicine

VCU Commercialization Fund

Prototype Development of an Industrial-Scale Powder Holder (Magnetic/Electric Biasing) for Magnetron Sputtering: Carlos Castano, Ph.D., College of Engineering;