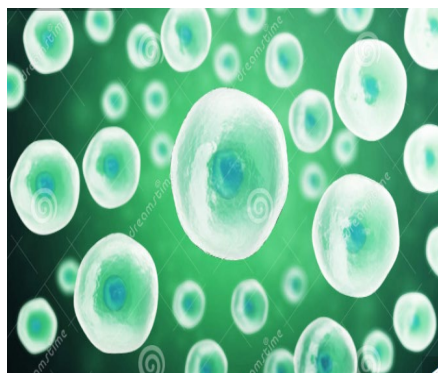
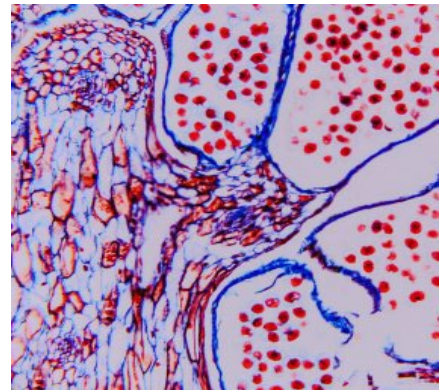
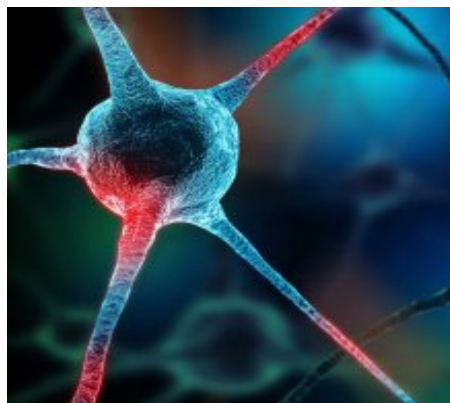


Commonwealth Health Research Board (CHRB)

2021/2022 Annual Report





Commonwealth Health Research CHRB [CHRB] FY 2021/2022 Annual Report

Goals, Purposes and Accomplishments of the Commonwealth Health Research Board (CHRB)



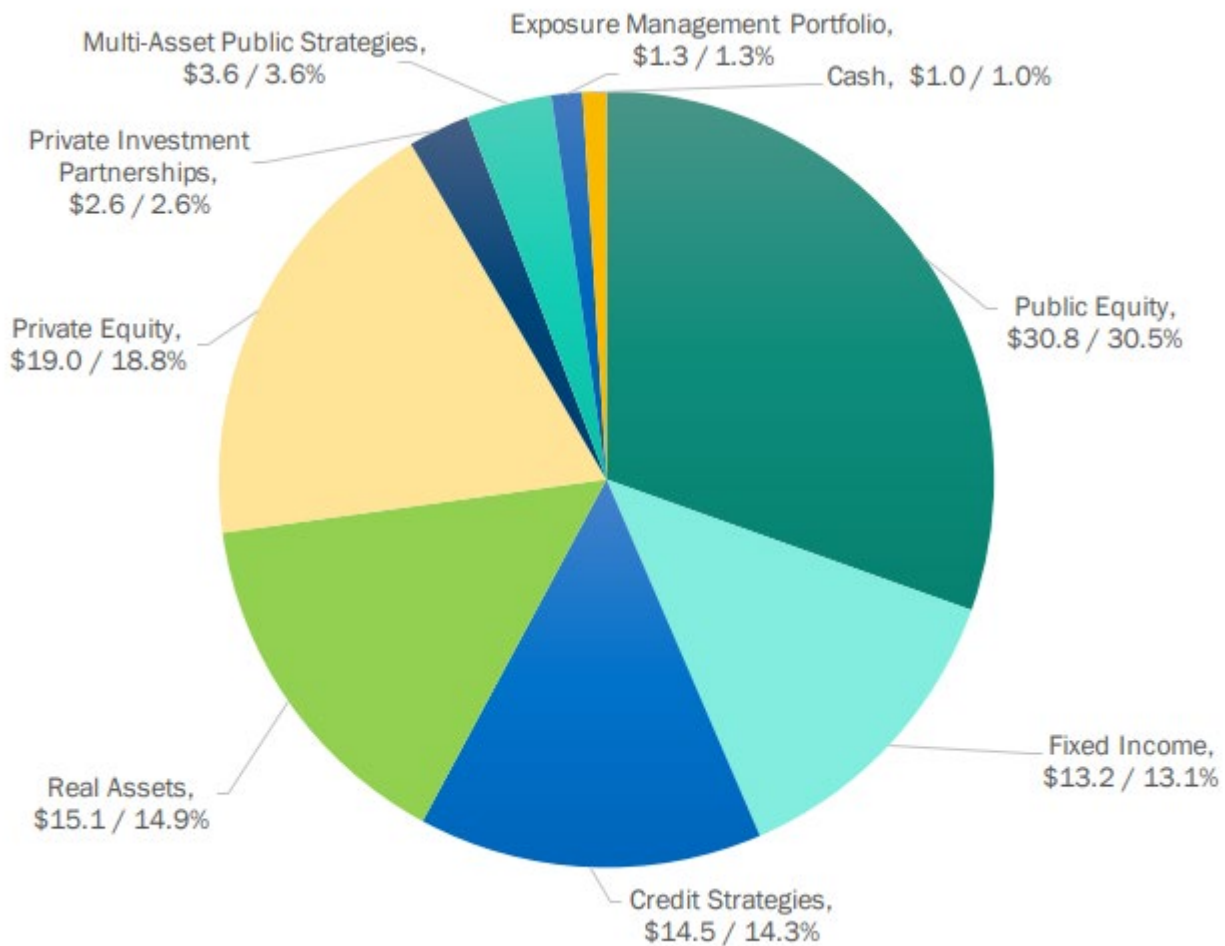
The Commonwealth Health Research Board (CHRB or Board) was created by **Virginia Code §32.1-162.23** to provide financial support—in the form of grants, donations, or other assistance—for research efforts having the potential of maximizing human health benefits for the citizens of the Commonwealth. Research efforts eligible for support by the Board may include traditional medical and biomedical research relating to the causes and cures of diseases, as well as research related to health services and the delivery of health care.

In accordance with **Virginia Code §32.1-162.24**, the Board encourages collaborative research efforts among two or more institutions or organizations, gives priority to those research efforts where Board support can be leveraged to foster contributions from federal agencies or other entities, and supports both new research efforts and the expansion or continuation of existing research efforts. CHRB grant recipients — for grant awards life-to-date — have leveraged over **\$38.2 million** in additional private and federal grant funds to further their research studies. Additionally, numerous publications in peer-reviewed scientific journals and periodicals as well as presentations of the data at regional and national scientific meetings have resulted from CHRB grant funded research projects.

Commonwealth Health Research Fund [CHRF]

Virginia Code § 51.1-124.36 delegates the authority to invest and manage the assets of the Commonwealth Health Research Fund (CHRF) to the Virginia Retirement System (VRS). Assets of the CHRF are pooled with the \$101.2 billion VRS investment fund [as of June 30, 2022]; however, the provision requires the VRS to maintain a separate accounting for the CHRF assets. The estimated value of the CHRF as of June 30, 2022 was almost \$46.6 million.

VRS current Asset allocation as of June 30, 2022:



The Department of Accounts serves as the fiscal agent for the Commonwealth Health Research Board through a Memorandum of Understanding. Audits are conducted every two years by the Auditor of Public Accounts.



Commonwealth Health Research CHRB [CHRB] FY 2021/2022 Annual Report

CHRB Current and Historical Funding

Since its inception, the CHRB has made 260 grant awards totaling almost **\$22.2 million** in grant funding to institutions of higher education and other not-for-profit or nonprofit organizations that conduct health, or health-related research in Virginia. When the required 33% matching funds are added to the CHRB funded amount, the cumulative funding totals approximately **\$32.1 million** for health research in Virginia. For a description of past CHRB grant awards and abstracts, visit CHRB's website at www.chrb.org.

Grant Year	Total Grant Awards	Number of New Grant Awards	Number of Ongoing Grant Awards	CHRB Grant Awards	Grantee Matching Funds	Total Project Funds
1999	9	9	0	\$597,377	\$272,041	\$869,418
2000	11	11	0	\$717,442	\$305,309	\$1,022,751
2001	13	13	0	\$825,590	\$344,954	\$1,170,544
2002	12	12	0	\$718,382	\$344,603	\$1,062,985
2003	8	8	0	\$509,806	\$199,999	\$709,805
2004	14	10	4	\$868,514	\$367,202	\$1,235,716
2005	10	6	4	\$755,436	\$305,909	\$1,061,345
2006	12	8	4	\$954,058	\$451,983	\$1,406,041
2007	12	7	5	\$1,105,585	\$512,493	\$1,618,078
2008	12	8	4	\$1,102,030	\$446,400	\$1,548,430
2009	8	2	6	\$727,615	\$310,338	\$1,037,953
2010	9	7	2	\$775,105	\$312,808	\$1,087,913
2011	11	5	6	\$1,061,644	\$397,212	\$1,458,856
2012	8	6	2	\$799,746	\$327,186	\$1,126,932
2013	8	5	3	\$746,688	\$372,766	\$1,119,454
2014	11	6	5	\$1,017,500	\$558,485	\$1,575,985
2015	13	7	6	\$1,213,983	\$645,285	\$1,859,268
2016	11	6	5	\$1,077,444	\$526,569	\$1,604,013
2017	11	6	5	\$1,019,696	\$445,311	\$1,465,007
2018	13	8	5	\$1,251,185	\$577,194	\$1,828,379
2019	14	8	6	\$1,399,997	\$583,883	\$1,983,880
2020	16	8	8	\$1,517,067	\$700,610	\$2,217,677
2021	14	8	6	\$1,400,000	\$653,582	\$2,053,582
Cumulative Total	260	174	86	\$22,161,890	\$9,962,122	\$32,124,012

Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Comparison of Grant Award Success Rates (based upon a five-year average)

Step 1: Concept Paper to Step 2: Submission of a Full Proposal	Step 2: Submission of a Full Proposal to Step 3: Presentation of the Full Proposal to the Board	Step 3: Presentation of Full Proposal to the Board to receiving a CHRB Grant Award
30%	58%	62%

Success rate from the submission of a Concept Paper to being awarded CHRB grant funding = 11%

Grants Cycle	Step 1: Concept Papers submitted	Step 2: Full Proposals submitted	% Success Full Proposals	Step 3: Full Proposals Presented	% Success Present	New Grant Awards	% Success Awards	From Step 1 to Awards
2021/2022	69	22	32%	14	64%	8	57%	12%
2020/2021	74	22	30%	11	50%	8	73%	11%
2019/2020	76	23	30%	13	57%	8	62%	11%
2018/2019	73	20	27%	14	70%	8	57%	11%
2017/2018	66	21	32%	10	48%	6	60%	9%
Cumulative 5-year Total	358	108		62		38		
Cumulative 5-year Average	72	22	30%	12	58%	8	62%	11%

Please note:

[1] This chart excludes two-year grant awards that are approved for Year 2 funding.

[2] *Beginning with the FY2016/2017 CHRB Grant Process, the number of Concept Papers allowed for submission by any one institution or organization decreased from 15 to 10 submissions. Beginning with the FY 2018/2019 CHRB Grant Process, the number of Concept Papers allowed for submission increased from 10 to 12 per institution or organization.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

CHRB Grant Awards and Funded Types or Categories of Research



The chart below provides statistics concerning the number of CHRB Grant Awards funded by type or category of research, from 1999 to 2021.

Key Codes	Disease/Research Area	1999 to 2021 Grant Awards	1999 to 2021 Grant Awards in CHRB Dollars
AG	Aging and Diseases of the Aging	6	\$710,675
BD	Behavioral Disorders	7	\$734,039
BV	Bacterial and Viral Diseases and Treatments	23	\$3,722,381
CA	Cancer and Cancer Treatment	41	\$5,356,520
CB	Cartilage and Bone	6	\$776,078
CV	Cardiovascular Disease	14	\$1,726,209
DI	Diabetes	11	\$1,380,685
DM	Drug Metabolism	2	\$125,900
DA	Drug Addiction and Alcoholism	1	\$83,350
EE	Eye and Ear Diseases	5	\$678,925
GI	Gastrointestinal Diseases	3	\$248,274
GE	Genetics	0	\$0
HS	Health Services Research	3	\$181,126
HE	Hematology	5	\$220,983
KD	Kidney Disease	3	\$340,927
LD	Lung Disease	9	\$1,084,083
ME	Metabolism	8	\$716,082
ND	Neurological Disorders	15	\$2,570,238
WH	Women's Health	7	\$751,560
PD	Psychiatric Diseases	2	\$278,382
WO	Wound Healing	1	\$76,373
ZZ	Other	2	\$399,100
	Total	174	\$22,161,890

A one-year or two-year grant award is still considered one grant award for purposes of categorizing disease/research areas.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Commonwealth Health Research Board (CHRB) FY 2021/2022 Grant Awards

Second-year funding for Two-Year Grant Awards					
Principal Investigator	Submitting Institution/Organization	Grant Award \$	Recipient Matching \$	Total Project \$	Grant Title
Bahareh Behkam, Ph.D.	Virginia Polytechnic Institute and State University	\$ 100,000	\$ 60,000	\$ 160,000	Mechanobiology of Implant Infection: Effect of Surface Roughness on the Attachment Density and Phenotype of Adherent <i>Staphylococcus aureus</i>
Liheng Cai, Ph.D.	University of Virginia	\$ 100,000	\$ 33,000	\$ 133,000	Voxelated 3D Bioprinting of Multiscale Porous Scaffolds for Islet Transplantation
Daniel Conway, Ph.D.	Virginia Commonwealth University	\$ 100,000	\$ 33,000	\$ 133,000	Inhibition of cell-cell fusion as a potential mechanism for treatment of covid19
Paul Fisher, MPhil, Ph.D.	Virginia Commonwealth University	\$ 100,000	\$ 101,782	\$ 201,782	Rational Design of Cancer Invasion and Metastasis Inhibitors
Babette Fuss, Ph.D.	Virginia Commonwealth University	\$ 100,000	\$ 33,000	\$ 133,000	The role of LPA6 receptor signaling in myelin repair
Daeha Joung, Ph.D.	Virginia Commonwealth University	\$ 100,000	\$ 33,000	\$ 133,000	3D Printing Living Platform for Spinal Cord Regeneration
Aurora Esquela Kerscher, Ph.D.	Eastern Virginia Medical School	\$ 100,000	\$ 50,000	\$ 150,000	Molecular dissection of a microRNA cluster network of aggressiveness
Kyle Lampe, Ph.D.	University of Virginia	\$ 100,000	\$ 33,000	\$ 133,000	Self-assembling, shear-thinning peptide hydrogels to support cell transplantation and host cell interaction after ischemic stroke
Jeffrey Moran, Ph.D.	George Mason University	\$ 100,000	\$ 58,900	\$ 158,900	Patient-Derived Hydrogel-Based In Vitro Models of Idiopathic Pulmonary Fibrosis for Assessment of Targeted Nanoparticle Therapies
Yuchin Albert Pan, Ph.D.	Virginia Polytechnic Institute and State University	\$ 100,000	\$ 33,000	\$ 133,000	Identification of novel molecular factors underlying cellular resilience to early-life stress
Alicia Pickrell, Ph.D.	Virginia Polytechnic Institute and State University	\$ 100,000	\$ 60,000	\$ 160,000	STING-dependent Type I Interferon Response in TBI
Lee Solomon, Ph.D.	George Mason University	\$ 100,000	\$ 58,900	\$ 158,900	An environmentally responsive peptide material capable of oxygen delivery
Zequan Yang, M.D., Ph.D.	University of Virginia	\$ 100,000	\$ 33,000	\$ 133,000	Topical Neck Cooling Attenuates Acute Myocardial Infarction
Chongzhi Zang, Ph.D.	University of Virginia	\$ 100,000	\$ 33,000	\$ 133,000	Aberrant CTCF binding as an epigenetic signature of cancer
		\$1,400,000	\$653,582	\$ 2,053,582	



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

FY 2021/2022 Grant Award Project Summaries



The Commonwealth Health Research Board [CHRB] has awarded **\$1,400,000** in grants to 14 medical and health researchers in Virginia.

Virginia Polytechnic Institute and State University

Principal Investigator: Bahareh Behkam, Ph.D.

Grant Award: \$100,000

Grant Title: *Mechanobiology of Implant Infection: Effect of Surface Roughness on the Attachment Density and Phenotype of Adherent Staphylococcus aureus*

Project Summary: The increasing demand for orthopedic implants in our aging society, coupled with a dramatic increase in the emergence of antibiotic-resistant bacterial strains has made implant infection control progressively challenging and costly. Bacterial adhesion and biofilm formation on implants play important roles in infection and treatment resistance. It has been demonstrated by us and others that nanoscale surface features significantly affect microbial adhesion and viability; however, the physical and biological underpinnings of microbe-nanostructure interactions remain largely unknown. We propose to nanofabricate topographical features of well-defined sizes and spacing on titanium implants and investigate the effect of the nanostructures on the attachment density and biological activity of *Staphylococcus aureus*, the most common etiological agent for orthopedic infections. Through understanding the mechanisms by which the physical properties of engineered surfaces regulate adherent bacteria behavior, this proposal has the potential to uncover novel non-toxic antimicrobial strategies for mitigating medical implant infection.

University of Virginia

Principal Investigator: Liheng Cai, Ph.D.

Grant Award: \$100,000

Grant Title: *Voxelated 3D Bioprinting of Multiscale Porous Scaffolds for Islet Transplantation*

Project Summary: This project seeks to develop a novel platform encapsulation technology for islet transplantation to treat type 1 diabetes (T1D). We do so by integrating super biocompatible alginate (1-Y15) and our newly invented 3D bioprinting technique that enables the digital assembly of 0D spherical hydrogel voxels. Preliminary studies demonstrate that voxelated bioprinting permits the fabrication of mechanically robust 3D structures formed by interconnected yet distinguishable sub-millimeter hydrogel particles in which are encapsulated islets. We hypothesize that such a multiscale porous structure, when being made by Z1-Y15 alginate with optimized viscoelasticity, enables immunoprotection, cell viability, transport, and ease retrievability, thereby providing an ideal scaffold for islet transplantation. To test this, we assemble a team with complementary expertise in biomaterials, engineering, and islet physiology and transplantation. This project will yield new means to treat T1D and novel technologies that enable engineering highly heterogeneous yet tightly organized tissue reconstructs for basic and applied biomedicine.

Virginia Commonwealth University

Principal Investigator: Daniel Conway, Ph.D.

Grant Award: \$100,000

Grant Title: *Inhibition of cell-cell fusion as a potential mechanism for treatment of covid19*

Project Summary: Limited therapies are available for COVID-19, in part due to a lack of understanding of how SARS-CoV-2 (SARS2) virus interacts with and affects host cells. This proposal is focused around developing a comprehensive understanding of the process by which SARS2 fuses host cells together, to form large, multi-nucleated cells, known as syncytia. SARS2 has increased syncytia formation, as compared to the original SARS virus, suggesting syncytia formation is a critical aspect of SARS2 pathogenicity. The PI (Conway) and co-I (Narayanan) have expertise in biophysics and live cell imaging and virology, respectively. The Narayanan group has found Maraviroc, an FDA-approved anti-viral, inhibits SARS2 viral replication. The Conway group has identified a potential mechanism of action, showing that Maraviroc inhibits the formation of syncytia. Data from this proposal will be critical for design of new targeted approaches to inhibit syncytia formation, which may have therapeutic value for treatment of COVID19 infection.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Virginia Commonwealth University

Principal Investigator: Paul Fisher, MPhil, Ph.D.

Grant Award: \$100,000

Grant Title: *Rational Design of Cancer Invasion and Metastasis Inhibitors*

Project Summary: Approximately 90% of patient deaths from solid cancers result from metastasis. Melanoma differentiation associated gene-9 (*mda-9*) is a key genomic element in diverse cancers that controls invasion and metastasis. We developed a first generation novel pharmacological inhibitor of MDA-9, PDZ1i that profoundly suppresses cancer cell spread, invasion and metastasis in a broad-spectrum of human cancers in preclinical animal models. Our central goal, is to develop effective pharmacological *in vivo* inhibitors of cancer migration/invasion/metastasis. We will apply rationally-designed medicinal chemistry approaches to produce the next generation PDZ1i (NG-PDZ1i) and PDZ2i with further enhanced anti-metastatic properties. To ensure achieving this endpoint we will use two innovative strategies we have developed, i.e., semi-high throughput screening assays in zebrafish and invasion assays using cultured mammalian tumor cells. Developing NG-PDZ1i and PDZ2i will provide significant societal health benefits and enhance the economy of VA through growth of a biotechnology company, InVaMet Therapeutics.

Virginia Commonwealth University

Principal Investigator: Babette Fuss, Ph.D.

Grant Award: \$100,000

Grant Title: *The role of LPA6 receptor signaling in myelin repair*

Project Summary: There are currently no neuroprotective therapies for debilitating diseases, such as Multiple Sclerosis (MS), where damage to the myelin sheath, which enwraps and protects central nervous system (CNS) nerve fibers, causes chronic nerve fiber degeneration and neurological disability. An emerging concept toward the development of novel treatment options is seen in the characterization of signals that are present in the demyelinating CNS and impede the repair capabilities of CNS myelinating cells, namely oligodendrocytes (OLGs). In this context, our novel findings suggest that the lipid signaling receptor LPA6 significantly contributes to such impediments in myelin repair. Notably, while lipid signaling has been described to be dysregulated under demyelinating conditions, its precise role in the regulation of CNS remyelination is not fully understood. Thus, in the long-term, our studies are anticipated to lead to the identification of novel therapeutic targets for stimulating myelin repair under pathologic conditions such as MS.

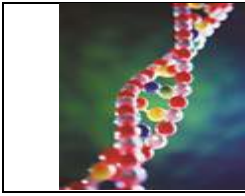
Virginia Commonwealth University

Principal Investigator: Daeha Joung, Ph.D.

Grant Award: \$100,000

Grant Title: *3D Printing Living Platform for Spinal Cord Regeneration*

Project Summary: Spinal Cord Injury currently has no effective therapies that enable the restoration of disrupted signals in the impaired sites to re-establish function due to architectural and functional complexity. This project aims to develop an advanced biomanufacturing process for constructing living scaffolds using 3D printing and origami-inspired assembly that permit the use of multi-materials. The objectives of this research include: (1) develop origami-inspired folding processes to transform 3D printed plane structures into a three-dimensional scaffold, overcoming the limitations of the compatibility with a broad spectrum of biomaterials; and (2) embedded electrodes within the scaffold to deliver targeted electrical stimulation for cell growth. The integrated technology will bridge the gap between advanced biomanufacturing science and neural regeneration, ultimately promoting interdisciplinary efforts to develop life-altering clinical treatments for patients who sustain Spinal Cord Injuries in Virginia and beyond.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Eastern Virginia Medical School

Principal Investigator: Aurora Esquela Kerscher, Ph.D.

Grant Award: \$100,000

Grant Title: *Molecular dissection of a microRNA cluster network of aggressiveness*

Project Summary: Prostate cancer (PCa) is the most prevalent form of cancer in Virginian males. Our state's PCa mortality rate is ranked 8th in the nation. This proposal will develop more effective theranostic tools for this disease, focusing on the microRNA (miRNA) class of small noncoding RNAs. MiRNA dysregulation is a common feature of PCa but little is known how they functionally interact as a cancer network to promote disease progression. We will investigate this problem by studying the miR-888 cluster, which consists of seven miRNA genes mapping close together on human chromosome X within a hereditary PCa locus. We found that the miR-888 cluster is elevated in patients with aggressive PCa and induces proliferation, invasion, and tumor formation. Our integrated translational research team (EVMS, University of Virginia) will use high throughput CRISPR gene editing, proteomics, nanostring technology and anti-miR reagents to molecularly dissect the miR-888 cluster and validate its clinical potential.

University of Virginia

Principal Investigator: Kyle Lampe, Ph.D.

Grant Award: \$100,000

Grant Title: *Self-assembling, shear-thinning peptide hydrogels to support cell transplantation and host cell interaction after ischemic stroke*

Project Summary: Stroke is the third leading cause of death in the US and 20% of stroke survivors are so significantly disabled that they cannot walk without help. Despite broad research, stroke and other disorders of the brain and spinal cord continue to be the leading cause of disability nationwide. No treatment exists to rebuild neural tissue destroyed by ischemic stroke and the subsequent cell death. We propose a new engineered biogel to transplant neural stem cells (NSCs), and encourage growth of host NSCs and vascular cells into the infarct site. These materials are designed to be injectable and cell compatible, and thus may improve NSC transplantation survival. Establishing this collaboration will support future development, especially early insight to biogel interventions in a rat model of ischemic stroke. The aims will provide important materials development and characterization and pre-clinical data toward supporting cell growth and decreasing or reversing stroke-induced brain damage.

George Mason University

Principal Investigator: Jeffrey Moran, Ph.D.

Grant Award: \$100,000

Grant Title: *Patient-Derived Hydrogel-Based In Vitro Models of Idiopathic Pulmonary Fibrosis for Assessment of Targeted Nanoparticle Therapies*

Project Summary: Idiopathic pulmonary fibrosis (IPF) is a lung disorder that kills more Americans per year than breast cancer. Its cause is poorly understood and the typical survival time is less than 5 years. IPF progression is known to depend on interactions between cells and their surrounding environment. Here, we will synthesize biomaterials that match the protein composition of real fibrotic lung tissue and use them as platforms to test new nanoparticle-based strategies to halt and possibly reverse IPF progression. Our aims are (1) synthesize decellularized hydrogels and quantify effects of changes in stiffness and pore size on disease progression in vitro; (2) test efficacy of nanoparticles, propelled by magnetic fields or ultrasound, to penetrate tissue and deliver medication to targeted locations. This work will yield insight into the effects of tissue mechanics on IPF progression and could enable lower required doses for IPF medication, reduced side effects and improved patient outcomes.

Virginia Polytechnic Institute and State University

Principal Investigator: Yuchin Albert Pan, Ph.D.

Grant Award: \$100,000

Grant Title: *Identification of novel molecular factors underlying cellular resilience to early-life stress*

Project Summary: In modern society, stress is a common occurrence in everyday life. The brain's stress-response system (the hypothalamic-pituitary-adrenal axis) helps us adapt to stress, but it is vulnerable to severe or chronic stress, especially during early-life periods. Malfunction of the stress system contributes to severe mental illnesses (e.g., PTSD and major depressive disorders), which is a growing public health issue in Virginia. Novel mechanistic understanding of how the stress system responds to early-life stress is critical to developing novel therapeutic interventions. Using animal models, we will perform an unbiased gene expression analysis to identify molecular factors capable of enhancing the resilience of neurons to early-life stress. The findings from the proposed study could be applied to future therapeutic interventions to prevent or remedy the adverse effects of early-life stress.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Virginia Polytechnic Institute and State University

Principal Investigator: Alicia Pickrell, Ph.D.

Grant Award: \$100,000

Grant Title: *STING-Dependent Type 1 Interferon Response in TBI*

Project Summary: Traumatic brain injury (TBI) is the most commonly acquired central nervous system (CNS) injury affecting both civilian and military populations in the United States. This highly complex, heterogeneous epidemic results in excessive morbidity and long-term disability for an estimated 5.3 million Americans with an annual economic cost of \$37.8 billion. In Virginia (VA), over 2% of the population suffer from disabilities related to TBI, and an estimated 28,000 Virginians sustain a TBI annually. Inflammation in the brain after the mechanical insult contributes to neurodegeneration affecting functional outcomes for patients. In our published and preliminary data, we profiled a novel immune response in a preclinical mouse model of TBI. TBI-injured mice showed an abnormal upregulation of Type I interferons. In this proposal, we plan to characterize this novel interferon pathway after TBI to decipher whether targeting interferon signaling therapeutically reduces inflammation and neurodegeneration in the brain after injury.

George Mason University

Principal Investigator: Lee Solomon, Ph.D.

Grant Award: \$100,000

Grant Title: *An environmentally responsive peptide material capable of oxygen delivery*

Project Summary: Despite an urgent need and years of study, there are no suitable blood substitutes that can be routinely used. Relying on donations is also troublesome as the blood can be contaminated with undiagnosed illnesses and is difficult to store. We propose to develop a blood substitute made from a novel peptide material, which binds heme B, the same cofactor found in human hemoglobin. For this stage of the work, we will optimize the material by changing the peptide sequence to promote stronger oxygen binding and tuning the environmental responses to be more aligned with physiological conditions. These peptides are highly modifiable and can be designed so they do not stimulate the immune system and be more stable than standard blood for long term storage. This work will serve as pilot studies for developing a next generation blood substitute that will help all Virginians suffering from hemorrhage inducing injuries.

University of Virginia

Principal Investigator: Zequan Yang, M.D., Ph.D.

Grant Award: \$100,000

Grant Title: *Topical Neck Cooling Attenuates Acute Myocardial Infarction responsive peptide material capable of oxygen delivery*

Project Summary: Myocardial infarction (MI, heart attack) accounts for the vast majority of death associated with ischemic heart disease. The key to salvage the dying heart muscle is to shorten the transportation time to the hospital. However, the prehospital management to protect the heart is sadly lacking. Mild systemic hypothermia is found to be protective against MI. However, the protection is observed only when hypothermia is achieved early during the heart attack. Induction of systemic hypothermia is resource intensive and difficult to start outside hospital. The delay in initiating the hypothermia is unlikely to be solved. A therapy, that is portable and easy to apply at the onset of heart attack, may provide better heart protection. We found that topical neck cooling could attenuate MI similar as systemic hypothermia. This application will further define the mechanisms underlying the topical neck cooling and modify the device for use in big animal model.

University of Virginia

Principal Investigator: Chongzhi Zang, Ph.D.

Grant Award: \$100,000

Grant Title: *Aberrant CTCF binding as an epigenetic signature of cancer*

CTCF is a protein that can function as a chromatin insulator and facilitates chromatin looping. Disruption of individual CTCF binding sites in the human genome have been reported in several cancers that associate with altered chromatin structure and dysregulation of genes in the chromatin domains. Our preliminary studies show that cancer-specific CTCF binding events are common in many cancers, and the level of aberrant CTCF binding in each cancer type is correlated with clinical outcome. We hypothesize that CTCF binding aberration is an epigenetic signature of cancer. In this project, we propose to use novel integrative computational genomics approaches to systematically characterize aberrant CTCF binding events in the genome in several human cancer systems and their function in gene regulation.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Commonwealth Health Research Funds available for FY 2021/2022 Grant Awards



Pursuant to *Virginia Code* §32.1-162.28(E), (CHRF) Grant funding is calculated by an amount not to exceed six percent of the moving average of the market value of the CHRF calculated over the previous five years on a one-year delayed basis, net of any administrative fee assessed pursuant to subsection E of § 51.1-124.36.



Funds available for 2021 Grant Awards

Calendar Year		Market Value as of 12/31/xx	
January 1 - December 31, 2015	Year 1	\$34,052,161.12	Source: VRS Finance Division Activity Report through December 31, 2015
January 1 - December 31, 2016	Year 2	\$35,296,332.08	Source: VRS Finance Division Activity Report through December 31, 2016
January 1 - December 31, 2017	Year 3	\$38,776,234.09	Source: VRS Finance Division Activity Report through December 31, 2017
January 1 - December 31, 2018	Year 4	\$36,998,370.93	Source: VRS Finance Division Activity Report through December 31, 2018
January 1 - December 31, 2019	Year 5	\$40,977,689.88	Source: VRS Finance Division Activity Report through December 31, 2019
	Total	\$186,100,788.10	
	Average Market Value	\$37,220,157.62	
Funds available for 2021 grants based on 5% of the average market value	5.00%	1,861,007.88	



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

**Commonwealth Health Research Board (CHRB)
Summary of FINAL FY 2021/2022 Administrative and Grant Expenses:**

FY 2021/2022 Revenue and Cash Balance

CHRB Revenue and Cash Balance as of June 30, 2022	\$ 755,987.25
---	----------------------

FY 2021/2022 Final Expenses

FY 2021/2022 Budget	Approved	FINAL Expenses as of June 30, 2022	Difference	Expenses as a % of Budget	Notations
Administrative	\$304,625.42	\$311,561.33	\$6,935.91	102%	Majority of difference related to management services provided in May and June 2021 and paid in July 2021 (FY 2021/2022).
Grants	\$1,400,000	\$1,249,649.59	\$150,350.41	89%	Majority of funds disbursed in July 2021 for initial and ongoing grant payments.



Commonwealth Health Research CHRB [CHRB]
FY 2021/2022 Annual Report

Commonwealth Health Research Board (CHRB) Members

Robert W. Downs, Jr., M.D., Chair
Eric Lowe, M.D., Vice Chair
Thomas W. Eppes, Jr., M.D.
Francis X. Farrell, Ph.D.
Cynda A. Johnson, M.D., M.B.A.
Ethlyn McQueen-Gibson, DNP
Julia Spicer

Commonwealth Health Research Board (CHRB) Administrator

Anne C. Pace, M.P.A.
Commonwealth Health Research Board
Post Office Box 1971 (Mailing)
101 N. 14th Street, 2nd Floor (Delivery)
Richmond, Virginia 23218-1971
804.371.7799 Telephone Direct
804.692.0222 Fax Direct
anne.pace.chrb@doa.virginia.gov

Commonwealth Health Research Board (CHRB) Scientific Consultants

Raya Mandler, Ph.D.
Merrill Mitler, Ph.D.
Arnold Revzin, Ph.D.

