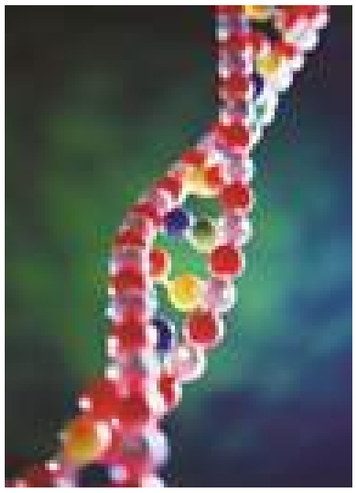

Commonwealth Health Research Board (CHRB)

2019/2020 Annual Report

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 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 $35 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]

Pursuant to Virginia Code §32.1-162.28(E), 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. The amount may be expended in a calendar year for any purpose permitted by the CHRB/CHRF's governing statutes.

Assets of the Commonwealth Health Research Fund (CHRF) are pooled with the $82.3 billion Virginia Retirement System (VRS) investment fund (as of June 30, 2019). The estimated value of the CHRF as of June 30, 2019 was almost $40.5 million. The current asset allocation for the VRS investment fund reflects: 40.1% public equity, 15.9% fixed income, 14.5% credit strategies, 13.5% real assets, 11.5% private equity, 1.3% Private Investment Partnership (PIP), 2.7% Multi-Asset Public Strategies (MAPS), and 0.5% cash.

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 2019/2020 Annual Report

Executive Summary of FY 2019/2020 Grant Process:

Institution/ Organization Identification #	Institution/Organization	Concept Papers Received	Full Proposals Requested	Presentations to the Board	Grant Awards
207	University of Virginia	12	4	3	3
208	Virginia Polytechnic Institute and State University	12	5	3	1
215	University of Mary Washington	1	0	0	0
216	James Madison University	2	0	0	0
217	Radford University	2	0	0	0
221	Old Dominion University Research Foundation	8	0	0	0
236	Virginia Commonwealth University	12	5	4	2
247	George Mason University	1	0	0	0
274	Eastern Virginia Medical School	12	3	1	1
302	Virginia College of Osteopathic Medicine	1	1	0	0
304	Sweet Briar College	1	0	0	0
307	University of Richmond	1	1	0	0
335	Hampton University	2	1	0	0
349	Washington and Lee University	2	0	0	0
395	Eastern Mennonite University	1	0	0	0
804	Carilion Medical Center	1	0	0	0
811	McGuire Research Institute	4	3	2	1
840	Inova Health System	1	0	0	0
	Total	**76**	**23**	**13**	**8**

14 presentations requested; one PI declined as moving out of state.

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 Annual Report

CHRB Current and Historical Funding

Since its inception, the CHRB has made 230 grant awards totaling approximately $19.2 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 almost $27.8 million for health research in Virginia. More detailed information is provided by year in the chart below. 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
Cumulative Total	230	158	72	$19,244,823	$8,607,930	$27,852,753

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 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
28%	52%	64%

Success rate from the submission of a Concept Paper to being awarded CHRB grant funding = 9%

Grants Cycle	Step 1: Concept Papers submitted	Step 2: Full Proposals requested	% Success Full Proposals	Step 3: Full Proposals Presented	% Success Presentations	New Grant Awards	% Success Awards	From Step 1 to Awards
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%
2016/2017*	66	17	26%	9	53%	6	67%	9%
2015/2016	91	24	26%	10	42%	7	70%	8%
Cumulative from 2015/2016 to 2019/2020 [Five Year total]	372	105	28%	56	53%	35	63%	9%
Cumulative from 2015/2016 to 2019/2020 [Five Year average]	74	21	28%	11	52%	7	64%	9%

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 will increase from 10 to 12 per institution or organization.

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 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 2019.

Key Codes	Disease/Research Area	1999 to 2019 Grant Awards	1999 to 2019 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	22	$3,122,381
CA	Cancer and Cancer Treatment	37	$4,517,835
CB	Cartilage and Bone	6	$776,078
CV	Cardiovascular Disease	13	$1,526,209
DI	Diabetes	10	$1,280,685
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	4	$120,983
KD	Kidney Disease	3	$340,927
LD	Lung Disease	7	$884,083
ME	Metabolism	8	$716,082
ND	Neurological Disorders	10	$1,870,238
WH	Women's Health	7	$751,560
PD	Psychiatric Diseases	1	$200,000
WO	Wound Healing	1	$76,373
ZZ	Other	2	$299,100
	Total	**158**	**$19,244,823**

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 2019/2020 Annual Report

Commonwealth Health Research Board (CHRB) FY 2019/2020 Grant Awards

Principal Investigator	Submitting Institution/ Organization	Grant Award $	Recipient Matching $	Total Project Funds	Grant Title
Matthew Buczynski, Ph.D.	Virginia Polytechnic Institute and State University	$ 100,000	$ 60,500	$ 160,500	Evaluation of a 12/15-LM receptor as a target for Non-Opioid Pain Therapeutics
Charles Clevenger, M.D., Ph.D.	Virginia Commonwealth University	$ 100,000	$ 36,131	$ 136,131	HDAC6 as a Therapeutic Target in Breast Cancer
Paul Dent, Ph.D.	Virginia Commonwealth University	$ 100,000	$ 50,195	$ 150,195	Novel anti-sarcoma therapies
Brent French, Ph.D.	University of Virginia	$ 100,000	$ 33,000	$ 133,000	Bioengineering of Cardiac Regeneration In Situ after Myocardial Infarction
Li Jin, Ph.D.	University of Virginia	$ 100,000	$ 73,057	$ 173,057	Could we treat acute back/leg pain with nanoparticle fullerene instead of steroid?
Peter Kasson M.D., Ph.D.	University of Virginia	$ 100,000	$ 33,000	$ 133,000	Rapid identification of entry inhibitors and neutralizing antibodies for emerging viruses
James Landers, Ph.D.	University of Virginia	$ 100,000	$ 33,000	$ 133,000	Diagnostic Assay for On-Site Detection of *Bordatella pertussis*
Alberto Musto, M.D., Ph.D.	Eastern Virginia Medical School	$ 100,000	$ 50,000	$ 150,000	Role of CD40L in Limbic Epileptogenesis
Nagaraja Nagre, Ph.D.	Eastern Virginia Medical School	$ 100,000	$ 50,000	$ 150,000	Exploring the potential role of cannabinoid receptor type-2 activation in protection against bacterial pneumonia-induced lung injury
Swati Palit Deb, Ph.D.	Virginia Commonwealth University	$ 99,997	$ 33,000	$ 132,997	Targeting mutant p53-dependent checkpoints of genome duplication in lung cancer
Bhaumik Patel, M.D.	McGuire Research Institute	$ 100,000	$ 33,000	$ 133,000	Development of a Selective Non-Saccharide Glycosaminoglycan Mimetic for Colon Cancer
Liya Qiao, Ph.D.	Virginia Commonwealth University	$ 100,000	$ 33,000	$ 133,000	Role of TrkB.T1 in Bowel and Urinary Bladder Comorbidity
Jason Reed, Ph.D.	Virginia Commonwealth University	$ 100,000	$ 33,000	$ 133,000	A new approach for detecting IGH translocations in hematologic malignancies
Martin Wu, Ph.D.	University of Virginia	$ 100,000	$ 33,000	$ 133,000	Are persister cells culprits of recurrent *Clostridium difficile* infections?
		$ 1,399,997	**$583,883**	**$1,983,880**	

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 Annual Report

FY 2019/2020 Grant Award Abstracts

The Commonwealth Health Research Board [CHRB] has awarded **$1,399,997** in grants to 14 medical and health researchers in Virginia.

Virginia Polytechnic Institute and State University
Principal Investigator: Matthew Buczynski, Ph.D.
Grant Award: $100,000
Grant Title: *Evaluation of a 12/15-LM receptor as a target for Non-Opioid Pain Therapeutics*

The opioid crisis has reached epidemic proportions in the United States, and in 2016 Governor McAuliffe declared opioid addiction in the Commonwealth to be a Public Health Emergency. Rural western VA reports some of the highest per capita opioid abuse in the country. New non-opioid therapeutic alternatives to NSAIDs (Nonsteroidal Anti-inflammatory Drugs, e.g., ibuprofen) for the effective management of chronic pain are essential to limiting opioid overuse. The Buczynski group has identified a novel class of signals (12/15-lipoxygenase metabolites, 12/15-LMs) that contribute directly to (NSAID)-insensitive nociceptive behaviors in multiple pre-clinical pain models, and preliminary results revealed a novel receptor for 12/15-LMs. This project would characterize the 12/15-LM receptor, and screen potential lead compounds that block receptor activity. The ultimate goal is to enable drug discovery efforts for novel analgesics with minimal abuse potential and to mitigate risks of opiate misuse, diversion and addiction.

Virginia Commonwealth University
Principal Investigator: Charles Clevenger, M.D., Ph.D.
Grant Award: $100,000
Grant Title: *HDAC6 as a Therapeutic Target in Breast Cancer*

Funding continues for Dr. Clevenger to explore a new target for drugs to treat breast cancer. Breast cancer is a major health problem in the US. Over 1000 Virginia women die of breast cancer each year. The PI and his team have identified histone deacetylase, HDAC6, and discovered that it can remove acetyl groups from proteins and thereby act as a signaling switch. The PI and his team hypothesize that HDAC6 globally controls breast cancer gene expression and growth, by functioning as an “oncogenic node”. Phase I trials in myeloma patients have shown that small molecular inhibitors of HDAC6 are safe and could be therapeutically used in breast cancer patients. The team will conduct *in vitro* studies using the advance technique of immunoprecipitation sequencing (ChIP-Seq) in breast cancer lines to identify the genome-wide relationships between HDAC6/HMGN2/H1.2 on promoter/enhancer chromatin both in terms of occupancy and co-localization. Also planned are translational *in vivo* studies in a mouse model of breast cancer.

Virginia Commonwealth University
Principal Investigator: Paul Dent, Ph.D.
Grant Award: $100,000
Grant Title: *Novel anti-sarcoma therapies*

Sarcomas, while relatively rare, are a heterogeneous group of tumors that are quite difficult to treat. The drug pazopanib is an approved therapeutic for sarcomas, and Dr. Dent has found that a class of drugs known as histone deacetylase inhibitors, including sodium valproate, increase the lethality of pazopanib in sarcoma cells. This CHRB project will use a mouse model of sarcoma tumors to continue studies of pazopanib and valproate, plus another FDA-approved inhibitor (crizotinib) to generate data that will ultimately support a Phase I clinical trial of the three-drug combination for treatment of this devastating type of cancer.

University of Virginia
Principal Investigator: Brent French, Ph.D.
Grant Award: $100,000
Grant Title: *Bioengineering of Cardiac Regeneration In Situ after Myocardial Infarction*

Heart failure currently afflicts some 5.7 million Americans, and by 2030 this number will increase by 46%. The single most common cause of heart failure is heart attack (or myocardial infarction) which results in the irreversible loss of cardiac muscle. Current statistics show that ~790,000 people in the US have heart attacks each year. Of those, about 114,000 will ultimately die from heart failure. The overarching goal of this project is to combine recent advances in cardiology, radiology and gene therapy to demonstrate that cardiomyocytes can be genetically-reprogrammed to divide and replace the heart muscle lost during heart attack. This is important because the adult heart has essentially no capacity to repair itself after a heart attack. Instead, injured cardiomyocytes are replaced by scar tissue to prevent the heart from rupturing. If successful, this research will show that gene therapy can regenerate muscle tissue after heart attack.

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 Annual Report

University of Virginia
Principal Investigator: Li Jin, Ph.D.
Grant Award: $100,000
Grant Title: *Could we treat acute back/leg pain with nanoparticle fullerene instead of steroid?*

Funding continues for Dr. Jin to explore new molecules/drugs for treating low back pain. Intervertebral disc herniation is the most common cause of low back pain which, in turn, is a leading source of disability in adults. Fullerenes are forms of carbon having a large spheroidal molecule consisting of a hollow cage of atoms, of which buckminsterfullerene was the first known example. Some fullerenes, including C60, C70 and C80 have been shown to be antioxidants due to delocalization of the π-electrons over the carbon cage, which can readily react with free radicals and subsequently deliver a cascade of downstream properties for numerous biomedical applications. The proposed research would characterize the anti-inflammatory effects of C80, a fullerene that the PI and his team has shown to have strong radical scavenging capability, anti-inflammatory effects and anti-oxidative effects. They plan to do in vitro and in vivo studies using C80 nanoparticles. If this approach is successful, it would point to fullerenes as possible new bases for anti-inflammatory drugs to treat low back pain and other chronic pain conditions.

University of Virginia
Principal Investigator: Peter Kasson, M.D., Ph.D.
Grant Award: $100,000
Grant Title: R*apid identification of entry inhibitors and neutralizing antibodies for emerging viruses*

Zika virus infection is a critical public health problem. This proposal is for further development of a new microfluidic flow cell approach to discover antibodies and drugs that can inhibit the entry of Zika virus into cells (thus preventing infection); the improved technology should be adaptable to other viruses as well.

University of Virginia
Principal Investigator: James Landers, Ph.D.
Grant Award: $100,000
Grant Title: *Diagnostic Assay for On-Site Detection of Bordatella pertussis*

Bordetella pertussis, the causative agent of whooping cough, infects millions of individuals worldwide each year and continues to be the world's leading cause of vaccine-preventable deaths. In recent decades, there has been an alarming resurgence of reported pertussis cases. A major contribution to addressing this problem would be an ability to rapidly detect *B. pertussis* during a suspected outbreak, enabling initiation of treatment, limitation of transmission and reduction in mortality. However, current methods require patient samples to be sent to centralized laboratories for analysis, and results are typically not available in time to support epidemiologic intervention. Instead, physicians and healthcare officials use presumptive antibiotic treatment until diagnostic results are available, thereby putting many individuals at risk unnecessarily. To address this challenge, this project would develop a portable "lab-on-a CD" microfluidic device to screen for the presence of *B. pertussis* DNA and allow for robust identification of infection in 20 min or less.

Eastern Virginia Medical School
Principal Investigator: Albert Musto, M.D., Ph.D.
Grant Award: $100,000
Grant Title: *Role of CD40L in Limbic Epilegtogenesis*

Funding continues for Dr. Musto to pursue his hypotheses that certain inflammatory processes are central in the cause and development of temporal lobe epilepsy. There is no cure for temporal lobe epilepsy, also termed, limbic epilepsy. Temporal lobe epilepsy is the most common form of epilepsy in adults. Between 4 and 10 cases occur in every 1,000 people. Available medical treatments are not effective in controlling some limbic seizures. Early mortality and numerous related medical problems make temporal lobe epilepsy a major medical problem in the US. Numerous studies, including those of the Dr. Musto, suggest that inflammation via immune system activity contributes to LE. This proposal is based on the idea that temporal lobe epilepsy develops because immune processes alter neuronal connectivity in a region of the brain called the hippocampus. Evidence of modification of neuronal dendritic spines will be sought with special focus on the protein, CD40L, which is primarily expressed on activated immune cells, known as T cells. If successful, this project would move epilepsy research into considerations of inflammatory and immune processes and point to new therapeutic approaches.

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 Annual Report

Eastern Virginia Medical School
Principal Investigator: Nagaraja Nagre, Ph.D.
Grant Award: $100,000
Grant Title: *Exploring the potential role of cannabinoid receptor type-2 activation in protection against bacterial pneumonia-induced lung injury*

Bacterial pneumonia is a major risk factor for developing acute lung injury (ALI). Although mechanical ventilation remains the last resort of treatment, it carries risks of lung cell injury, high mortality, and morbidities. *Pseudomonas aeruginosa* is an opportunistic pathogen causing a wide range of acute and chronic infections and is a major cause for Ventilator-Associated Pneumonia (VAP). The ineffectiveness of conventional antibiotics therapy among severe pneumonia-induced lung injury patients appeals for novel options of treatment. One such candidate is Cannabinoid receptor-2 (CB2R) that is predominantly expressed in immune cells. Synthetic agonists like endocannabinoids (that do not generate undesired psychotic effects) can be used to activate these CB2Rs leading to the display of anti-inflammatory functions. Considering the unique stance of CB2R as a potential novel therapy for bacterial pneumonia, the hypothesis that CB2R activation can ameliorates bacterial pneumonia induced lung inflammatory/injury (using a well-validated mouse model) will be tested in this project.

Virginia Commonwealth University
Principal Investigator: Swati Palit Deb, Ph.D.
Grant Award: $99,997
Grant Title: *Targeting mutant p53-dependent checkpoints of genome duplication in lung cancer*

The American Cancer Society estimated that the number of new lung cancer cases for this year alone is 234,030 in the US, and 5,860 in Virginia. Over 60% of these patients will not survive, underscoring the extremely poor efficacy of current lung cancer treatment. Gain-of-function (GOF) mutations of tumor suppressor p53 are very frequent (up to 70%) in lung cancer and establish resistance to chemo- or radiotherapy and are essential for oncogenesis. Accordingly, the tumorigenic ability of human lung cancer cells lines is drastically reduced or eliminated when endogenous mutant p53 is disabled. In a recently published study (highlighted by the Journal of Clinical Investigation), we demonstrated that GOFp53 activates checkpoint signaling to establish its oncogenic activities**.** Here we propose to determine the mechanism by which GOFp53 activates checkpoint signaling to establish dependency in lung cancer cells and evaluate the therapeutic efficacy of GOFp53-induced checkpoint signaling inhibitors, which has not been explored.

McGuire Research Institute
Principal Investigator: Bhaumik Patel, M.D.
Grant Award: $100,000
Grant Title: *Development of a Selective Non-Saccharide Glycosaminoglycan Mimetic for Colon Cancer*

Complete cure of cancer is never achieved for most advanced colorectal cancer in part because of the inability of the standard chemotherapy and other targeted drugs to eradicate the 'seeds of cancer', also called cancer stem cells (CSCs). We have demonstrated, for the first time that specific short sequence of heparin (HSO6) selectively eliminates CSCs. But, HSO6 cannot be a candidate drug as it is very difficult and expensive to purify it. However, we have succeeded in synthesizing a non-sugar mimetic of HSO6 – G2.2 which is easy to make, homogenous, and rather inexpensive. Using primary human CSCs, innovative animal models, and advanced in vitro methods to study stem cells, we will determine the efficacy and toxicity of G2.2 as well as its potent analogs against colon CSCs in conjunction with FDA approved colon cancer therapies. This, in our opinion, is a major step towards achieving complete cancer cure.

Virginia Commonwealth University
Principal Investigator: Liya Qiao, Ph.D.
Grant Award: $100,000
Grant Title: *Role of TrkB.T1 in Bowel and Urinary Bladder Comorbidity*

This grant award will allow the investigator to explore a new neurological mechanism in the spinal cord which is, potentially, the cause for the sensation of bladder pain in patients suffering from irritable bowel syndrome. The association between bladder hypersensitivity and irritable bowel is observed in millions of patients, although the bladder is actually normal. The investigator will test whether specialized cells in the spinal cord (glial cells) are stimulated in episodes of irritable bowel and subsequently transmit pain signals to neighboring nerves, which culminates in registering them as bladder pain. The experiments will utilize sophisticated neurological and biochemical approaches. They may reveal new therapeutic targets for relieving patients from this comorbidity.

Commonwealth Health Research CHRB [CHRB]
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Virginia Commonwealth University
Principal Investigator: Jason Reed, Ph.D.
Grant Award: $100,000
Grant Title: *A new approach for detecting IGH translocations in hematologic malignancies*

Blood cancers are a large group of different malignancies and account for roughly 10% of all cancers diagnosed in the United States each year. The complexities of blood cancer diagnosis and treatment create a critical need for molecular methods that can be applied in less specialized medical settings such as community hospitals. To address this need, it is planned to use a very simple "DNA barcoding" approach to detect chromosome rearrangements in blood cancers. This method will be as accurate as all existing alternatives, but much quicker and substantially less costly. The technology can significantly improve outcomes for patients in underserved populations.

University of Virginia
Principal Investigator: Martin Wu, Ph.D.
Grant Award: $100,000
Grant Title: *Are persister cells culprits of recurrent Clostridium difficile infections?*

Clostridium difficile infection (CDI) causes mild to life-threatening diarrhea. It poses a major healthcare burden to the global population primarily affecting individuals treated with antibiotics. The biggest challenge facing CDI is the high rate of treatment failure or recurrence, which has increased remarkably in the past two decades. Persister cells (dormant or slow-growing bacteria) are known to survive antibiotic treatment. However, whether they are a major cause of recurrent CDI remains unclear. We hypothesize that persister cells play an important role in recurrent CDI. Specifically, we aim to 1) determine whether the presence and abundance of persister cells are significant risk factors foı CDI recurrence, 2) determine the genetic basis of persistence by sequencing genomes of the persister cells. This study will be the first to quantitatively determine whether persister cells are significant risk factors for recurrent CDI and therefore has the potentialto shift the paradigm in therapeutic strategies.

Commonwealth Health Research CHRB [CHRB]
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Commonwealth Health Research Funds available for 2019 Grant Awards

Funds available for 2019 Grant Awards

Calendar Year		Market Value as of 12/31/xx	
January 1 - December 31, 2013	Year 1	$33,153,077.91	Source: VRS Finance Division Activity Report through December 31, 2013
January 1 - December 31, 2014	Year 2	$34,600,580.37	Source: VRS Finance Division Activity Report through December 31, 2014
January 1 - December 31, 2015	Year 3	$34,052,161.12	Source: VRS Finance Division Activity Report through December 31, 2015
January 1 - December 31, 2016	Year 4	$35,296,332.08	Source: VRS Finance Division Activity Report through December 31, 2016
January 1 - December 31, 2017	Year 5	$38,776,234.09	Source: VRS Finance Division Activity Report through December 31, 2017
	Total	$175,878,385.57	
	Average Market Value	$35,175,677.11	
Funds available for 2019 grants based on 5% of the average market value	5.00%	$1,758,784	
Less Administrative Expenses:			
Less Operating Expenses		$264,624	
Less VRS Administrative Fees		$2,600	
Total Administrative Expenses		$267,224	
Funds Available for 2019 grants less estimated expenses:		$1,491,560	

Investment of Funds

Assets of the Commonwealth Health Research Fund [CHRF] are pooled with the **$82.3 billion** Virginia Retirement System [VRS] investment fund. The estimated value of the CHRF as of June 30, 2019 was almost **$40.5 million**. The current asset allocation for the VRS investment fund reflects **40.1% public equity, 15.9% fixed income, 14.5% credit strategies, 13.5% real assets, 11.5% private equity, 1.3% PIP, 2.7% MAPS, and 0.5% cash.**

Source of CHRF balance: VRS Finance Division CHRF Activity Report through **June 30, 2019** shows CHRF balance at $40,480,607.99
Barry Faison, CPA, CGMA, Chief Financial Officer, VRS

Source of VRS Total Fund market value: Performance and Asset Allocation as of **June 30, 2019** = $82.3 billion
www.varetire.org/investments/index

Source of VRS Total Fund market value: Performance and Asset Allocation as of **June 30, 2019**
www.varetire.org/investments/index

PIP is defined as Private Investment Partnership

MAPS is defined as Multi-Asset Public Strategies

Commonwealth Health Research CHRB [CHRB]
FY 2019/2020 Annual Report

Commonwealth Health Research Board (CHRB)
Summary of FINAL FY 2018/2019 Administrative and Grant Expenses:

FINAL FY 2018/2019 (July 1, 2018 - June 30, 2019) CHRB Administrative & Grants Expenses
Administrator Pace provided the Board with FY 2018/2019 FINAL administrative and grant expenses through June 30, 2019: [Per the Commonwealth's CARDINAL accounting system]

FY 2018/2019 Revenue and Cash Balance

CHRB Revenue and Cash Balance as of June 30, 2019	$ 319,940.02

FY 2018/2019 Final Expenses

CHRB Final Expenses as of June 30, 2019	Approved	Expenses	Difference
Administrative	$ 249,871.16	$ 262,638.63	$ (12,767.47)
Grant Disbursements	$1,251,185.00	$1,080,163.05	$ 171,021.95

The majority of the shortfall was related to expenses in the categories of Attorney Services and Management Consultants. The Budget shortfall in the Attorney Services category resulted from a change in the manner of paying for services from a one-year lag in billing to paying a retainer advance with a cap of $10,000. The increase in expenses in the DOA Fiscal Services category resulted from salary increases for individuals assisting the CHRB. The increase in expenses for Management Consultants is a result of additional responsibilities for one of the scientific reviewers.

Commonwealth Health Research CHRB [CHRB]
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Commonwealth Health Research Board (CHRB) Members

Cynda A. Johnson, M.D., M.B.A., Chair
Robert W. Downs, Jr., M.D., Vice Chair
Robert W. Downs, Jr., M.D.
Thomas W. Eppes, Jr., M.D.
Julia Spicer

Commonwealth Health Research Board (CHRB) Administrator

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