Commonwealth Health Research Board

2011/2012 Annual Report

Message from the Chairman

The Commonwealth Health Research Board (CHRB) was established in 1997 by the Virginia General Assembly using funds provided from the conversion of Trigon from a mutual company to a stock company. The Board provides grant funding for creative and innovative research projects that have scientific merit and hold promise for maximizing human health benefits for citizens of the Commonwealth of Virginia. The Board awards grants for traditional medical and biomedical research as well as research related to health services and the delivery of healthcare.

Since its inception, the CHRB has made 141 grant awards totaling $10.7 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 total project funds amount to $15.2 million for health research in Virginia.

Grants have been awarded to institutions of higher education and other organizations across the Commonwealth to include: Children's Hospital of The King's Daughters, Eastern Virginia Medical School, George Mason University, Radford University, University of Virginia, and Virginia Commonwealth University.

Grants have been awarded for research on a wide variety of important health conditions effecting thousands of Virginias, including: support for studying new approaches for treating breast cancer; developing improved HIV therapy; examining a potential new anti-cancer drug; exploring new treatment of multi-drug resistant bacteria; identifying the progression of breast pre-cancer to invasive malignancies; La Crosse virus; Autism Spectrum Disorders; renal injury in newborn infants; schizophrenia; sepsis; and diabetes.

The CHRB encourages collaborative research efforts and gives priority to those research efforts where Board support can be leveraged to foster contributions from other entities. CHRB grant recipients have leveraged approximately $20.5 million in additional private and federal grant funds to further their research studies. In addition, 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.

We are proud of the accomplishments of the CHRB and our grant recipients as we work towards a healthier future for all Virginians. As Chairman, I am pleased to present the 2011/2012 Annual Report.

Robert S. Call, M.D., Chairman
Commonwealth Health Research Board

Total Funding for all grant awards in FY 2011/2012

Including second year funding for 6 FY 2010/2011 grant awards

Principal Investigator	Submitting Institution/ Organization	CHRB Grant Award $	Recipient Matching $	Total Project Funds	Grant Title
Justin R. Anderson, Ph.D.	Radford University	$63,522	$22,785	$86,307	Characterization of La Crosse virus receptors in mosquito tissues
John Harrington, M.D.	Children's Hospital of The King's Daughters	$100,000	$45,861	$145,861	Treatment of Behavior Disorders among School-Aged Children with Autism Spectrum Disorders (ASD)
Molly Hughes, M.D., Ph.D.	University of Virginia	$100,000	$33,000	$133,000	Development of Novel Antimicrobial Agents for Multi-Drug Resistant bacterial Pathogens
Kylene Kehn-Hall, Ph.D.	George Mason University	$100,000	$49,070	$149,070	BTK induction by HIV: implications for therapeutics
Mary Jayne Kennedy, Pharm.D.	Virginia Commonwealth University	$98,122	$32,380	$130,502	Evaluation of mitochondrial gene sequence variants as biomarkers of aminoglycoside-induced renal injury in newborn infants
Frank Lattanzio, Ph.D.	Eastern Virginia Medical School	$100,000	$33,000	$133,000	Development of a well Tolerated, anti-angiogenic agent to treat drug resistant cancers
Masoud Manjili, Ph.D.	Virginia Commonwealth University	$100,000	$33,000	$133,000	Sequential common gamma chain cytokines can expand tumor antigen-reactive T cells that are resistant to cancer-associated immune suppression & generate long-lasting memory responses against HER02/neu
Aylin Rizki, Ph.D.	Virginia Commonwealth University	$100,000	$33,000	$133,000	The role of MRE11/RAD50/NBS1 in ER/PR/HER2 Negative Breast Pre-Cancer Progression
Jennifer Stewart, Ph.D.	Virginia Commonwealth University	$100,000	$33,000	$133,000	Generation of Mice Deficient in Vesicular Monoamine Transporter-1: Potential Links to Schizophrenia
Claretta J. Sullivan, Ph.D.	Eastern Virginia Medical School	$100,000	$49,116	$149,116	Atomic force microscopy in sepsis research: a new look at bacterial membrane vesicles
Arthur Weltman, Ph.D.	University of Virginia	$100,000	$33,000	$133,000	Effects of exercise intensity on postprandial glucose disposal and endothelial function in prediabetic adults
		$1,061,644	**$397,212**	**$1,458,856**	

"To promote and protect the health of the citizens of the Commonwealth through human health research."

Introduction

Legislation in 1997, Virginia Code § 23-278, created the Commonwealth Health Research Board as an independent body to provide financial support, in the form of grants, donations, or other assistance, for research efforts that have the potential of maximizing human health benefits for the citizens of the Commonwealth. Research efforts eligible for support by the Board shall 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.

This initiative of the General Assembly and the Governor used the proceeds from the sale of Trigon stock to create the framework and fiscal resources for a research grant program. The funds result from the stock and cash distributed to the Commonwealth of Virginia pursuant to the conversion of Blue Cross and Blue Shield from a mutual insurance company to a stock corporation. Income from the funds is used to make grants.

Virginia Code § 51.1-124.36 provides for the investment of assets of the Commonwealth Health Research Fund. The Board shall have the full power to invest, reinvest, and manage the assets of the Commonwealth Health Research Fund and maintain a separate accounting for the assets of the Commonwealth Health Research Fund. Commonwealth Health Research Fund assets are invested by the Virginia Retirement System.

Assets of the Commonwealth Health Research Fund are pooled with the $54.6 billion Virginia Retirement System [VRS] investment fund. The estimated value of the Fund as of June 30, 2011 was $28.8 million. The current asset allocation for the VRS investment fund reflects **54% equity, 24% fixed income, and 22% alternative assets**.

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 or since inception, whichever is shorter; on a one-year delayed basis, net of any administrative fee assessed pursuant to subsection E of Virginia Code § 51.1-124.36, may be expended in a calendar year for any purpose permitted by this chapter.

Funds available for 2011 Grant Awards		**FINAL**
Calendar Year		Market Value as of 12/31/xx
Jan. 1 - Dec. 31, 2005	Year 1	$28,637,870
Jan. 1 - Dec. 31, 2006	Year 2	$31,189,661
Jan. 1 - Dec. 31, 2007	Year 3	$32,807,479
Jan. 1 - Dec. 31, 2008	Year 4	$22,749,283
Jan. 1 - Dec. 31, 2009	Year 5	$25,803,429
Total		$141,187,722
Average Market Value		$28,237,544
Funds available for 2011 grants based on 4.4% of the average market value		$1,242,452
Less Administrative Expenses:		
Less Operating Expenses		$100,000
Less VRS Administrative Fees		$2,600
Total Administrative Expenses		$102,600
Funds Available for 2011 grants less estimated expenses:		$1,139,852

Methodology:
The valuation date for market values will be 12/31/XX of each year.
Each annual calculation will be made based on the previous five calendar years, with a one year delay.

Source: CHRF Market Values and VRS Administrative Fees: VRS

CHRB by the Numbers

CHRB Grant Awards: Disease/Research Areas Cumulative FY 2011/2012

Disease/Research Area	*Awards*	*In Dollars*
Aging and Diseases of the Aging	5	$410,675
Behaviorial Disorders	5	$642,589
Bacterial and Viral Diseases and Treatments	18	$2,222,388
Cancer and Cancer Treatment	22	$2,091,157
Cartilage and Bone	5	$576,078
Cardiovascular Disease	9	$927,399
Diabetes	8	$880,685
Drug Metabolism and Drug Addiction	3	$209,250
Eye and Ear Diseases	3	$478,925
Gastrointestinal Diseases	2	$179,494
Health Services Research	3	$181,126
Hematology	4	$120,983
Kidney Disease	3	$340,927
Lung Disease	3	$284,083
Metabolism	5	$320,683
Neurological Disorders	1	$70,238
Women's Health	5	$505,531
Psychiatric Diseases	1	$200,000
Wound Healing	1	$76,373
Other	0	$0
Total	106	$10,718,584

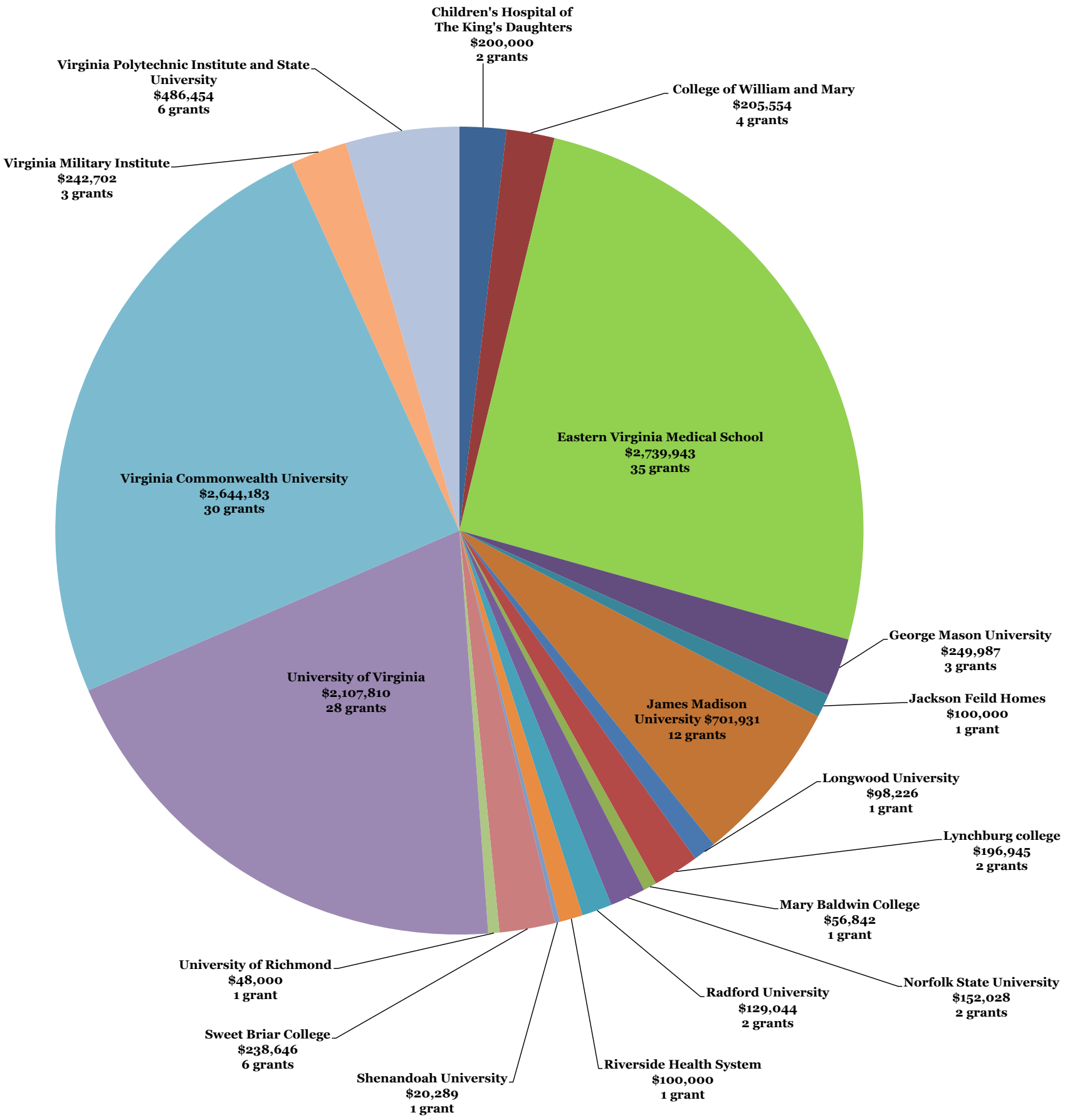
Excludes second year funding to avoid duplication.

Commonwealth Health Research Board Grant Awards Life to Date

updated July 2011

Grant Year	Number of Grant Awards	New CHRB Grant Awards	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
Cumulative Total	**141**	**106**	**35**	**$10,718,584**	**$4,571,251**	**$15,289,835**

CHRB Grant Funding to Date



Grant Award Abstracts

Justin R. Anderson, Ph.D.
Radford University
Characterization of La Crosse virus receptors in mosquito tissues
[second year of a two-year grant awarded in FY 2010/2011]

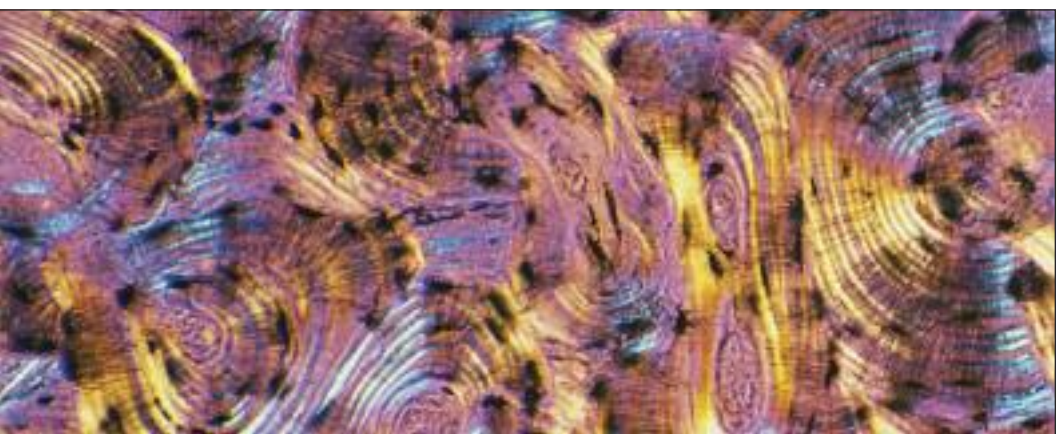
Project Summary: La Crosse virus is transmitted by mosquitoes and causes a potentially severe encephalitis, primarily in children; Virginia has reported 17 cases in the past decade. This project has two main goals: to isolate and characterize the receptor(s) the virus uses to establish an infection of the mosquito host, and to identify genetic differences in the receptor between mosquitoes that can become infected and those that cannot. We will isolate the receptor protein and sequence the gene coding for the receptor in two transmitting mosquitoes. We will then isolate the same gene from non-transmitting mosquitoes to characterize genetic mutations responsible for virus binding. Our results will lead to the development of new methods to prevent transmission of La Crosse and other viruses, either through vaccine development or by genetically modifying the mosquito host. This is a collaborative effort between researchers at Radford University and Virginia Tech.

John Harrington, M.D.
Children's Hospital of The King's Daughters [CHKD]
Treatment of Behavior Disorders among School-Aged Children with Autism Spectrum Disorders [ASD]
[second year of a two-year grant awarded in FY 2010/2011]

Project Summary: This study will evaluate the efficacy of Parent-Child Interaction Therapy (PCIT) among school-aged children (5-12 years old) with ASD and behavior problems. Research demonstrates that this family-centered-behavior therapy for disruptive behavior disorders significantly improves the child's behavior by changing the child-parent interaction, and the results generalize to the school environment. Due to the prevalence of behavior problems among children with ASD, novel treatments are needed to improve quality of life and academic success. We will evaluate the effectiveness of PCIT in reducing disruptive behavior and improving compliance during parent child interactions based on observed disruptive behavior during parent child interactions, parent- and teacher-reported disruptive behavior, and parent stress. Both Child and Parent-level outcomes will be examined at the pretest, during treatment, posttest, and 3 month follow-up. Findings will provide preliminary evidence to support a larger program of research into the treatment of behavioral problems among children with ASD.

Molly Hughes, M.D., Ph.D.
University of Virginia
Development of Novel Antimicrobial Agents for Multi-Drug Resistant Bacterial Pathogens

Project Summary: Since 1996, there has been a dramatic and alarming increase in the incidence of multi-drug resistant (MDR) Gram-negative bacteria, such as *Klebsiella pneumoniae*, causing human infections such as bloodstream infections and pneumonias. Multi-drug resistance among Gram-negative bacteria denotes resistance to three or more major classes of antibiotics. This increase in MDR Gram-negative bacteria has been recognized throughout the world and within the United States, including the Commonwealth of Virginia. Given the exceedingly few to no therapeutic options currently available, new strategies are urgently needed to fight these bacterial pathogens. We have been studying chemokines, which are proteins produced by cells of the human immune system in response to infections. Certain chemokines have demonstrated antibacterial activity against both Gram-negative bacteria (*Escherichia coli*) and Gram–positive bacteria (*Listeria monocytogenes*). Given our experience working with the chemokines, we propose to study and develop these chemokines as novel antimicrobial agents against MDR Gram-negative bacterial pathogens.



Kylene Kehn-Hall, Ph.D.
George Mason University
BTK induction by HIV: Implications for Therapeutics

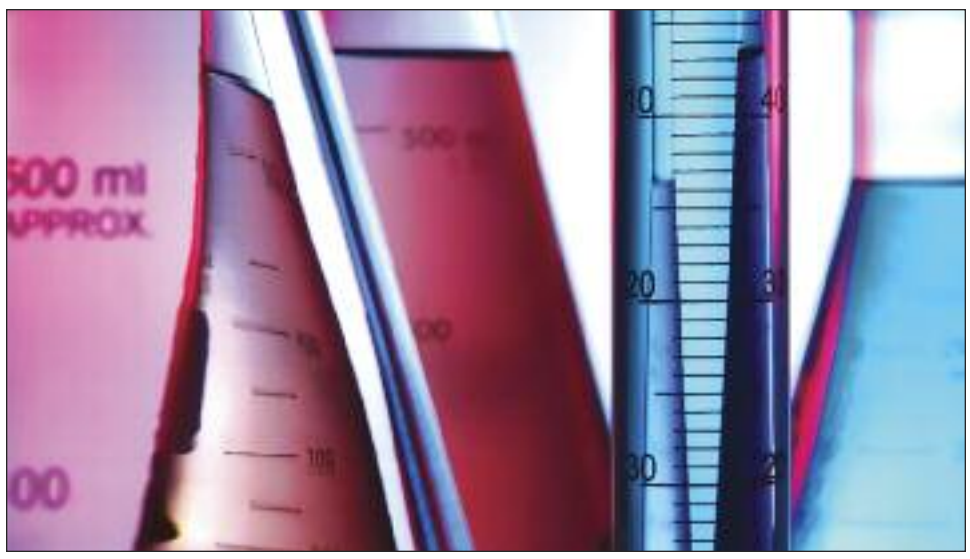
Project Summary: HIV-1 is the cause of the Acquired Immunodeficiency Syndrome (AIDS), a destructive disease of the immune system. Worldwide estimates of individuals infected with HIV-1 are 40 million and increasing. The 2008 estimate indicated that there are over 20,000 people living with HIV/AIDS in Virginia. Breakthroughs in treatment have been able to delay the onset of AIDS. The existence of a latent reservoir means that the virus can never truly be eliminated. In addition, current therapies for HIV-1 (HAART) can promote resistant strains of the virus. Therefore, there is a critical need for new targets for HIV therapy, which will not develop resistance. Therapeutics targeted against non-essential host proteins hold great promise to limit resistance. Our research is aimed at understanding the therapeutic potential of targeting Bruton's Tyrosine Kinase (BTK) in HIV-1 infected cells. Studying BTK could potentially lead to new treatment options for HIV/AIDS.

Mary Jayne Kennedy, Pharm.D.
Virginia Commonwealth University
Evaluation of mitochondrial gene sequence variants as biomarkers of aminoglycoside-induced renal injury in newborn infants
[second year of a two-year grant awarded in FY 2010/2011]

Project Summary: Aminoglycoside (AG) antibiotics are commonly used to treat infections in newborns. Despite their effectiveness, AGs can have harmful effects on the kidney. Approximately 7% of AG-treated infants develop kidney damage. This damage may affect kidney development and cause permanent structural/functional changes especially in premature infants whose kidneys continue developing after birth. Given the potential consequences, it is important to identify infants predisposed to injury before treatment is started so that alternate antibiotics can be used. Screening tools, however, are currently unavailable. Genetics are important in determining susceptibility to AG-induced hearing loss and it is possible that genetics may also influence susceptibility to AG-induced kidney injury. Therefore, the objective of this proposal is to investigate associations between genetics and AG-induced kidney damage. Ultimately, we may be able to reduce the number of AG-treated patients (adult and pediatric) who develop injury and improve the risk:benefit ratio of antibiotic treatment in Commonwealth citizens.

Frank Lattanzio, Ph.D.
Eastern Virginia Medical School
Development of a well tolerated, anti-angiogenic agent to treat drug resistant cancers

Project Summary: Cancer, in its many forms, is one of the two leading killers of all adult Virginians. For a solid tumor to survive, it must establish a network of functional blood vessels (angiogenesis). Halting this angiogenesis would control the progression of the disease. A number of agents directly or indirectly can stop angiogenesis, but all to date are non-specific and cause systemic toxicity and/or have limited efficacy. We have found an ophthalmological agent that specifically halts abnormal blood vessel growth without side effects in several ocular disease animal models and has the potential to serve as an anti-cancer drug that targets the tumor's blood vessels with minimal systemic toxicity, with a specific ability to treat tubulin-drug resistant tumors. We propose to evaluate this agent's *in vitro* and *in vivo* characteristics in treating cancer. In addition, the agent may also serve as a biomarker to detect the presence of tumor-related blood vessels.



Masoud Manjili, Ph.D.
Virginia Commonwealth University
Sequential common gamma chain cytokines can expand tumor antigen-reactive T cells that are resistant to cancer-associated immune suppression & generate long-lasting memory responses against HER02/neu

Project Summary: Biological therapy for breast cancer by means of lymphocytes has had striking success against melanoma, but it has had only limited efficacy against breast cancer. This has been because of two main obstacles: 1) breast cancer increases a type of cells called myeloid-derived suppressor cells (MDSC) that suppress lymphocytes against the tumors; 2) even if MDSC are eliminated by other therapies, lymphocytes that are being used for the treatment cannot generate long-lasting memory against cancers. We have recently developed a protocol for growing lymphocytes in the culture such that they become resistant to immune suppressor cells and at the same time generate long-lasting memory against breast cancer. This treatment protocol was 100% successful in animal models. Such striking observation prompted us to test the efficacy of this protocol on the blood of breast cancer patients outside of patients' body before initiating a phase I/II clinical trial in breast cancer patients.

Aylin Rizki, Ph.D.
Virginia Commonwealth University
The role of MRE11/RAD50/NBS1 in ER/PR/HER2 Negative Breast Pre-Cancer Progression

Project Summary: Breast pre-cancers become life-threatening when they recur as invasive cancers that can spread to essential organs such as bone, lung, and brain. 10 – 30% of patients with pre-cancers progress and develop invasive cancers. Currently, our ability to predict which pre-cancers will progress is very limited. Here we propose to study the role that the MRE11/RAD50/NBS1 (MRN) complex plays in this progression. The project is based on our previous observations suggesting that MRN suppresses invasion in an estrogen receptor (ER)/progesterone receptor (PR)/Human Epidermal growth factor Receptor 2 (HER2) negative subset of breast cancers in addition to its well-known roles in genome stability. We will study the functional relationship between the MRN complex and ER/PR/HER2 in pre-invasive to invasion transition, and determine how well the expression of these proteins correlate with risk of pre-cancer to invasive cancer progression.

Jennifer Stewart, Ph.D.
Virginia Commonwealth University
Generation of Mice Deficient in Vesicular Monoamine Transporter-1: Potential Links to Schizophrenia
[second year of a two-year grant awarded in FY 2010/2011]

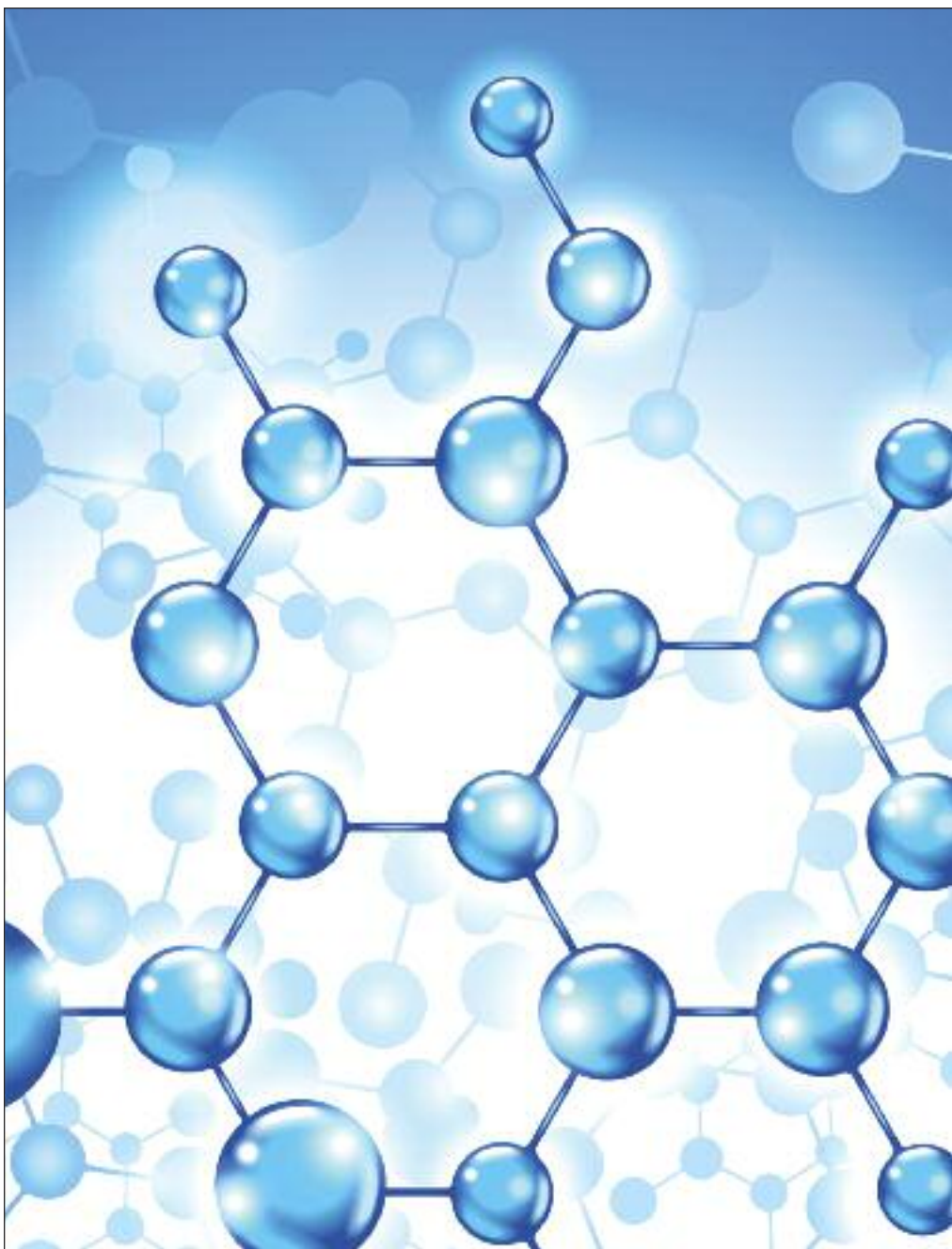
Project Summary: Schizophrenia is a disabling, chronic psychiatric disorder that is challenging to manage and costly. Although schizophrenia manifests in adults, it is thought to originate during early neural development. The human gene coding for vesicular monoamine transporter-1 (VMAT-1) recently advanced to the #2 position on the Schizophrenia Gene Database list of the most strongly associated genes linked to schizophrenia; however, the role of VMAT-1 gene mutations in schizophrenia is not known. Preliminary work has confirmed VMAT-1 gene expression in the brains of mice, indicating the mouse is a valid model for VMAT1 studies. The aims of the present study are to determine (1) both behavioral and physiological effects of VMAT-1 gene knock-out (VMAT-1 deficiency) in mice and (2) effects of specific human VMAT-1 gene mutations on VMAT-1 transport activity in cultured cells. These studies represent an important first step in elucidating the role of VMAT-1 in schizophrenia.

Claretta J. Sullivan, Ph.D.
Eastern Virginia Medical School
Atomic force microscopy in sepsis research: A new look at bacterial membrane vesicles
[second year of a two-year grant awarded in FY 2010/2011]

Project Summary: Lipopolysaccharide (LPS), a molecule on the surface of bacteria, triggers the physiologic response that leads to sepsis. It is generally assumed that because LPS is attached to the bacteria, eliminating the bacteria will also eliminate the LPS. Recent reports that gram-negative bacteria produce membrane vesicles (MVs) ranging from 50-250nm in diameter which contain LPS raises questions about their role in disease. MVs are too small to detect in most filter-based diagnostic assays. Since they do not have the ability to divide, they are also not detectable in culture-based assays. Atomic force microscopy is emerging as an important tool in microbiology for high resolution imaging and nanomanipulation. The study of bacterial membrane vesicles is an opportunity to apply the technique in sepsis research for the first time. We propose novel experiments to investigate vesiculation as it occurs in individual bacteria and also to assess the impact of MVs on endothelial cells.

Arthur Weltman, Ph.D.
University of Virginia
Effects of exercise intensity on postprandial glucose disposal and endothelial function in pre-diabetic adults
[second year of a two-year grant awarded in FY 2010/2011]

Project Summary: Pre-diabetes affects 57 million U.S. adults and is associated with increased risk of cardiovascular disease. Pre-diabetics frequently experience exacerbated glycemic responses to a meal (postprandial hyperglycemia; PPH). High sustained blood glucose levels from a meal result in damaging free radical production, inflammation, and impairments in blood vessel function and for these reasons PPH has been linked to atherosclerosis. Aerobic exercise performed prior to a meal represents a viable and cost-effective approach to reducing the impact of PPH. Our lab has preliminary data to show that exercise, particularly high intensity exercise, results in lower blood glucose levels and improved blood vessel function in the post-exercise period. This study will examine the effects of acute exercise at varying intensity prior to a meal on blood glucose control and blood vessel function in pre-diabetics. The results of this study will help develop clinical exercise guidelines specific to this population.



Evaluation Highlights

Comments are provided from Principal Investigators concerning their research and their success in obtaining additional grant funds from federal or private foundation organizations as a result of initial CHRB Grant support. These represent a sampling of recent responses to our evaluation surveys.

Mary Baldwin College, 2010 CHRB Grant Award to Anne Allison, Ph.D., The Role of Arf6 in Directing Intracellular Traffic in Breast Cancer.

"I would like to thank CHRB for funding my research early in my career. This support launched my research at Mary Baldwin College. Not only have I been productive in terms of publishing, but I have also trained five undergraduate students. Two of these students are now in doctoral programs, one in the Department of Cell Biology at the University of Virginia and the other in the Department of Biomedical Engineering at Dartmouth. A third student who is currently a junior at Mary Baldwin College was accepted to and attended Princeton's Undergraduate Research Program last summer. I am extremely proud of how these young women are becoming proficient young scientists who will lead the next generation of life science research."

Sweet Briar College , 2002 CHRB Grant Award to John J. Beck, Ph.D., Syntheses and Structure-Activity Relationship Studies of Aromatic Side-Chain (z)-Ligustilide Derivatives: A Natural Product from Ligusticum Species.

"Funds from the CHRB supported research that provided positive results of an initial investigation in to a line of antibacterial compounds. These positive results provided evidence for a new line of antibacterial compounds. These new compounds will be the subject of a grant proposal to the NSF."

As a result of the CHRB grant award, Dr. Beck was awarded a National Science (NSF) grant award in the amount of $254,066 for the period September 2002 to September 2005.

Virginia Commonwealth University, 2004 CHRB Grant Award to Jeffrey Dupree, Ph.D., The role of Oligodendrocytes in neuronal survival.

"My experience with the CHRB was extremely positive. When I received funding, I was a junior faculty member attempting to establish a research program. As any new investigator will confirm, it is very difficult to get started in this career. Most federal agencies require substantial preliminary data to support a good idea. For an investigator just getting started, good ideas are more abundant than data. The CHRB provided me with the opportunity to test hypotheses that federal agencies were leery of funding without substantial data indicating that the hypothesis was correct. As evidenced by both the subsequent funding and publication records, some of the ideas have panned out but without the support of the CHRB, these hypotheses would have never been tested. I am extremely indebted to the CHRB and greatly appreciate the willingness of the members of the Board to support my early research efforts and I am convinced that their willingness to support my research played a pivot role in the establishment and continued growth of my laboratory."

As a result of the CHRB grant award, Dr. Dupree was awarded the following grants: Virginia Center on Aging [$30,000]; Jeffress Memorial Trust Fund [$45,000]; National Institute of Health [$298,000]; and the European Leukodystrophy Association [$35,000].

Eastern Virginia Medical School, 2005 CHRB Grant Award to Yuliya Dobrydneva, Ph.D., Thrombosis in Women undergoing Tamoxifen chemoprevention therapy.
"CHRB funding allowed me to understand the molecular mechanism of action of tamoxifen in human platelets in vitro. Based on these data I am submitting a grant to the American Cancer Society which will be clinical study of tamoxifen effect in breast cancer patients. CHRB allowed my research to progress form basic science to clinic."

As a result of the CHRB Grant Award, Dr. Dobrydneva was awarded a 4-year grant from the American Heart Association in the amount of $260,000.

Eastern Virginia Medical School, 2006 CHRB Grant Award to Diane M. Duffy, Ph.D., Aspirin, Eggs and Pregnancy: A New Method of Birth Control.

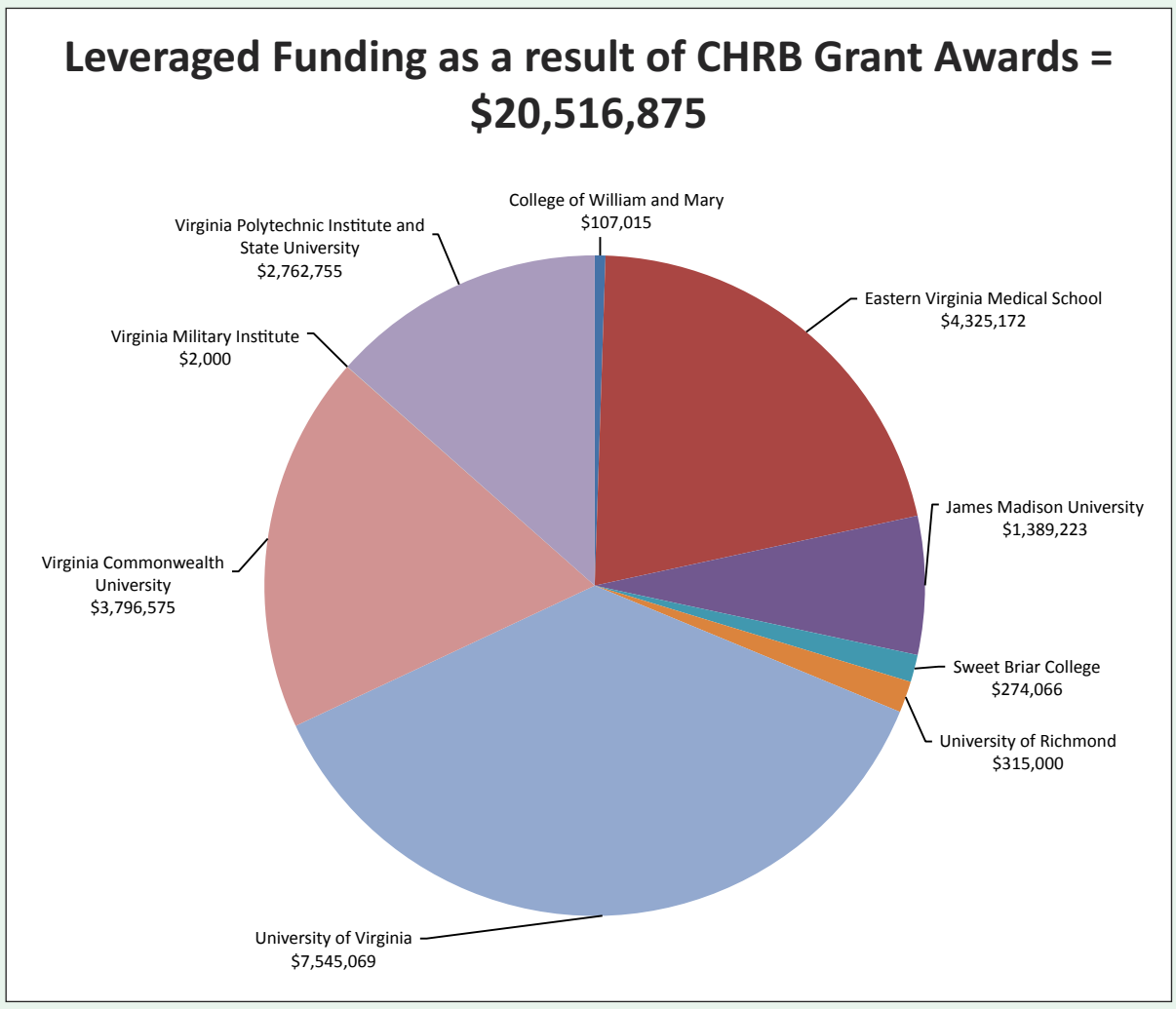
"I continue to be grateful for the support provided by CHRB. This funding allowed my laboratory to develop technologies and generate key preliminary data that yielded several publications and significantly strengthened grant applications which were ultimately funded by the NIH and CONRAD."

As a result of the CHRB Grant Award, Dr. Duffy was awarded a grant from NICHD in the amount of $1,401,278 and another grant from CONRAD/CICCR in the amount of $308,894.

University of Richmond, 2006 CHRB Grant Award to Michael C. Leopold, Ph.D., Crown Ether Modified Nanoparticle Films as Metal Ion Sensing Materials

"CHRB has been absolutely instrumental to the success of the Leopold Research Lab at the University of Richmond. In today's ultra-competitive funding environment, federal agencies like NSF and NIH are placing a premium on the principal investigators establishing the viability of proposed research projects. Funding opportunities like CHRB allow principal investigators to accomplish this task by providing funds for significant preliminary results and/or considerable fundamental development that is necessary for larger, long-term research goals and initiatives. In the full range of the research and development endeavor, CHRB funding provides researchers the critical ability to present a more developed, more strategic research proposal to federal agencies and to illustrate a research group's commitment to managing and moving projects forward toward significant goals and outcomes."

As a result of the CHRB Grant Award, Dr. Leopold was awarded a grant from the National Science Foundation in the amount of $255,000 and another grant award from the Camille & Henry Dreyfus Foundation – Henry Dreyfus Teacher Scholar Award, in the amount of $60,000.



James Madison University, 2008 CHRB Grant Award to Robert McKown, Ph.D., Development of Novel Diagnostics and Treatments for Ocular Diseases.

"Support from CHRB has enabled the development of an immunodiagnostic assay for human tear lacritin and advanced lacritin into preclinical animal studies for the treatment of ocular diseases with support from an NIH STTR Phase I grant. The lacritin research consortium includes scientists from JMU, the University of Virginia, Eastern Virginia Medical School, and EyeRx, Research, Inc. in Norfolk, VA. Undergraduate students participate in this research and present their work at scientific conferences and in peer reviewed publications."

As a result of the CHRB Grant Award, Dr. McKown was awarded a grant from NIH STTR in the amount of $128,842 and another grant award from the U.S. Army Medical Research and Materiel Command in the amount of $140,246.

James Madison University, 2009 CHRB Grant Award to Mark L. Gabriele, Ph.D., Establishing Complex Auditory Circuits: Molecular Mechanisms and Functional Implications for Treating the Hearing Impaired.

"In addition to providing the funds to aid in my development as an independent investigator, the project awarded by the CHRB provided numerous undergraduates in my laboratory hands-on experience in basic science research methods. One of these students, Matt Wallace, graduated in May 2012 and has been working on my recently awarded NIH grant as an Outstanding NIH Scholar for 2012.2013. He is currently interviewing at various medical schools and plans to matriculate in the coming year and continue his interests in research as an M.D. In addition to being a published author as an undergraduate in a top-tier neuroanatomy journal, Matt also received the Most Outstanding Phi Beta Kappa Honors Thesis for all of JMU in 2012, as well as being recognized for the Most Outstanding Undergraduate Presentation at this past years Central Virginia Society for Neuroscience Meeting."

As a result of the CHRB Grant Award, Dr. Gabriele was awarded a grant from NIH (NIDCD) in the amount of $320,135.

University of Virginia, 2008 CHRB Grant Award to John Hossack, Ph.D., Ultrasound-triggered release of rapamycin from microbubbles to treat in-stent restenosis.

"CHRB funding was very useful in allowing us to collect preliminary data for NIH funding. NIH funding is now extremely competitive. Since grant application reviewers are famously conservative and wanting to see proof of feasibility, viable preliminary data is essential. CHRB's emphasis on multi-insitutional collaboration (primarily within Virginia) caused us to explore new research partnerships across external institutions – VPI (VT) and VCU in our instance."

As a result of the CHRB Grant Award, Dr. Hossack was awarded a grant from NIH NHLBI in the amount of $1,250,000.

Grant Eligibility, Process, Requirements and Criterea

Entities Eligible for CHRB Grant Funding

State-supported Virginia institutions of higher education,

Agencies of the Commonwealth of Virginia

Nonprofit organizations exempt from income taxation pursuant to § 501 c (3) of the Internal Revenue Code located in the Commonwealth of Virginia.

CHRB Grant Process

Commonwealth Health Research Board (CHRB) grant guidelines are updated annually and posted to the CHRB website at www.chrb.org by July 1st of each year. The grant guidelines are designed to help individuals determine if the research project or initiative for which financial support is sought is a good match with the CHRB purposes and criteria. The CHRB website provides a description of past and current CHRB grant awards and grant abstracts.

As part of the CHRB grants application process, there are three steps that take place in the review process. More details regarding the required information as part of the submission of a concept paper or a full proposal to the CHRB can be found at www.chrb.org under the heading of CHRB Grant Guidelines.

Step One:
Submission of a Concept Paper

Normally due October 1st
All applicants seeking CHRB grant support must first submit a concept paper. For institutions of higher education, all concept papers must be submitted to the Applicant Institution's Office of Sponsored Programs or Office of Grants Research, for institutional review and approval, prior to being submitted to the CHRB. Concept papers [excluding the cover page] must be no longer than five typewritten, double spaced pages. In general, concept papers will provide information on the problem, need or opportunity that the project will address and the anticipated results or impact of the project. The concept papers will include project costs and the amount of funding the applicant is seeking from the CHRB as well as a timeframe for conducting the research. Each concept paper undergoes scientific and technical merit review.

Step Two:
Submission of a Full Proposal

Normally due February 1st
The CHRB will ask applicants, whose concept papers appear to meet its purposes and goals and which are judged to merit further consideration, to submit full proposals. Only applicants whom the Board has invited to develop a full proposal may submit a full proposal to the Board. The full proposal [excluding the cover page] must be no longer than 12 typewritten, double-spaced pages. The full proposal is expected to be scientifically based on the concept paper, allowing for a more detailed description of the goals, outcomes, methods and procedures. As in Step One, each full proposal receives in-depth review.

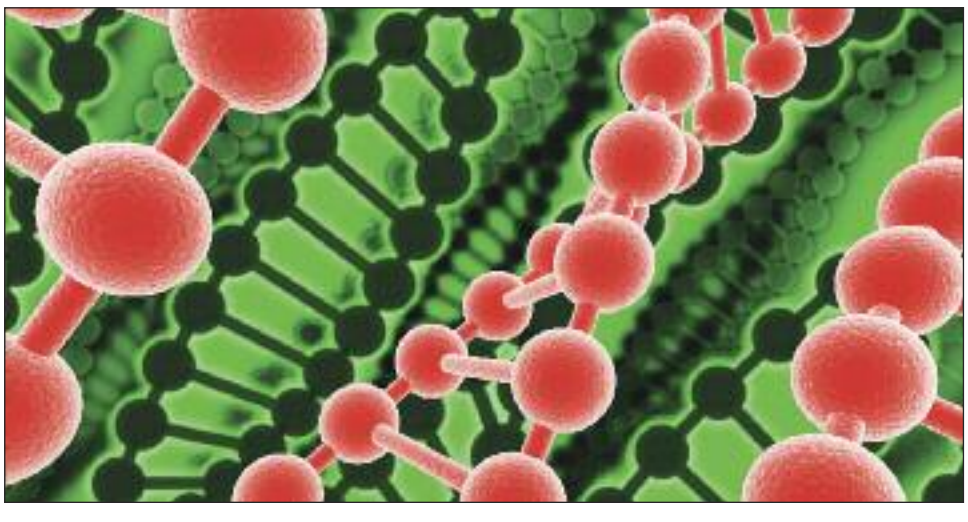
Step Three: Presentation of the Full Proposal to the CHRB

Mid-May

The Board invites finalists, from among individuals who submitted a full proposal, and were judged to be most competitive, to make a presentation to the Board. Presentations, including questions and responses, should take no longer than 15 minutes. The presentation should elaborate on the information contained in the concept paper and full proposal.

Grant Award

After the presentations to the CHRB are completed, the Board will make decisions regarding grant awards. Conditions for grant acceptance include a grant agreement between the Principal Investigator and the grantee institution and the CHRB. Each grantee must sign a Grant Agreement with the CHRB that delineates the terms and specific objectives of the project. Specific grant reporting requirements and distribution of grant funds are specified in the individualized grant agreement.



Other CHRB Grant Requirements

Applicants may request funding to support projects over either a one-year or two-year period. The maximum amount of a one-year award is $100,000. The maximum amount for a two-year award is $200,000; however, no more than $100,000 will be provided in the either the first or second year. The number of one-year and two-year grant awards that the CHRB anticipates it will make, is dependent upon the amount of funds available and the number of requests received for each category.

The Grantee Institution must provide a minimum cash match from internal funds in the amount of 33% of the amount of CHRB funds requested. The grantee institution or organization can use indirect costs as part of or all of their matching funds.

The starting date for all CHRB-funded projects is July 1. The CHRB will not entertain a request for a later start date. If the applicant cannot initiate the project by July 1, the award will not be made.

The CHRB will accept no more than 15 applications from any one non-profit organization or institution of higher education per funding cycle. Individuals applying for funding may submit no more than one application per funding cycle.

Grantees are responsible for meeting federal, state, and local health and safety standards and for establishing and implementing necessary measures to minimize their employees' risk of injury or illness in activities related to CHRB grants. Grantees are further responsible for meeting all applicable federal, state, and local regulations, requirements, and standards related to the involvement of human subjects and vertebrate animals.

Applicants who are notified that they will present their full proposal to the Board, and who plan to conduct human subjects research or projects using animals, are strongly encouraged to begin the process of seeking Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC) approval in advance of a formal presentation to the CHRB in order to ensure that required approvals are received by June 15th of the first year. If required IRB or IACUC approvals have not been received and transmitted to CHRB by June 15th no award will be issued by CHRB.

CHRB Grant Scientific Review Criteria

The Commonwealth Health Research Board [CHRB or Board] was created by Virginia Code § 23-278 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 shall 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.

Concept Papers and Full Proposals are reviewed in accordance with the following general criteria:

Significance:
- Does the research address an important problem?
- If the aims of the application are achieved, how will scientific or other knowledge be advanced? What will be the impact of this research on the concepts, methods, or practices in the related field?

Approach:
- Are the conceptual framework, design, methods and analyses adequately developed, well integrated, and appropriate to the aims of the project? The Board supports both new research efforts and the expansion or continuation of existing research efforts.

Innovation:
- Does the project employ novel concepts, approaches or methods?
- Are the aims original and innovative?
- Does the project challenge existing paradigms or develop new methodologies or technologies?

Experience, Qualifications and Collaboration of Research Team:
- Does the Principal Investigator have the proper training, experience and appropriate percentage of time designated to direct and manage the project?
- Has the Principal Investigator conducted research related to this project?
- Is the research team qualified through training and experience to conduct this research?
- Will the initiative employ useful collaborative arrangements among two or more institutions of higher education or other research organizations?
- Has the Principal Investigator published any successfully-completed or ongoing research which relates to this proposal?

Unique Virginia Considerations and Leverage:
- What is the potential of maximizing human health benefits for Virginia citizens?
- Are there unique Virginia research resources or facilities to be utilized?
- How will funding provided by the CHRB be used to leverage additional support from other federal or private organizations? The Board gives priority to those research efforts for which CHRB support can be leveraged to foster contributions from federal agencies or other entities.
- Will there be opportunities for undergraduate students at small colleges to participate in the research?

Commonwealth Health Research Board
P.O. Box 1971 [Mailing]
101 N. 14th Street, 2nd Floor [Delivery]
Richmond, Virginia 23218-1971

www.chrb.org

"To promote and protect the health of the citizens of the Commonwealth through human health research."

Commonwealth Health Research Board Members

Commonwealth Health Research Board
c/o Department of Accounts
P.O. Box 1971 [Mailing]
101 N. 14th Street, 2nd Floor [Delivery]
Richmond, Virginia 23218-1971
804.371.7799 Telephone
804.692.0222 Fax