Commonwealth Research Commercialization Fund

Advancing Technology and Economic Development in Virginia by Investing in Priority Research and Commercialization Activities

ANNUAL REPORT

July 1, 2019 – June 30, 2020

Submitted by the Fund Administrator:
Center for Innovative Technology
on behalf of the Virginia Innovation Partnership Authority

October 1, 2020

Table of Contents

Executive Summary

In accordance with Code of Virginia § 2.2-2233.1 G and 2.2-2221 and on behalf of the Virginia Innovation Partnership Authority (VIPA), the Center for Innovative Technology (CIT) respectfully submits this report regarding the performance of the Commonwealth Research Commercialization Fund (CRCF) in FY2020.

The CRCF, managed by CIT, accelerated innovation and drove economic development in the Commonwealth, while solving important state, national, and international problems through technology research, development, and commercialization. Between the program's inception in FY2012 and its sunset on June 30, 2020, nearly 380 projects around the Commonwealth totaling more than $30 million were approved for funding.

Economic outcomes reported in FY2020 by CRCF award recipients identified early returns on the Commonwealth's investment: approximately $136 million in follow-on monies to support further technology advancement, nearly $1.7 million in in-kind contributions, eight new companies formed, and approximately 49 products or services launched. In support of the Fund's goal to commercialize high-potential technologies, annual outcomes reported by awardees reflect the maturation and evolution of their organizations and technologies as they advance toward market entry. Outcomes are discussed below.

In FY2020, CIT offered one CRCF solicitation, which resulted in 30 awards totaling $2.48 million and leveraging the Commonwealth's investment with more than $13 million in matching funds. These projects, along with those in the CRCF portfolio, are being performed by companies, universities, and research organizations across the state and align with Virginia's key strategic technology priorities as outlined in the Commonwealth Research and Technology Strategic Roadmap (hereafter referred to as "the Roadmap"). The Roadmap, most recently published by the State Council of Higher Education for Virginia (SCHEV) in October 2019, identifies research areas worthy of economic development and institutional focus because of their promise of driving economic growth in Virginia.

The FY2020 CRCF program was supported by a $2.8 million General Fund appropriation. Funds available to award reflected CIT's administrative fee as well as monies from previous grants that had not been fully expended or had been declined.

Program Impact

CRCF awards sought to solve current and longstanding global challenges in industries such as life sciences, cybersecurity, advanced manufacturing, energy, and unmanned systems. CRCF has funded projects ranging from therapeutics for glioblastoma to transforming agricultural crop protection to

connected and autonomous vehicle solutions to optimizing wireless communications. Among the many outcomes reported during FY2020, at least one CRCF award recipient was acquired, four organizations reported Series A investment of more than $3 million and with one receiving $25 million, and several award recipients were positioned to pivot their CRCF-funded research to help address the COVID-19 pandemic. One organization reported that the National Institutes of Health (NIH) provided funding for two clinical trials, a Virginia university initiated a preclinical program for the development of a key peptide, and yet another award recipient reported that they submitted their first Investigational Device Exemption pre-submission packet. CRCF awardees also reported honors ranging from a National Science Foundation (NSF) CAREER award, to being selected as a Jefferson Science Fellow to the National Academies of Science, to receiving the Tibbetts Small Business and Distinguished Researcher awards. Lastly, an Eminent Researcher Recruitment project has had a crucial role in the establishment of a new Pharmaceutical Engineering PhD program for one Virginia university. CRCF projects have the potential to provide a profound and lasting benefit to citizens of the Commonwealth and to society at large by enhancing quality of life and economic development.

CRCF awards have, primarily, supported early-stage technology development, setting the technology on a commercialization path and making it attractive for further investment and/or licensing. Milestones along this often multi-year path include clinical trials; FDA and other regulatory approvals; investment from federal, private, or other sources; beta product releases; and pilot programs. Fund investments have resulted in companies created, expanded, or acquired; products launched; revenue generated; intellectual property developed and licensed; key personnel recruited; and other outcomes beneficial to Virginia and beyond.

FY2020 reports[1] submitted by award recipients demonstrate exciting returns on investment for the Commonwealth, and aggregate figures are provided below.

Investments			
Follow-on Funding	In-Kind Contributions	Undisclosed Source	Additional Leverage
$135,586,789	$1,659,148	$666,000	$594,769

In FY2020, CRCF awardees reported more than $138 million investment in CRCF-funded technologies, including follow-on funding, in-kind contributions, and additional leverage. Follow-on funding is comprised of $72 million in federal grants and $47 million received through capital raises, along with numerous sources of private funding; an additional $666 thousand was received from undisclosed sources. For CRCF awardees, in-kind support typically consists of waived salaries or equipment donations and additional leverage represents monies that awardees reported, beyond their original match commitment.

[1] FY2020 reports were received between August 16, 2019 and August 15, 2020. Reports provided outcomes for the awardee's previous 12 months, or for final reports, for the duration of the project.

Growth and Expansion				
Revenue	New Jobs	Jobs Retained	New Companies Formed	Enhancements and/or Expansions
$16,643,667	168	162	8	29

Three CRCF awardees reported revenue figures of more than $2 million each. One CRCF award recipient was acquired by a large organization. Along with increasing a physical footprint, a number of award recipients reported enhancements to their facility and/or equipment.

Products or Services		
Newly Commercialized	Anticipated for Release within 12 Months	Under Development
49	90	13

In total, 139 products or services were reported as introduced to the market in FY2020 or planned for release over the next year. Thirteen technologies were reported as under development, including at the beta, demo, or prototype stages, as well as in pilot programs.

Intellectual Property	
Patents Granted	Patents Pending
57	157

CRCF award recipients reported intellectual property creation, including U.S., international, PCT, and provisional patents. Their reports also cited several patents under development, invention disclosures, trade secrets, and copyrights. Additionally, several organizations are actively pursuing licensing agreements for their technology.

Each year CIT assesses and refines CRCF reportable criteria to best reflect the types of economic outcomes being demonstrated in the Commonwealth. For example, CIT began tracking follow-on investment and jobs in FY2015; since that time, awardees have reported more than $593 million in follow-on funding, more than $20 million of in-kind support, more than $105 million in sales and revenue, and more than 1,800 jobs created or retained.

Program Overview

Since the inception of the CRCF program in FY2012, 1,062 applications were submitted from all nine GO Virginia regions and, from these submissions, 378[2] projects were offered funding. These awards total more than $30 million and are being leveraged with more than $85 million in matching funds, including federal awards.

[2] 378 projects were offered funding since CRCF's inception; 20 awards have been declined.

CRCF projects with the potential to positively impact Virginia's technology future have covered the following technology sectors: advanced manufacturing, aerospace, communications, cybersecurity, energy, environment, information technology – including data analytics, life sciences, modeling and simulation, nuclear physics, transportation, and unmanned systems. Per legislative direction, CRCF projects advance technology sectors identified in the version of the Roadmap current when a given solicitation was announced.

CIT leveraged its programs to facilitate company creation and growth. In relation to other CIT programs, CRCF was part of a pipeline, working closely, for instance, with the Federal Funding Assistance Program (FFAP), the GAP family of funds, and the Virginia Unmanned Systems Center. CRCF also complemented other funding programs in the Commonwealth, such as the Virginia Research Investment Fund (VRIF), the Virginia Catalyst (formerly known as VBHRC, the Virginia Biosciences Health Research Corporation), the Commonwealth Health Research Board (CHRB), and the Tobacco Region Revitalization Commission.

FY2020 Solicitation

One solicitation was offered in FY2020 that included five programs: Commercialization, Eminent Researcher Recruitment, Matching Funds, SBIR Matching Funds, and STTR Matching Funds. Applications were invited from academia, federal labs, other nonprofit research institutions, university research consortia, and the private sector.

- **Commercialization Program**
  The Commercialization Program supported validation and commercialization activities for high-potential technologies in the proof-of-concept, prototype, or minimum viable product (MVP) development phases that had a reasonable probability of enhancing the Commonwealth's national and global competitiveness. The maximum award amount increased from $50,000 to $75,000.

- **Eminent Researcher Recruitment Program**
  The Eminent Research Recruitment Program supported public colleges and universities seeking to acquire or enhance research superiority in qualified technologies through the recruitment of a top scholar to its faculty. Research commercialization and collaboration with the private sector are important activities for the hired researcher. The maximum award amount was $250,000.

- **Matching Funds Program**
  The Matching Funds Program enabled public and private higher education institutions, federal labs and other nonprofit research institutions in Virginia, and university research consortia that included Virginia college and university member institutions to leverage federal, private, or other funds designated for the commercialization of high-potential technologies and economic benefit to Virginia. The maximum award amount increased from $100,000 to $150,000.

- **SBIR and STTR Matching Funds Programs**
  The SBIR and STTR Matching Funds Programs accelerated high-potential technology development and commercialization efforts by Virginia-based businesses that had recently won a Phase I and/or Phase II Small Business Innovative Research (SBIR) or Small Business Technology Transfer (STTR) award. The maximum award amount increased from $50,000 to $75,000.

Projects were invited under five technology sectors: clean energy, cybersecurity, data analytics, life sciences, and unmanned systems.

In FY2020, CIT received 183 eligible Letters of Intent (LOIs) in response to the Request for Proposals (RFP). Of these, 61 LOIs were approved for application and 49 applications were ultimately received from 44 discrete organizations and 49 discrete principal investigators. Applicants requested approximately $4.5 million and these requests spanned all programs and industry sectors and seven of the nine GO Virginia regions. Thirty awards were announced for $2.48 million, leveraging the Commonwealth's investment with more than $13 million in matching funds. Awarded projects also represented all industry sectors, four of the five programs, and six of the nine GO Virginia regions.

A brief overview of each project announced for award in FY2020 is provided in Appendix A.

Program Administration

Administrative activities in FY2020 included overseeing the solicitation, outreach, and award management for projects funded in FY2012 through FY2019. The fee for Fund management was $370,582.

As Fund Administrator and with the support of the Research and Technology Investment Advisory Committee (RTIAC)[3] and the Office of the Secretary of Commerce and Trade, CIT developed the approach for the FY2020 solicitation, including updated program guidelines, an enhanced application and review process, and continued use of an online grants management system, CyberGrants, to facilitate application submission and reporting. CIT led a multi-step review process, starting at the LOI stage. LOIs were reviewed by CIT for administrative compliance and then underwent a business and technology-oriented evaluation by external reviewers. Reviewers included members of the RTIAC as well as investment professionals and other subject matter experts. Applicants whose LOIs were most highly rated were invited to submit a proposal. Once all proposals were received, CIT performed an internal compliance review to determine those applications that would advance to examination by subject matter experts. These experts, including individuals from industry, academia, government, and the venture capital community, evaluated and rated proposals. Again, those applications that scored highest

[3] The RTIAC is a legislatively-established body comprised of representatives drawn from higher education, economic development, research institutes, venture capital firms, and technology corporations.

advanced to and were reviewed and ranked by two additional members of the RTIAC. Based on the assessments of the RTIAC, projects were recommended to the CIT Board of Directors for funding; the Board made final award decisions, after which awards were announced.

The list of FY2020 RTIAC members is included as Appendix C.

CIT maintains information on the Fund, including awards and current solicitations, on its website, www.cit.org. In FY2020, press releases announced the request for proposals and, subsequently, award recipients. Outreach and communications also included social media, email announcements, webinars, and speaking engagements. Outreach was enhanced by additional communication networks, including CIT's GAP team, FFAP, and the Virginia Unmanned Systems Center; Virginia's regional technology councils; individual colleges and universities and other higher education institutions; the Virginia Biotechnology Association (VABIO), regional Association for Unmanned Vehicle Systems International (AUVSI) chapters, accelerators, investment groups and other organizations that provide support to entrepreneurs, and economic professionals throughout Virginia.

Following the Governor's June 2020 press release announcing awards, CIT invited award recipients to prepare and issue their own press releases. Several awardees pursued the opportunity and CIT facilitated providing a quote from then-President and CEO, Ed Albrigo. In addition, CIT's Marketing and Communications team engaged in outreach to local media outlets and monitored for stories related to the recent awards. There was coverage from industry press across the state, as well coverage beyond Virginia.

Also as Fund Administrator, CIT managed awards announced in prior years and produced the FY2019 Annual Report. This included assessing project performance on an ongoing basis. Additionally, CIT provided support to external organizations, state agencies, and researchers from academia, industry, and other members of the technology community that desired information about the Fund and future solicitations. Throughout the year, CIT provided oversight to ensure compliance with the CRCF guidelines and other requirements.

Preparations for FY2021

In 2020 the General Assembly and Administration created the Virginia Innovation Partnership Authority, or VIPA. Established by Code of Virginia § 2.2-2351, VIPA brings consolidated and significant strategy, funding, and oversight for innovation commercialization and entrepreneur support under one entity. The CRCF program was sunset on June 30, 2020 and transitioned, along with the previously mentioned VRIF program, to the newly created Commonwealth Commercialization Fund (CCF) per Virginia Code § 2.2-2359. The FY2020 Annual Report of the Virginia Research Investment Committee (VRIC), which addresses the VRIF, will be submitted separately by SCHEV.

APPENDIX A: FY2020 Award Details

Award Recipient	GO Virginia Region	Project Title	Project Description	Period of Performance	Principal Investigator	CRCF Award	Match
COMMERCIALIZATION PROGRAM							
Commonwealth Trading Partners, Inc.	Region 7 – Northern Virginia	*Cloud Search Tool for Export Commodity Classification*	CTP's automated export classification tool will integrate neural networks and deep learning algorithms to improve efficiency and accuracy in determining the export classification of defense articles and dual-use commodities, assisting U.S. exporters with their compliance requirements under the EAR and ITAR.	07/01/2020 – 04/30/2021	Mr. Tom Fergus	$74,705	$75,029
Cowden Technologies, LLC	Region 2 – Roanoke / New River / Lynchburg	*A Smart Docking Station for Drones*	Cowden Technologies is developing a battery charging and data retrieval docking platform that can be installed on a drone and provide autonomous guidance control while docking, undocking, and securing the drone to the platform. The technology will enable drones to operate remotely without human intervention.	06/15/2020 – 06/14/2021	Mr. Mickey Cowden	$75,000	$109,000
Eksdyne Inc.	Region 2 – Roanoke / New River / Lynchburg	*A Magnetohydro-dynamic Actuator System for Robotics*	Eksdyne is developing "Flux" actuators – silent, configurable, flexible devices responsible for controlling systems with no moving parts, designed for advanced robotic motion.	06/15/2020 – 06/15/2021	Mr. Joshua Eckstein	$74,915	$96,098
GATACA LLC	Region 2 – Roanoke / New River / Lynchburg	*GAT for NGS: A Bioinformatics Tool for Hepatitis B Virus Quasispecies – Incorporating Machine Learning*	CRCF funds will be used to automate and commercialize GATACA's bioinformatics product powered by artificial intelligence: GAT/MLv1.0, a novel tool that profiles dangerous mutant strains from molecular viral populations that perpetuate viral infections. GATACA will focus first on the Hepatitis B virus.	06/15/2020 – 02/15/2021	Dr. Johanna Craig	$75,000	$76,186
Lumin	Region 9 – Greater Charlottesville	*Promoting Residential Solar PV Development Through Curtailment of Excess Production Off-Grid*	Lumin is proposing to develop a technology capable of automatically keeping solar PV production within a safe threshold for charging energy storage systems during grid outages. This technology will allow solar PV systems to be sized according to on-grid household needs, without being limited in size by off-grid considerations.	07/01/2020 – 12/31/2020	Mr. Michael Hibshman	$64,917	$64,972

Award Recipient	GO Virginia Region	Project Title	Project Description	Period of Performance	Principal Investigator	CRCF Award	Match
Meru Biotechnologies, LLC	Region 4 – Greater Richmond	*Development of the Minimum Viable Product for a Free Solution Biomolecular Characterization Device*	Meru Biotechnologies is developing cancer biomarkers and opioid detection test kits for their novel analytical instrument. This technology will provide lower cost and rapid access to lifesaving data.	06/15/2020 – 05/31/2021	Mr. Daniel Rodenhaver	$75,000	$75,000
Onclave Networks, Inc	Region 7 – Northern Virginia	*Secure IoT: A Zero-Trust Platform for Elimination of OT Attack Surface*	Onclave Networks is developing a technology that will enable industries to protect 5G and legacy systems without rebuilding the network infrastructure. Specifically, CRCF funding will allow the team to ensure secure integrations, address industry integrations, and explore how the technology might drive digitalization across industries given the sizable projected IoT market.	06/15/2020 – 06/14/2021	Mr. James Taylor	$75,000	$405,352
Organizing4Innovation	Region 7 – Northern Virginia	*Using Team-Learning and Teamwork-Quality Indicators as Objective Performance Assessments to Vet Early-Stage Innovation Teams*	Organizing4Innovation is developing a predictive analytics model with the potential to provide teams with unique insight into their behavior, allowing them to motivate members to become better innovators and team players, helping them to understand what they do well and where they fall short, and giving them actionable feedback that will help the team perform better.	07/01/2020 – 07/01/2021	Dr. Floor Blindenbach	$50,450	$51,595
SCOUT Inc.	Region 7 – Northern Virginia	*Demonstrating Small Satellite Technology to Enable Satellite Health Inspections in Geostationary Orbit*	SCOUT is developing an on-site satellite inspection technology that will enable small satellites to conduct autonomous rendezvous, approach, and observation of spacecraft at resolutions much greater than 100x beyond what exists today. CRCF funding will allow SCOUT to develop the core of its technology, SCOUT-Vision: a high-capability small satellite sensor package capable of inspecting objects kilometers away at <1 cm/px resolution.	06/15/2020 – 12/15/2020	Mr. Sergio Gallucci	$74,816	$74,816
Sentinel Robotic Solutions, LLC	Region 5 – Hampton Roads	*Sentinel Aerium: American-Made Class I UAS with Disruptive Flight Endurance Technology*	Sentinel Robotic Solutions is developing the Sentinel Aerium, a market-disruptive, American-made, vertical takeoff and landing, ruggedized, multi-use, small unmanned aerial system with flight times 3x greater than sUAS currently available that will significantly expand the uses for small UASs.	07/01/2020 – 03/31/2021	Mr. John Robinson	$75,000	$75,000

Award Recipient	GO Virginia Region	Project Title	Project Description	Period of Performance	Principal Investigator	CRCF Award	Match
Service Robotics & Technologies	Region 7 – Northern Virginia	*A Software Command Center for Scheduling and Optimizing Robots and Humans in Smart Buildings*	SRT is proposing to build a global command center for smart device management, strengthening the central controller component of their patent, while filling an unmet market need for a stand-alone software system that can schedule device maintenance and human tasking, prioritized by importance for completion and by location within the facility.	07/01/2020 – 06/30/2021	Dr. Gregory Scott	$75,000	$82,506
Techulon Inc	Region 2 – Roanoke / New River / Lynchburg	*PPNA-Based Antimicrobial Therapeutics Against Multi-Drug-Resistant Pseudomonas and Acinetobacter*	Techulon is developing a platform technology that makes novel therapeutics accessible to selectively target and kill four groups of pathogens: MRSA, *Pseudomonas aeruginosa, Klebsiella pneumonia, and Acinetobacter baumannii*, as well as *Borelia* spp. and *Candida* spp. With CRCF funding, the team will focus on developing a novel peptide-peptide nucleic acids (PPNA) targeting *A.baumannii*.	07/01/2020 – 12/31/2020	Dr. Nrusingh Mohapatra	$75,000	$999,974*
					TOTAL:	**$864,803**	**$2,185,528**
MATCHING FUNDS PROGRAM							
Old Dominion University	Region 5 – Hampton Roads	*Blockchain-Empowered Cyber-Resilient IoT Security Solution*	ODU is seeking to integrate software development and commercialization activities for Bloxure, a networked device identity management platform. These efforts will significantly enhance the maturity of Bloxure and ensure commercial viability and implementation with Sentara Healthcare's operational environment at multiple sites.	06/15/2020 – 06/14/2022	Dr. Sachin Shetty	$150,000	$150,000
University of Virginia	Region 9 – Greater Charlottesville	*Machine Learning Technology for Prediction of Future Glucose Fluctuations to Enable a New Generation of Adaptive Glucose Control in Diabetes*	Following a decade of development, UVA has developed and commercialized a system for closed-loop glucose control in Type 1 diabetes. CRCF funding will allow the team to further enhance the system by developing a new technology that can predict the next-day glycemic variability for an individual and, thereby, enable a new generation of adaptive glucose control in diabetes with markedly enhanced safety and efficacy.	07/01/2020 – 06/30/2021	Dr. Leon Farhi	$137,453	$150,000
University of Virginia	Region 9 – Greater Charlottesville	*Novel Automated System to Measure Plant Health*	Accurate and timely monitoring of plant health status has a wide range of applications in many areas of the Commonwealth and beyond, for example, precision agriculture, forestry, and environmental monitoring.	07/1/2020 – 6/30/2022	Dr. Xi Yang	$150,000	$150,000

Award Recipient	GO Virginia Region	Project Title	Project Description	Period of Performance	Principal Investigator	CRCF Award	Match
			UVA is developing a technology to monitor plant health automatically or by using an unmanned autonomous vehicle.				
Virginia Commonwealth University	Region 4 – Greater Richmond	*Development of Novel Heterogeneous Cross-Coupling Catalysts for Pharmaceutical Applications*	VCU is developing a unique catalyst system that can be used in pharmaceutical applications to produce drug active ingredients. These catalysts are important because they are not only extremely reactive and efficient, but also avoid contamination of the drugs with heavy metals.	07/01/2020 – 06/30/2021	Dr. Frank Gupton	$150,000	$150,000
					TOTAL:	**$587,453**	**$600,000**
SBIR MATCHING FUNDS PROGRAM							
Agrology	Region 7 – Northern Virginia	*Commercializing a Precision Agricultural System for Irrigation, Fertilizer, and Spray Scheduling*	Agrology is building a precision agriculture system to guide crop farmers to maximum profit and yield with minimal fertilizer, pest and disease sprays, and irrigation applications.	06/15/2020 – 12/15/2020	Mr. Tyler Locke	$75,000	$750,000*
Azimuth1	Region 7 – Northern Virginia	*EnviMetric: Geospatial Statistical Tools for Environmental Screening of Commercial Real Estate Sales*	Azimuth1 is developing a tool that will show the most likely extent of groundwater contamination by generating statistical estimates of down-gradient distances of contaminant travel to be applied during Phase I Environmental Site Assessments for commercial real estate transactions.	06/15/2020 – 06/15/2021	Mr. Jason Dalton	$75,000	$995,000*
Babylon Micro-Farms Inc.	Region 9 – Greater Charlottesville	*Designing a Disruptive Platform for Hydroponic Vertical Farming: Addressing Challenges in Effective Urban Farming and the Elimination of Food Deserts*	With CRCF funding, Babylon Micro-Farms is proposing a means to effectively and efficiently automate systems of hydroponics. By integrating machine learning models analyzing plant growth and harvest yield, the Babylon doser will generate feedback modulating growth conditions and fully automate hydroponic operation.	06/15/2020 – 11/30/2020	Mr. Graham Smith	$75,000	$223,102*
BEM Controls, LLC	Region 7 – Northern Virginia	*WiseMrkt: A Platform for Transactive Energy and Demand Response Applications*	BEM Controls will develop a number of algorithms to help building owners improve energy savings and utilities and better prioritize assets to be optimized during demand response events.	07/01/2020 – 03/31/2021	Mr. Rasheq Rahman	$75,000	$1,049,914*

Award Recipient	GO Virginia Region	Project Title	Project Description	Period of Performance	Principal Investigator	CRCF Award	Match
Burnshire Hydroelectric LLC	Region 8 – Shenandoah Valley	*Inverter Controlled Multigenerator*	With CRCF funding, Burnshire Hydroelectric will test whether adding an additional generator to a hydropower drive shaft will add range of operation, particularly during low river flow periods when typical generators cease to operate.	07/20/2020 – 12/11/2020	Dr. Robert Harvey	$74,981	$899,235*
Federal Foundry LLC	Region 7 – Northern Virginia	*Structured and Unstructured HR Analytics to Support Hiring, Staffing, and Partnership Decision Making*	CRCF funds will enable Federal Foundry to develop an analytic tool to help government contracting companies search for and evaluate potential partners.	06/15/2020 – 06/14/2021	Mr. Geoffrey Orazem	$73,140	$753,298*
ICBiome, Inc.	Region 7 – Northern Virginia	*A WGS-Based Genomics Platform for Early Identification of MRSA Transmission in ICU Settings*	Through federal and prior CRCF funding, ICBiome has developed novel cloud technologies for genomics-based pathogen diagnostics. Through this latest award, the team seeks to develop a visual demo and webinar that showcases the success of their SBIR Phase 1 MRSA project, as well as a pilot evaluation of their genomics surveillance product at a Children's Hospital.	06/15/2020 – 12/15/2020	Dr. Srini Iyer	$75,000	$218,843*
KeViRx, Inc	Region 9 – Greater Charlottesville	*Development of Novel Small Molecule Inhibitors of the Oncogenic Protein Tyrosine Phosphatase PTP4A3 for the Treatment of Human Cancers*	CRCF funds will allow KeViRx to further develop a newly discovered class of small molecules that inhibit the activity of one of the most potent cancer-causing protein tyrosine phosphatases, which is highly expressed in ~50% of human malignancies, including drug-resistant ovarian cancer and acute myelogenous leukemia.	06/15/2020 – 06/14/2021	Dr. John Lazo	$75,000	$309,033*
Micro Harmonics Corporation	Region 2 – Roanoke / New River / Lynchburg	*Cryogenic Isolators for High-Frequency Ship Radar and Drone Inspection Systems*	The design and production of compact cryogenic isolators for use in drone-mounted threat detection and structural inspection systems, as well as shipboard radar systems operating at 26-40 GHz, is the focus of this Micro Harmonics project. In addition, CRCF funding will support innovative new methods of producing key ceramic isolator parts by using additive manufacturing techniques.	06/15/2020 – 06/14/2021	Ms. Diane Kees	$75,000	$766,532*

Award Recipient	GO Virginia Region	Project Title	Project Description	Period of Performance	Principal Investigator	CRCF Award	Match
ReAlta Life Sciences	Region 5 – Hampton Roads	*Peptide Inhibitor of Complement C1 (PIC1) as a Treatment for Hypoxic Ischemic Encephalopathy (HIE)*	This CRCF project will advance the commercial readiness of the PIC1 technology currently under development by ReAlta Life Sciences, as well as establish quality assurance programs for manufacturing and supply of GMP-grade PIC1 and on-site evaluation of the Phase I human testing site at which first-in-human clinical trials will be conducted.	06/15/2020 – 06/14/2021	Dr. Neel Krishna	$59,446	$1,497,741*
Tympanogen, Inc.	Region 4 – Greater Richmond	*Preparation of a 510(k) Application for FDA Clearance of a Gel Patch for Nonsurgical Eardrum Repair*	During this project, Tympanogen will prepare the 510(k) application for a novel nonsurgical eardrum repair patch and submit it to the FDA.	06/15/2020 – 12/31/2020	Dr. Elaine Horn-Ranney	$75,000	$1,479,163*
WynnVision LLC	Region 4 – Greater Richmond	*Preventing Ventilator-Associated Infections*	In the U.S., more than 300,000 patients each year receive mechanical ventilation with a high risk for complications and poor outcomes, including death. To address this unmet need, WynnVision will use CRCF funding to prevent or greatly reduce such infections by using an economical treatment for silicone endotracheal tubes that kills disease-causing pathogens while being nontoxic to human tissue.	07/01/2020 – 06/30/2021	Dr. Olga Zolotarskaya	$75,000	$708,940*
					TOTAL:	**$882,567**	**$9,725,801**
STTR MATCHING FUNDS PROGRAM							
AgroSpheres, Inc.	Region 9 – Greater Charlottesville	*AgroSpheres Enabled RNAi Delivery for Agriculture*	AgroSpheres is developing an RNAi bioinsecticide to control the invasive Fall Armyworm, one of the most common causes of damaged turfgrass.	06/15/2020 – 02/01/2021	Mr. Ameer Shakeel	$75,000	$300,000*
Li Industries, Inc.	Region 2 – Roanoke / New River / Lynchburg	*Effective Materials Separation for Low-Cost Lithium Ion Battery Direct Recycling*	Li Industries is developing a direct battery recycling process that increases the sustainability of the lithium-ion battery lifecycle by isolating and regenerating cathode materials of end-of-life lithium-ion batteries for reuse. This CRCF project aims at improving upon and developing new methods of separating out the cathode materials to achieve higher purity recycled materials.	06/15/2020 – 06/14/2021	Mr. Nolan Schmidt	$75,000	$225,000*
					TOTAL:	**$150,000**	**$525,000**
					TOTAL CRCF FY2020 AWARDS:	**$2,484,823**	**$13,036,329**

APPENDIX B: FY2020 Funding Totals

PROGRAM	FY2020 AWARD COUNT	FY2020 AWARD TOTAL	FY2020 MATCH TOTAL
Commercialization Program	12	$864,803	$2,185,528
Matching Funds Program	4	$587,453	$600,000
Eminent Researcher Recruitment Program	0	$0	$0
SBIR Matching Funds Program*	12	$882,567	$9,725,801
STTR Matching Funds Program*	2	$150,000	$525,000
ALL PROGRAMS	**30**	**$2,484,823**	**$13,036,329**

* Matching funds provided toward the CRCF include federal awards and may include additional awardee-contributed match as well

APPENDIX C: RTIAC Members

In FY2020, the following individuals were members of the Research and Technology Investment Advisory Committee (RTIAC), the group responsible for making CRCF award recommendations to the CIT Board of Directors.

- **Steve Clinton,** former Vice President and COO – Sebesta, Inc. (*retired*)
- **Morris Foster**, Vice President for Research – Old Dominion University
- **Cheryl Giggetts,** Principal Consultant – CTA Consultants, LLC
- **Keith Holland,** Associate Vice Provost for Research, Scholarship and Creative Endeavors – James Madison University
- **Dennis Manos**, Vice Provost for Research and Graduate/Professional Studies – College of William and Mary
- **Steven Moret**, President and CEO – Virginia Economic Development Partnership
- **Srirama Rao**, Vice President for Research and Innovation – Virginia Commonwealth University
- **Venkat Rao,** Program Director for Health Market Strategy – Parsons
- **Scott Tolleson,** Partner – Promethean Investments, LLP
- **Craig Wanke**, Senior Principal Engineer – The MITRE Corporation