

Andy Hill Cancer Research Endowment

ANNUAL REPORT

Fiscal Year 2020 (July 1, 2019–June 30, 2020)



Andy Hill CARE Fund

Washington's Cancer Research Endowment

Promoting Cancer Research to Improve the Quality of Life for the People of Washington

The Andy Hill Cancer Research Endowment (CARE) Fund, created by the state legislature in 2015, is a bold public-private partnership that incentivizes additional investment by securing private and non-state matching funds to maximize the state's investment in cancer research. The CARE Fund aims to improve health outcomes by advancing transformational research in the prevention and treatment of cancer.





Letter from our Board Chair Frederick Appelbaum, MD

Executive Vice President and Deputy Director, Fred Hutchinson Cancer Research Center
Metcalf Family/Frederick Appelbaum Endowed Chair in Cancer Research
Professor, Division of Medical Oncology, University of Washington School of Medicine

Science does not stand still. And neither will we.

Last year, the CARE Fund launched the next phase of our activities through the adoption of the [CARE Fund FY20–21 Strategic Plan](#). As these plans were created, little did anyone anticipate what would lay ahead for public health in Washington, and around the globe, in 2020.

The first confirmed case of COVID-19 in the United States was announced by the state of Washington in late January 2020. On February 29, Governor Jay Inslee declared a state of emergency after the first U.S. death from COVID-19 occurred here.

As the state mobilized its response to the pandemic, the CARE Fund also immediately acted. The board and staff rapidly funded *COVID-19 Response Grants* to researchers in our state seeking answers to questions at the intersection of COVID-19 and cancer. How does COVID-19 affect the growth of cancer? How does being treated for cancer change the outcome of COVID-19 infection? How does the pandemic alter patient care and the conduct of clinical trials? What are the disproportionate impacts of the pandemic on specific populations of cancer patients?

Many talented scientists are seeking answers to these questions and more. Summarized in this report are this year's CARE Fund investments in cancer research, with a special emphasis on projects aimed at lessening the impact of COVID-19 on cancer patients. At the same time, we continue to support outstanding scientists conducting breakthrough research in all areas of cancer, with the goal of improving the health and well-being of our community.

Sincerely,

Frederick Appelbaum, MD | Chair, CARE Fund Board of Directors



The Year in Review

The CARE Fund Board of Directors is committed to investing in cancer research that produces statewide public benefit through targeted investments that will focus on populations bearing a disproportionate burden of disease, elevate high priority research areas, and develop innovative cancer research grant opportunities in a manner that best achieves statewide public benefit.

In accordance with the CARE Fund statute (Revised Code of Washington (RCW) 43.348.040(5)), the CARE Fund is pleased to issue this annual report to the public. The annual report sets forth the activities with respect to the Fund including the number and dollar amounts of grants ([page 6](#)); the grantees for the prior year ([page 6](#)); the Endowment's administrative expenses ([page 5](#)); an assessment of the availability of funding for cancer research, prevention and care from sources other than the Endowment ([page 5](#)); a summary of research, prevention, and care-related findings, including promising new areas for investment ([pages 2,3,7](#)); and a report on the benefits to Washington of its programs to date ([page 2](#)).

Invited speakers made presentations to the board regarding cancer disparities in Washington State and the emergence of vaping among youth and the national outbreak of e-cigarette, or vaping, product use-associated lung injury. These presentations and the COVID-19 pandemic set the stage for Distinguished Researchers and COVID-19 Response grantmaking and investments. Six new grants were awarded (five COVID-19 Response grants, and one Distinguished Researchers grant), two Breakthrough Research grants were awarded continued funding, and the Fund's program administrator engaged in a statewide COVID-19 and cancer data project.

Grant Awards

The Distinguished Researchers Grant Program has helped support recruitment and start-up packages for ten world-class cancer researchers in the state of Washington to date. The fourth cycle of the Distinguished Researchers Program aimed to address cancer disparities. Applicants' research plans were required to address a cancer disparity, such as cancers that disproportionately burden underserved populations in Washington State and unequal access to cancer care. A Distinguished Researchers grant was awarded to the University of Washington to support start-up funding for Dr. Yaw Nyame, a surgeon, researcher, and patient advocate who specializes in urologic oncology and general urology. Dr. Nyame's comprehensive research approach is likely to uniquely and effectively address the complexity of prostate cancer disparities. Conducting this level of research in the Washington State population has the potential to impact the state's public health needs. Furthermore, his research will promote a multidisciplinary approach, fostering the integration of prostate cancer disparities research across disciplines at the University of Washington.

The CARE Fund Board recognized that the COVID-19 pandemic was having a significant impact on cancer patients and survivors, and that access to cancer prevention and screening services would be limited or unavailable. To help address these issues and find solutions, the CARE Fund quickly created a COVID-19 Response Grant Program to support research that focuses on the effects of COVID-19 on outcomes, risks, access to cancer prevention or screening services, and well-being for cancer patients. Within 11 days of announcing the funding opportunity, 21 proposals, ranging from basic science to population-based research, were received. Five \$100,000 grants were awarded to implement research at the intersection of COVID-19 and cancer. Read more about the CARE Fund's COVID-19 response on [page 2](#).

COVID-19

CARE Fund Benefits to Washington

At a time when all Washingtonians are dealing with the impact of the COVID-19 pandemic, there are particular impacts for cancer patients and their families. This new virus is especially of concern for survivors and those undergoing treatment of cancer. It presents a new health concern that must be understood to continue to provide the best care for patients and their families. In response, the CARE Fund launched two new efforts to address the impact of the COVID-19 pandemic on cancer care.

COVID-19/Cancer Response Grant Awards

The CARE Fund invested \$500,000 for research grants at the intersection of COVID-19 and cancer. The CARE Fund is supporting research that can be immediately initiated and focuses on the impact of COVID-19 on outcomes, research, risks, or well-being for cancer patients. Washington State organizations, including companies, universities, research institutions, local health jurisdictions, tribal governments, and tribal entities were eligible to apply.

The CARE Fund received a strong response (21 applications totaling \$2.1 million in requested funds) from researchers across the state for the COVID-19/Cancer Research Response Grant opportunity. Proposed projects ranged from basic science research to population health research.

Five \$100,000 grants were awarded to the following institutions to implement research at the intersection of COVID-19 and cancer:

Bloodworks Northwest

(José López, MD; Dominic Chung, PhD)

“Development of Single-Chain Variable Fragment Antibodies to Block SARS-CoV-2 Infection”

University of Washington

(Brian Beliveau, PhD; Shreeram Akilesh, MD, PhD)

“A Scalable Platform for Multiplexed Detection of SARS-CoV-2 RNA and Protein in Human Tissues”

University of Washington

(Christine Queitsch, PhD; Richard James, PhD)

“Targeting of Interleukin 6 Signaling as a Key Pathway in Cancer and Severe COVID-19”

Washington State University

(Ofer Amram, PhD)

“Evaluating the Impact of Deferred Cancer Preventive Care in the Era of COVID-19”

Washington State University

(Patrik Johansson, MD, MPH)

“Impact of the COVID-19 Pandemic on the Well-Being of Rural and American Indian Cancer Patients in Washington State”

The CARE Fund is pleased to invest in this research at such a critical time, and will continue to share the ways that this research will impact Washington residents, particularly cancer patients and survivors.

COVID-19 and Cancer Data Project

The CARE Fund will engage with the Fred Hutchinson Cancer Research Center, MultiCare Institute for Research & Innovation, and the Community Cancer Fund to undertake a statewide data project to assess the impact of the COVID-19 pandemic on cancer care, with particular emphasis on low income groups and underrepresented minorities.

This project will be a collaboration between the Hutchinson Institute for Cancer Outcomes Research (HICOR), MultiCare, and the Community Cancer Fund. The collaboration will result in a rich statewide COVID-19 and Cancer Research Data Repository with information on care, outcomes, and experiences for cancer patients in Washington State during the COVID-19 pandemic to inform future cancer research.

Research Advancing Science

The CARE Fund is proud to support the recruitment and research of world-class cancer researchers in Washington. Four of these researchers are Dr. Mark Headley from the Fred Hutchinson Cancer Research Center, Dr. Wei Wei from the Institute for Systems Biology, Dr. André Lieber from the University of Washington, and Dr. Geoffrey Hill from the Fred Hutchinson Cancer Research Center.



MARK HEADLEY, PhD

Fred Hutchinson Cancer Research Center

Distinguished Researchers Grant

Dr. Mark Headley is an Assistant Professor in the Program in Immunology for the Clinical Research Division at Fred Hutchinson Cancer Research Center. Dr. Headley is primarily focused on studying tumor metastasis, the spread of cancer cells from a primary tumor to distant organs, and specializes in lung metastasis. As metastasis is the leading cause of death for most cancer patients, it is an area in which research advances and developments can have tremendous impact. He and his lab have developed cutting-edge tools to enable these studies and directly visualize tumor cells and immune cells in live lungs in real time.

Recently, Dr. Headley was involved in an exciting collaboration with Dr. Raphael Gottardo and Dr. Evan Newell (CARE Fund Distinguished Researcher Cycle 2 Grantee) to develop Infinity Flow, a free software designed to enhance single-cell analysis. This software will not only remove many of the pre-existing barriers in understanding disease systems, but also increase the productivity of many labs. Single-cell analysis allows scientists to better understand and analyze the immune system, which is intricate, complex, and dynamic. The tools that their team has developed will help identify cell types, and cell functions, and provide valuable insights about how the immune system interacts with cancer. They are hopeful that the Infinity Flow technique will act as a catalyst for cancer research around the world, as well as improve treatments and therapies for cancer patients.



WEI WEI, PhD

Institute for Systems Biology

Distinguished Researchers Grant

Dr. Wei Wei was recruited from the University of California, Los Angeles School of Medicine by the Institute for Systems Biology (ISB) in 2018. As a physical scientist by training, much of Dr. Wei's research focuses on how to understand and interpret the interactions among fundamental units, such as single cells, and apply that knowledge to a systems level. Dr. Wei's lab is developing and utilizing innovative single-cell tools and computational approaches in hopes of building a better platform to understand cancer systems biology and address significant questions in translational cancer research.

Recently, Dr. Wei, in collaboration with other ISB researchers, developed a new diagnostic method through single-cell analysis to predict the impact of standard therapies on lung cancer patients. Their single-cell metabolic assay is able to provide accurate information on how well patients will respond to standard treatments and therapies, such as chemotherapy. This information will serve as a valuable supplement for oncologists and help inform their clinical decision making to both efficiently and effectively provide the best treatment for patients. This development is particularly important for newly diagnosed patients who are not likely to respond well to chemotherapy, and may want to seek different treatment options that are better suited for them.

“Transforming lives worldwide is a proud hallmark of Washington’s thriving statewide cancer research ecosystem. We must continue to support and attract the world’s brightest scientists and most innovative companies.”

— Dr. Lisa Brown, Director, Washington State Department of Commerce



ANDRÉ LIEBER, MD, PhD

University of Washington

Breakthrough Research Grant

Dr. André Lieber is a physician-scientist with an interest in basic and applied adenovirus and stem cell research. One of his primary research focuses lies within understanding treatment resistance in cancer patients. His CARE-funded Breakthrough Research project seeks to overcome treatment resistance in ovarian cancer patients, which frequently occurs after an initial response to chemotherapy. Recurrent ovarian cancer is often resistant to treatment due to the poor penetration of chemotherapy drugs, which in many cases, is caused by a barrier of tight junctions formed by the tumor cells. Dr. Lieber’s lab has developed a small recombinant protein to open tight junctions and allow greater accessibility of chemotherapy molecules. His lab was able to completely eliminate the tumor when they tested their junction openers with chemotherapy drugs.

His lab will begin toxicology studies to determine the appropriate treatment dose and assess the safety of the protein therapy in combination with immunosuppression in preparation of a clinical trial. This work has been enhanced by a collaboration between investigators from several different research institutes and organizations within Washington State. Successful completion of their clinical studies could have a profound impact on many different cancer therapies.



GEOFFREY HILL, MD, FRACP, FRCPA

Fred Hutchinson Cancer Research Center

Distinguished Researchers Grant

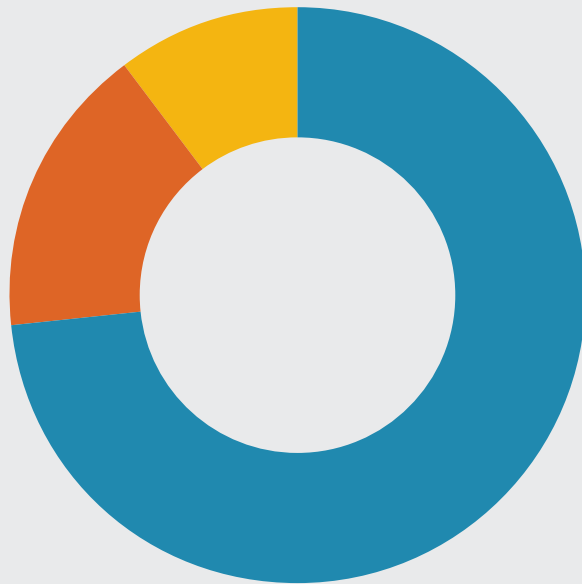
Dr. Geoffrey Hill is the director of Hematopoietic Stem Cell Transplantation at Fred Hutchinson Cancer Research Center and Seattle Cancer Care Alliance. Dr. Hill is an internationally recognized physician-scientist who was recruited from Australia and is currently leading groundbreaking studies on Graft-versus-Host Disease (GvHD).

Some blood diseases, including cancers such as leukemia, are treated using allogeneic stem cell transplants, in which healthy donor stem cells replace the diseased cells of a patient. A risk to this treatment is GvHD, in which donated stem cells or bone marrow see the healthy tissue of the body as foreign and attack it, which can be lethal.

Dr. Hill’s research lies primarily within using transplant models to better understand the signaling pathways that cause chronic GvHD, and translating these discoveries through new therapies to prevent and treat GvHD. For a long time, scientists were puzzled by the incidence of GvHD in the gut and how to prevent it. Upon the lab’s investigation in tracing the chemical pathway of the disease, Dr. Hill and his research colleague, senior scientist Dr. Motoko Koyama, discovered that the gut was not only the target of the disease, it was also responsible for initiating the disease. Currently, the lab is testing a drug that will block interleukin-12, a chemical signal, in the biome before transplantation to prevent GvHD in the gut.

Financial Summary (Unaudited) Fiscal Year 2020

July 1, 2019–June 30, 2020



■ New Grant Commitments

\$4,491,695 (73.5%)

■ Grants Paid

\$991,632 (16.2%)

■ Program Administration

\$631,536 (10.3%)

Total Commitments and Expenditures

\$6,114,863

The Washington State Legislature is authorized to appropriate up to \$10 million per year to the CARE Fund. From inception through FY20, the CARE Fund has received \$14 million in state appropriations. The supplemental budget passed by the Legislature and subsequently signed by the Governor included \$7.454 million to the CARE Fund for the 2019–2021 biennium. This amount includes State General Fund and projected vapor products tax revenue. In Fiscal Year 2020, \$140,752 was available in funding for cancer research from sources other than the endowment.

Through June 30, 2020, the CARE Fund has awarded 17 grants to Washington State organizations across three programs: Distinguished Researchers (10 awards), Breakthrough Research (2 awards), and COVID-19 Response (5 awards). CARE Fund grants are supporting research projects across a broad range of disciplines from developing technologies to detect cancer recurrence to reducing cancer risks associated with environmental exposures, as well as addressing cancer disparities in communities within Washington State.

The tables on [page 6](#) detail the CARE Fund grants awarded through Fiscal Year 2020.

Public Private Partnership July 1, 2016–June 30, 2020

56 Grant Applications Requested

\$146
Million

17

Grants Awarded

Non-State Dollars Matched Grant Awards Nearly

3:1

State Funding Received Since 2016

\$14
Million

CARE Fund Grants Awarded

Grants Awarded in FY2020			
Grantee	Date Awarded	Grant Program	Amount Awarded
Institute for Systems Biology (James Heath, PhD)	Feb 2020	Breakthrough Research (Yr 2)	\$3,000,000
University of Washington (André Lieber, MD, PhD)	Apr 2020	Breakthrough Research (Yr 2)	\$491,714
Bloodworks Northwest (José Lopez, MD ; Dominic Chung, PhD)	Jun 2020	COVID-19 Response	\$100,000
University of Washington (Brian Beliveau, PhD ; Shreeram Akilesh, MD, PhD)	Jun 2020	COVID-19 Response	\$100,000
University of Washington (Christine Queitsch, PhD ; Richard James, PhD)	Jun 2020	COVID-19 Response	\$100,000
Washington State University (Ofer Amram, PhD)	Jun 2020	COVID-19 Response	\$99,997
Washington State University (Patrik Johansson, MPH, PhD)	Jun 2020	COVID-19 Response	\$99,984
University of Washington (Yaw Nyame, MD, MBA)	Jun 2020	Distinguished Researchers	\$500,000
Total Awarded in FY2020:			\$4,491,695

Grants Awarded in FY2018–2019					
Grantee	Award Date	Grant Program	Amount Awarded	Amount Paid in FY2018-2019	Amount Paid in FY2020
Fred Hutchinson Cancer Research Center (Lucas Sullivan, PhD)	Apr 2019	Distinguished Researchers	\$500,000	--	\$100,000
Institute for Systems Biology (Wei Wei, PhD)	Apr 2019	Distinguished Researchers	\$500,000	--	\$100,000
Institute for Systems Biology (James Heath, PhD)	Dec 2019	Breakthrough Research (Yr 1)	\$750,000	--	\$740,492
University of Washington (André Lieber, MD, PhD)	Dec 2019	Breakthrough Research (Yr 1)	\$400,000	--	\$51,140
Fred Hutchinson Cancer Research Center (Geoffrey Hill, MD, FRACP, FRCPA)	Aug 2018	Distinguished Researchers	\$500,000	\$100,000	--
Fred Hutchinson Cancer Research Center (Thomas Kensler, PhD)	Aug 2018	Distinguished Researchers	\$500,000	\$100,000	--
Fred Hutchinson Cancer Research Center (Evan Newell, PhD)	Aug 2018	Distinguished Researchers	\$500,000	\$100,000	--
Fred Hutchinson Cancer Research Center (Heather Greenlee, ND, PhD, MPH)	Dec 2017	Distinguished Researchers	\$500,000	\$500,000	--
Fred Hutchinson Cancer Research Center (Mark Headley, PhD)	Dec 2017	Distinguished Researchers	\$500,000	\$500,000	--
Fred Hutchinson Cancer Research Center (Lev Silberstein, MD, PhD)	Dec 2017	Distinguished Researchers	\$500,000	\$500,000	--
Institute for Systems Biology (James Heath, PhD)	Dec 2017	Distinguished Researchers	\$500,000	\$500,000	--
Total:			\$5,650,000	\$2,300,000	\$991,632



Promising New Areas for Investment

The term *population health* has evolved through the decades, but more recently it is emerging as a field that encompasses everything from health outcomes to patterns of social determinants of health, and the policies and interventions that connect the two.

One of the CARE Fund's objectives is to optimize the use of public funds by giving priority to research utilizing the best science and technology with the greatest potential to improve health outcomes for Washingtonians. In order to do so, the CARE Fund is committed to investing in the growing health needs of populations disproportionately impacted by cancer.

According to the [National Cancer Institute](#), research areas that present opportunities for improving cancer-related public health include those that:

- Develop and test behavioral interventions that reduce cancer risk (such as smoking cessation, cancer screening, and cancer vaccination programs)
- Develop and test interventions that improve access to and delivery of cancer care
- Assess cancer risks associated with environmental exposures so as to inform regulatory decisions to limit such exposures
- Identify policies and programs that can make cancer care more efficient and less costly
- Develop better tools and study designs for conducting population-based studies
- Identify and test methods for more effectively disseminating cancer prevention, risk, screening, prognosis, and treatment information to specific population groups
- Test ways to meet the needs and challenges of a growing population of cancer survivors

A priority of the CARE Fund's strategic plan (FY2019–2021) is to meet a broader set of statewide needs for cancer research, including cancer prevention, treatment innovations, breakthroughs for cures, and survivorship.

Continued development of groundbreaking treatments and therapies to alleviate pain and suffering from cancer is critical. It is also imperative that these technologies and treatments are equitably available and delivered to communities across Washington State.

The CARE Fund will continue to tailor future funding opportunities that will address these needs and make targeted investments that focus on populations bearing a disproportionate burden of disease and elevate high priority research areas such as the impact of COVID-19 on cancer patients.

Responding to COVID-19

To immediately respond to the pandemic, this year the CARE Fund launched a statewide COVID-19/cancer data project and a COVID-19 response grant opportunity. The CARE Fund is now developing a Population Health Grant Program that aims to fill gaps in population-based research funding by supporting projects that have high potential to translate into interventions to address cancer disparities across the cancer control continuum.

Washington is home to some of the world's best cancer researchers, as well as some of the most innovative and influential technology and life sciences companies. The CARE Fund is honored to work with these dedicated individuals and organizations, and will continue supporting science and technology with the greatest potential to improve health outcomes for Washingtonians.

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Organizational affiliation is for identification purposes only.



Spokane-based Empire Health Foundation (EHF) serves as Program Administrator for the CARE Fund. EHF is responsible for working with expert scientific review panels to provide independent evaluation of grant applications and administer grants to fund cancer research.



Andy Hill CARE Fund

Washington's Cancer Research Endowment

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The Andy Hill Cancer Research Endowment (CARE) Fund is named in honor of State Senator Andy Hill who was a dedicated legislator and public champion of cancer research. He lost his battle with cancer at the age of 54. The CARE Fund carries on his legacy of promoting cancer research and ensuring access to scientific advancements.