

The Life Sciences Discovery Fund supports innovative research in Washington state to promote life sciences competitiveness, enhance economic vitality, and improve health and healthcare. The following are awarded grants in the Fund's portfolio of investments to benefit Washington and its citizens.

Project Grant Awards support focused investigator-initiated research studies.

2007

Daniel Chiu, University of Washington

Award Amount: \$763,454

Monitoring Breast Cancer Metastasis and Treatment Efficacy

FOCUS: To develop an effective yet low-cost blood test capable of detecting signs of breast cancer recurrence early to improve survival

ANTICIPATED IMPACT: More effective and targeted treatment for individuals with metastatic breast cancer

David Flum, University of Washington

Award Amount: \$1,334,726

The Surgical Care and Outcomes Assessment Program (SCOAP)

FOCUS: To define, measure and improve the quality of surgical care practices

ANTICIPATED IMPACT: Widespread adoption of best surgical practices to prevent unnecessary procedures and mistakes

William Hagopian, Pacific Northwest Diabetes Research Institute

Award Amount: \$918,828

Diabetes Evaluation in Washington Study

FOCUS: To determine the feasibility of establishing universal newborn type 1 diabetes susceptibility screening for Washington state

ANTICIPATED IMPACT: Reduction in costs and crises for individuals and families living with type 1 diabetes

Jeffrey Hummel, Qualis Health

Award Amount: \$398,049

Applying Health Information Technology to Improve Medication Management

FOCUS: To define the business case for using technology to improve the medication reconciliation process as part of the ambulatory care workflow

ANTICIPATED IMPACT: Changing the patient culture on the importance of knowing their medications

Cornelius Ivory, Washington State University

Award Amount: \$750,000

Rapid Fingerprinting of Cardiac Biomarkers

FOCUS: To design a miniaturized blood test for both point-of-care and emergency diagnosis of cardiovascular disease based on the mass distribution of a family of cardiac biomarkers

ANTICIPATED IMPACT: Improved allocation of health-care resources through more efficient patient triage

David Newell, Swedish Neuroscience Institute

Award Amount: \$169,532

Intracranial and Intraventricular Hemorrhage with Ultrasound-Enhanced Thrombolysis

FOCUS: To demonstrate that ultrasound can accelerate the delivery of drugs to improve stroke treatment

ANTICIPATED IMPACT: Improved outcomes for stroke patients

2008

Clifford Berkman, Washington State University

Award Amount: \$679,964

Chemoaffinity Agents for the Detection of Prostate Cancer

FOCUS: To demonstrate a new approach to imaging prostate tumors
ANTICIPATED IMPACT: Earlier prostate cancer diagnosis and improved targeted treatment therapies

Diane Cook, Washington State University

Award Amount: \$790,906

Smart Home-Based Health Platform for Functional Monitoring and Intervention

FOCUS: To create a "smart environment" that enables older adults or individuals experiencing cognitive or physical limitations to function independently and remain in their own home setting

ANTICIPATED IMPACT: Cost savings to rehabilitation and nursing care services

Eberhard Fetz, University of Washington

Award Amount: \$1,068,985

Brain-Computer Interfaces for Functional Recovery from Brain Injury

FOCUS: To increase functional recovery in damaged areas of the brain using implantable electrical stimulators

ANTICIPATED IMPACT: Improved outcomes for stroke and brain injury patients

Cecilia Giachelli, University of Washington

Award Amount: \$1,469,606

Engineering Monocytes to Treat Ectopic Calcification

FOCUS: To develop technologies for local human cell therapies that can treat or prevent tissue calcification

ANTICIPATED IMPACT: Improved health outcomes and quality of life for individuals with calcific diseases

Pierre Mourad, University of Washington

Award Amount: \$224,958

Transcutaneous Acoustic Palpation (TAP) for Localizing Painful Pathology

FOCUS: To demonstrate the use of intense-focused ultrasound in identifying the source of deep pain

ANTICIPATED IMPACT: Improved diagnosis of painful medical conditions

Patrick Stayton, University of Washington

Award Amount: \$968,915

Self-Powered Smart Cards for Diagnostic Screening

FOCUS: To develop a rapid, low-cost, self-powered, easy-to-use device to detect infectious agents in blood

ANTICIPATED IMPACT: Less costly, easily accessible diagnostic services

2009

Norman Karin, Battelle, Pacific Northwest Division

Award Amount: \$1,022,867

A Cost-Effective Hydrogel-Growth Factor Complex to Improve Bone Healing

FOCUS: To develop safe, effective, and inexpensive implant materials to promote bone regeneration

ANTICIPATED IMPACT: New cost-effective technologies for stimulating bone healing in both humans and animals

Daniel Leotta, University of Washington

Award Amount: \$509,051

Imaging Oximetry of Peripheral Ischemia for Identification of Amputation Level

FOCUS: To develop an easy-to-use, low-cost, noninvasive portable device that can measure local tissue oxygenation and help guide surgeons in performing lower limb amputations

ANTICIPATED IMPACT: Improved outcomes following limb amputation and prediction and monitoring of healing of diabetic foot and pressure ulcers

Andre Lieber, University of Washington

Award Amount: \$202,759

Peptides that Increase the Efficacy of Monoclonal Antibody Therapy of Cancer

FOCUS: To validate the preclinical effectiveness and safety of a novel molecule that enhances the anti-tumor actions of a chemotherapeutic agent

ANTICIPATED IMPACT: Improved outcomes in cancer patients following treatment with monoclonal antibodies

Adrian Ozinsky, Institute for Systems Biology

Award Amount: \$700,871

High-Throughput Generation of Monoclonal Anti-Peptide Antibodies for High Sensitivity Targeted MS Analysis of Biomarker Candidates

FOCUS: To develop new technologies for biomarker verification and conduct initial validation of prostate cancer biomarker candidates
ANTICIPATED IMPACT: Accelerated translation of biomarker candidates into commercial assays for the diagnosis and monitoring of prostate cancer and other major diseases

Tomikazu Sasaki, University of Washington

Award Amount: \$1,451,136

Development of Artemisinin Compounds for Cancer Treatment

FOCUS: To develop new cancer therapeutics and poultry anti-microbials from a natural product

ANTICIPATED IMPACT: New cost-effective agents for cancer chemotherapy and environmentally safer poultry cultivation

Diter von Wettstein, Washington State University

Award Amount: \$1,099,998

Wheat for Celiac Patients and Improved Disease Prevention

FOCUS: To generate wheat that is safe for individuals with celiac disease

ANTICIPATED IMPACT: Improved health and quality of life for individuals with celiac disease and potential prevention of the disease in others

Program Grant Awards support the launch of new collaborative research initiatives that address major problems within a field of study and position organizations for future competitiveness and leadership.

2007

Martin Cheever, Fred Hutchinson Cancer Research Center

Award Amount: \$2,237,265

Fred Hutchinson/University of Washington Cancer Consortium Phase 1 Clinical Trials Program

FOCUS: To develop a Phase 1 Cancer Clinical Trials Program for accelerating the development of new cancer-fighting drugs

ANTICIPATED IMPACT: Cancer patient access to Washington-based, early-stage drug trials and development

Gail Jarvik, University of Washington

Award Amount: \$5,339,742

Institute for Genetic Medicine

FOCUS: To build a new infrastructure that will enable clinical investigation of medical genetics using rapid analysis of genomic data

ANTICIPATED IMPACT: Improved personalized medical care and disease prevention

Patricia Kuhl, University of Washington

Award Amount: \$4,033,304

Early Learning and Brain Development: MEG Brain Imaging Center for Infants and Children

FOCUS: To establish a regional child brain imaging center to utilize the latest in brain imaging technology to measure the young brain in action and to explore the basic mechanisms that underlie early learning and lay the foundation for lifelong learning

ANTICIPATED IMPACT: Improved understanding of early childhood behaviors, syndromes, and disabilities

Gerald Nepom, Benaroya Research Institute at Virginia Mason

Award Amount: \$5,575,200

Program for Autoimmune Disease Intervention (PADI)

FOCUS: To apply genetic and immunologic discoveries to benefit people with autoimmune diseases such as type 1 diabetes, multiple sclerosis, and lupus

ANTICIPATED IMPACT: Improved diagnosis and treatment of autoimmune diseases

Richard Smith, Battelle, Pacific Northwest Division

Award Amount: \$4,830,000

Next Generation Clinical Proteomics to Target Human Health Challenges

FOCUS: To develop a new proteomics technology for the large-scale study of proteins and to apply this technology in search of biomarkers for liver disease

ANTICIPATED IMPACT: Earlier, less invasive diagnosis, monitoring, and management of chronic diseases

2008

Lawrence Corey, Fred Hutchinson Cancer Research Center

Award Amount: \$4,727,296

Washington Vaccine Alliance

FOCUS: To develop an integrated, multi-institutional program to stimulate discovery and development of vaccines for widespread use

ANTICIPATED IMPACT: New vaccines to prevent or treat herpes simplex virus-2, syphilis, and *E. coli* contamination

Thomas Rea, Seattle & King County Department of Public Health

Award Amount: \$2,653,031

Program to Integrate Technology and Cardiac Arrest Resuscitation

FOCUS: To improve cardiac resuscitation technology and resuscitation outcomes

ANTICIPATED IMPACT: Statewide training and implementation of improved cardiac resuscitation methods and enhanced survival following sudden cardiac arrest

John Roll, Washington State University

Award Amount: \$4,048,617

Program of Excellence in Rural Mental Health and Substance Abuse

FOCUS: To improve the delivery of mental health and substance abuse services in rural, underserved communities

ANTICIPATED IMPACT: Improved management of substance abuse and mental illness in rural areas through testing and implementation of appropriate evidence-based treatments

Patrick Stayton, University of Washington

Award Amount: \$7,163,794

Center for Intracellular Delivery of Biologics

FOCUS: To better deliver drugs to their site of action within cells

ANTICIPATED IMPACT: Enhanced treatment of cancer, pulmonary trauma, and other major disorders with fewer side effects

2009

Stephen Friend, Sage Bionetworks

Award Amount: \$4,999,996

Sage Integrative Bionetwork Community: Scalable Resource for the State of Washington

FOCUS: To more accurately and comprehensively model biological systems through their network of interactions

ANTICIPATED IMPACT: Identification of molecular pathways that can be targeted to develop safer and more effective drugs and diagnostic tests

Thomas Matula, University of Washington

Award Amount: \$4,999,999

Molecular Imaging and Therapy Using Ultrasound

FOCUS: To develop, translate and commercialize new ultrasound techniques for molecular imaging and therapy

ANTICIPATED IMPACT: New ultrasound-based molecular approaches for the diagnosis and treatment of cancer and other major diseases

Peggy Porter, Fred Hutchinson Cancer Research Center

Award Amount: \$4,995,711

Consortium Biospecimen Program

FOCUS: To develop a comprehensive biological specimen collection and distribution system to facilitate cancer research across Washington

ANTICIPATED IMPACT: More effective cancer therapies and improved tests for early diagnosis and prediction of treatment responses

Commercialization Grant Awards support small-scale, highly targeted studies that move technologies along the pathway to the marketplace.

2009

Philip Fleckman, University of Washington

Award Amount: \$150,000

Cutaneous Healing into Porous Biomaterials Impedes Infection

FOCUS: To test the ability of a percutaneous catheter to resist infection

ANTICIPATED IMPACT: Reduced morbidity and mortality in patients with skin-penetrating devices and commercialization of the novel device by a Washington-based company

Cecilia Giachelli, University of Washington

Award Amount: \$150,000

Bioengineered Osteopontin to Treat Vascular Calcification or "Hardening of the Arteries"

FOCUS: To test the ability of an optimized osteopontin molecule to inhibit or reverse calcium deposition in blood vessels

ANTICIPATED IMPACT: Commercialization of a new drug by a Washington-based company that will extend survival in individuals with heart disease

Kenneth Schenkman, University of Washington

Award Amount: \$150,000

Noninvasive Clinical Monitor for Early Detection of Shock

FOCUS: To test a new instrument for the diagnosis and monitoring of shock

ANTICIPATED IMPACT: Improved outcomes in trauma patients and formation of a new start-up company to commercialize the shock monitor

2010

Julie Brown, Seattle Children's Hospital

Award Amount: \$150,000

A Randomized Clinical Trial of Pediatric Lumbar Puncture Success using The Compass, a Compact Quantitative Pressure Transducer

FOCUS: To test if a pressure transducing device increases the success of lumbar puncture

ANTICIPATED IMPACT: Greater success in lumbar punctures

2010

David Flum, University of Washington

Award Amount: \$2,264,714

SCOAP Comparative Effectiveness Research Translation Network

FOCUS: To expand and leverage datasets on quality of surgical care and collect patient outcomes, which will allow the health-care system to dynamically "learn" from patient care

ANTICIPATED IMPACT: Increased use of health-care best practices, resulting in improved patient outcomes and reduced health-care expenditures

Michael Schwartz, University of Washington

Award Amount: \$3,994,222

A Program for Cell-Based Diabetes Therapy

FOCUS: To develop human stem cells to restore insulin secretion function in patients with type 1 diabetes

ANTICIPATED IMPACT: Improved and potentially curative treatment for type 1 diabetes

John Slattery, University of Washington

Award Amount: \$1,750,000

Washington Phenotyped Biospecimen Resource

FOCUS: To develop a resource to provide high-quality, information-rich biological samples to researchers and startup companies statewide

ANTICIPATED IMPACT: Improved diagnostics and treatments for major health conditions

Jane Burns, Seattle Children's Hospital

Award Amount: \$150,000

Non-invasive Detection of *Pseudomonas aeruginosa* in the Exhaled Breath of Individuals with Cystic Fibrosis

FOCUS: To adapt a novel air sampling device to collect exhaled breath for non-invasive detection of lung infections

ANTICIPATED IMPACT: Enhanced ability to detect poorly diagnosed lung infections (particularly in children who cannot produce sputum) and treat them appropriately

Rodney Ho, University of Washington

Award Amount: \$149,999

Gadolinium-Lipid Nanoparticles for More Effective and Safe Medical Diagnosis with MRI

FOCUS: To test the safety and pharmacology of a novel magnetic resonance imaging (MRI) contrast agent

ANTICIPATED IMPACT: A safer MRI contrast agent with improved imaging characteristics

Barry Lutz, University of Washington

Award Amount: \$149,461

An Auto-regulated Externalized Cerebrospinal Fluid Drainage System for Improved Control, Safety, and Patient Mobility in Neurosurgery Patients

FOCUS: To develop a prototype of an improved externalized cerebrospinal fluid drainage system and test it under simulated patient conditions

ANTICIPATED IMPACT: The new drainage system promises greater patient mobility and improved safety, and requires less staff time to manage

Harlan Robins, Fred Hutchinson Cancer Research Center

Award Amount: \$150,000

High-Throughput Sequencing of T-Cell Receptors

FOCUS: To scale up a high-throughput T-cell receptor gene sequencing service to expand researcher access and enable better diagnostics and treatments for conditions involving the immune system

ANTICIPATED IMPACT: Enhanced competitiveness of the collaborating in-state company and the broader immunology research community, which may improve the diagnosis and treatment of immune-related conditions

Eric Seibel, University of Washington

Award Amount: \$150,000

Laser Imaging for Early Caries Detection and Cost-Effective Oral Health

FOCUS: To develop a low-cost imaging system for early detection of tooth decay

ANTICIPATED IMPACT: An early-warning system for tooth decay that will enable more cost-effective management of caries lesions and improved dental health

Patrick Stayton, University of Washington

Award Amount: \$150,000

Next Generation High Speed Immunoassay

FOCUS: To improve the speed and sensitivity of immunoassays using environmentally sensitive (smart) polymer technology

ANTICIPATED IMPACT: Improved clinical decision-making resulting from faster and more sensitive immunoassays

Gregory Terman, University of Washington

Award Amount: \$149,976

Olfactory Delivery of Centrally-Acting Analgesics

FOCUS: To conduct first-in-human testing of a novel device that can deliver drugs directly to the central nervous system

ANTICIPATED IMPACT: Effective treatment of pain or other neurological conditions while avoiding accidental overdoses and side effects

2011

Diane Cook, Washington State University

Award Amount: \$149,312

CASAS-Care: Pilot Study of a Smart Home in a Box

FOCUS: To test user-installed technology that monitors older adults at home and provides reminders to perform key tasks

ANTICIPATED IMPACT: Cost savings for rehabilitation and nursing care services, and improved quality of life for the elderly

David Linker, University of Washington

Award Amount: \$150,000

Screening for Atrial Fibrillation, a Cause of Preventable Strokes

FOCUS: To conduct human subjects testing of a prototype of a small, comfortable, inexpensive, and highly accurate monitor capable of screening for atrial fibrillation

ANTICIPATED IMPACT: Lowered risk of stroke through treatment of individuals with asymptomatic atrial fibrillation

Pierre Mourad, University of Washington

Award Amount: \$150,000

Definitive Human Testing of Pain Localization and Quantification Based on Transcutaneous Acoustic Palpitation (TAP)

FOCUS: To conduct clinical testing of an ultrasound device that allows providers to identify the sources and extent of deep pain

ANTICIPATED IMPACT: Confirmation, localization, and quantification of pain in limbs remaining after amputation, as well as validation of a surgical technique to lessen neuroma-triggered pain

Kenneth Schenkman, University of Washington

Award Amount: \$150,000

Muscle Oxygenation for Noninvasive Stratification of Shock Severity

FOCUS: To improve the team's prototype device for early detection of medical shock and collect clinical data using the enhanced prototype

ANTICIPATED IMPACT: Improved outcomes in shock patients and formation of a start-up company to commercialize the new shock monitor

Opportunity Grant Awards support compelling, time-sensitive initiatives from Washington's life sciences research community.

2009

Deborah Nickerson, University of Washington

Award Amount: \$1,999,650

Northwest Genomics Center

FOCUS: To support the launch of the new Northwest Genomics Center with the purchase of four state-of-the-art gene sequencers

ANTICIPATED IMPACT: New personalized, genetic-based approaches to disease prevention, diagnosis, and treatment

2010

Gregory Demopoulos, Omeros Corporation

Award Amount: \$5,000,000

Drug Discovery for Orphan G Protein-Coupled Receptors

FOCUS: To identify compounds that interact with "orphan" G protein-coupled receptors and develop those compounds into new drug candidates

ANTICIPATED IMPACT: New drugs for major medical conditions such as cancer, obesity, and neurological disorders. A new non-profit initiative to advance the life sciences sector and improve health and economic growth in Washington.

Grant Award Supplements provide additional funding to current grantees to pursue significant research findings or address unexpected disruptions to their work.

2010

David Flum, University of Washington

Award Amount: \$184,256

Impact of SCOAP on Health-Care Resource Use and Cost

FOCUS: To determine costs saved through increased efficiency of surgical care in Washington state

ANTICIPATED IMPACT: A comprehensive analysis to determine health-care cost savings due to implementation of three SCOAP procedures using actual payment data