



35 Years of Supporting Innovation

2015/2016 REPORT



Washington Research

FOUNDATION



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CEO's Message

Marking Washington Research Foundation's 35th anniversary is a good opportunity to reflect on the depth of talent in our state and the importance of the work that we support.

We've had the privilege of working with Dr. Benjamin Hall [profile on page 2], whose yeast technology has improved the health of more than a billion people worldwide. We've supported some of the most exceptional young minds in the country through our partnership with the ARCS Foundation [see page 1]. We've given grants and made venture investments in some of the most innovative projects and startup companies to come out of our local, world-class research institutions. Our focus on research in Washington means that we focus on some of the best researchers in the world.

Tom Cable, Bill Gates Sr. and Hunter Simpson recognized this when they founded WRF in 1981. It was clear to them that the University of Washington and other local institutions were creating valuable intellectual property with the potential to benefit the public and provide much-needed revenue for additional research. At the time, UW had neither the resources nor expertise to successfully license its inventions. WRF was created to fill that gap. Our activities have since expanded, and despite a lack of precedence to predict success, coupled with some lean early years, we have now earned more than \$436 million in licensing revenue for the University of Washington and disbursed over \$66 million in grants to research institutions throughout the state.

We celebrate 35 years, but we have rich choices to make in what we support going forward. There are phenomenal opportunities to accelerate top-10-in-the-world research projects and our immediate challenge is to determine between "Excellent" and "Outstanding." Our legacy, consistent with our founders' vision, will be supporting and accelerating the best inventors and innovators so their teams have the best chance to bring advances into public use.

Ronald S. Howell

Chief Executive Officer

Grant Programs

Washington Research Foundation's grant programs have supported research and scholarship at the state's top institutions since 1993. Through providing grants to the University of Washington (UW), Fred Hutchinson Cancer Research Center, Institute for Systems Biology and Washington State University (WSU), among others, WRF helps to keep these organizations at the cutting edge of world-class research and innovation.

WRF's grants fund research at many levels, with the goal of assisting researchers in commercializing groundbreaking technologies to address unmet public needs. The Foundation's \$10 million pledge to UW Medicine's Heart Regeneration Program (profile on page 4) is WRF's largest single multi-year grant and exemplifies this objective.

The \$31.2 million Funds for Innovation pledge made by WRF to UW in 2014 continues to make a significant impact. Described as a "watershed moment" by UW's then-president Michael Young, this six-year funding program, the largest in WRF's history, supports research and entrepreneurship in four key institutes—clean energy, eScience, neuroengineering and protein design—to address critical societal needs. WRF's funding of these projects has so far enabled the University to hire 55 faculty and postdoctoral fellows in addition to upgrading its facilities.

In 2016, Washington Research Foundation was recognized as the Seattle chapter of the Achievement Rewards for College Scientists (ARCS) Foundation's largest donor. WRF has funded 100 ARCS Fellowships, which help to bring the country's top graduate students to UW and WSU.

Examples of individuals and projects receiving grants from WRF during 2015 and 2016 follow on pages 4 to 7.

Organizations funded by grants from WRF since 1993 include:

ARCS Foundation

Benaroya Research Institute

Bloodworks Northwest

Fred Hutchinson Cancer Research Center

Infectious Disease Research Institute

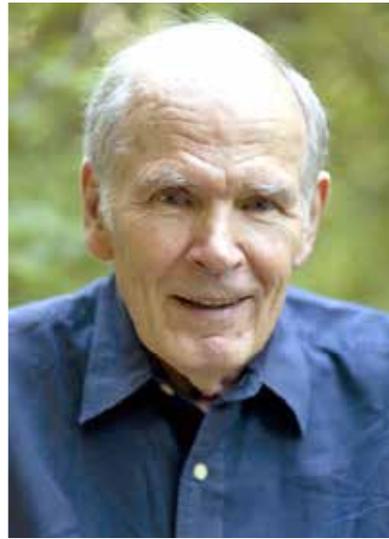
Institute for Systems Biology

Pacific Northwest Research Institute

University of Washington

Washington State University

Western Washington University



Profile

Dr. Benjamin D. Hall

More than a billion people worldwide are living healthier and longer lives because of the research of University of Washington (UW) professor Benjamin Hall and his collaborators.

In the mid-to-late 1970s, UW genetics professor Hall was a pioneer in studying and characterizing transcription of RNA molecules, the initial process in the chain of events by which cells produce their protein constituents. Hall, along with his graduate students Loren Schultz, Janet Kurjan, Jeffrey Bennetzen, Guy Page, Paul Russell, and postdoctoral fellows Ray Adman, Gustav Ammerer, Kim Nasmyth, Maynard Olson, Donna Montgomery and Kelly Tatchell, discovered that several yeast RNA polymerases—enzymes used in transcription—shared structural characteristics and functional roles with RNA polymerases found in the nuclei of plant and animal cells. Hall and his colleagues were then able to clone genes from yeast to enable a more detailed study of the transcription process, taking advantage of the advanced state of genetic analysis in both the yeasts *Saccharomyces cerevisiae* and *Schizosaccharomyces pombe*. Hall said, regarding this period, “I picked the best people available, and it all worked out.”

Hall's yeast research continued, primarily funded by National Institutes of Health grants. He and his team reached out to colleagues at other institutions to facilitate development of the yeast system for gene expression. Hall, Ammerer, and colleagues at Genentech were inventors on the U.S. patent Expression of Polypeptides in Yeast (applied for in 1981; issued

in 1999), which claimed and described a method of creating genetically engineered proteins in yeast. The patent was jointly assigned to WRF and Genentech, and licensed to dozens of pharmaceutical and biotechnology companies. The technology enabled these companies to develop some of the world's most important vaccines, as well as therapeutic and diagnostic proteins. Synthesis and Assembly of Hepatitis B Virus Surface Antigen, an invention by Hall, Ammerer, and colleagues Bill Rutter and Pablo Valenzuela at UCSF that resulted in a patent jointly assigned to the University of California and WRF, set forth how to use the yeast expression method to make the active ingredient of the hepatitis B virus (HBV) vaccine.

Insulins manufactured by Novo Nordisk reach tens of millions of diabetic patients each day. Vaccines produced by GlaxoSmithKline and Merck & Co. are estimated to have reached over a billion patients and prevented millions of cases of hepatitis B and hepatocellular carcinoma, the most common type of liver cancer. Novartis Vaccines & Diagnostics (formerly Chiron) manufactures diagnostic proteins that are used by blood banks worldwide to test the safety of blood products prior to transfusion. All of these products were manufactured in yeast using the Ammerer and Hall procedure for protein expression.

Gardasil, a human papillomavirus (HPV) vaccine manufactured by Merck using Hall's “Expression” method, received FDA approval in 2006 and is recommended by the CDC as a routine

vaccination for females and males to help prevent HPV-related diseases including oral, genital and cervical cancers. With around 500,000 cases of cervical cancer diagnosed worldwide each year, the potential impact on the health of present and future generations is enormous. Loren Schultz, a Merck employee who initiated studies on yeast RNA polymerases as Hall's Ph.D. student, was a key member of the Gardasil development team.

In addition to the global health benefits provided by Hall's work, his influence on Washington state research has been tremendous. As one of the most successful university inventions of all time,

the "Expression" licensing portfolio has generated hundreds of millions of dollars for UW and has enabled WRF to provide funding to UW and other state research institutions to recruit and retain professors, provide student and postdoctoral fellowships, and to fund large research projects and programs.

Hall is revered as a mentor. Around 50 undergraduate students, graduate students and postdoctoral fellows have come through his lab and gone on to achieve success in academia and industry. He has long been an advocate for diversity in research, bringing together men and women with wide-ranging specialties, training and ethnic backgrounds. The 146,000-square-foot Benjamin D. Hall Interdisciplinary Research Building at UW opened in 2006 to facilitate this approach.

Ammerer described the environment in Hall's lab as "a hub of collaborations, not only within the UW campus, but also of external collaboration that reached from Vancouver and San Francisco to Germany and Switzerland. What really struck me with 'Big Ben,' as we called him, was his optimistic vision, his

More than a billion people worldwide are living healthier and longer lives because of the research of University of Washington (UW) professor Benjamin Hall and his collaborators.

openness to other people's ideas, his unending enthusiasm and how he guided a rather chaotic lab environment into something where everyone felt important as a player of a winning team."

Today, Seattle is considered to be one of the leading biotech cities in the nation. This too was an area influenced by Hall. As a co-founder of ZymoGenetics (then Zymos) in 1981, Hall was responsible for building one of the city's first biotech companies. ZymoGenetics has successfully commercialized many of its original research products, including Recothrom to control surgical bleeding, Novolin recombinant insulin (in collaboration with Novo Nordisk) and Cleactor, in partnership with Eisai, to treat heart attacks.

In his later career, Hall turned his attention to the study of rhododendrons and azaleas in North America and Asia. He and his colleagues have used DNA sequencing to better understand the speciation, evolution and biogeographic history of the more than 1,000 species that make up the genus *Rhododendron*.

This has long been an area of interest for the Hall family, with Ben's father E. Raymond Hall, a university professor and natural history expert, having a deep interest in biosystematics and evolution. Ben's mother, Mary Frances Hall, shared Raymond's interest in these fields, as did Ben's brother, Hubert H. Hall.

Despite retiring nearly 10 years ago, Hall continues to mentor students in his UW lab, which has been wholly self-funded since 1998 through royalties from his inventions. Hall was the inaugural winner of the UW School of Medicine's Inventor of the Year award in 2004. In 2010, he received the University of Kansas Distinguished Service Award and was elected to the American Academy of Arts and Sciences. Hall was selected for membership to the National Academy of Sciences in 2014 for "distinguished and continuing achievements in original research."



Grant Profile

Institute for Systems Biology

Institute for Systems Biology (ISB), a Seattle biomedical research organization, received a \$2 million grant from WRF in September 2015 to further its P4 wellness program.

P4 medicine, which is predictive, preventive, personalized and participatory, helps users to understand their specific health risks and adjust their diet and lifestyle accordingly. Aimed at preventing rather than curing disease, it empowers users to take control of their wellbeing and has the potential for enormous financial savings for individuals and the healthcare system.

ISB used data from its Hundred Person Wellness Project pilot study to develop the 100K Wellness Project and spin out a company, Arivale. Arivale identifies critical areas of clients' biology and lifestyle to head off health problems before they begin.

WRF's funding will enable ISB to set up a faculty-led research team that will work with the University of Washington's computer science and engineering department. This new group will have the capacity to analyze vast quantities of data to further develop its wellness programs and keep Seattle at the forefront of this emerging industry.



Grant Profile

UW Medicine

Heart disease is the leading cause of death for men and women in the United States, and Charles Murry, M.D., Ph.D., and his team at UW Medicine are committed to changing this within 10 years.

Murry is the co-director of the Institute for Stem Cell and Regenerative Medicine (ISCRM). ISCRM's Heart Regeneration Program develops stem cell therapies for heart disease, focusing on regenerating heart tissue in patients at risk of congestive heart failure following a heart attack. The tissue damage caused by heart attacks is usually permanent and vastly increases a patient's risk of future problems.

The Heart Regeneration Program has repaired hearts in animal models by implanting healthy cardiac muscle cells into the damaged heart.

WRF pledged \$10 million to Dr. Murry and his colleagues to develop a method of growing healthy cardiac muscle that can be implanted into patients soon after they suffer a heart attack. The hope is to begin testing this novel heart regeneration method in clinical trials by the end of the five-year grant.

WRF Innovation Assistant Professor
Bing Brunton

Bing Brunton is the WRF Innovation Assistant Professor at the University of Washington's Institute for Neuroengineering (UWIN). She is jointly appointed by UW's biology department.

Brunton's research focuses on the intersection of neuroscience and data science—primarily, the ways in which computer models can be used to analyze how large networks of neurons and the electrical signals they use to communicate can give rise to sensation, action, decisions and emotions. Brunton takes vast quantities of data from human and animal brain activity and analyzes it for coherent patterns, looking for correspondences between these patterns and behavior. From this, she builds mathematical models to understand brain function and aims to develop programmatic approaches to intervene during brain dysfunction.

Following her bachelor's degree in biology from Caltech, Brunton completed her Ph.D. at Princeton. The WRF funding enabled UWIN to hire Brunton, allowing her to make the transition from postdoctoral researcher to faculty and set up a research group in the process.

Brunton was awarded a Sloan Fellowship, which honors "early-career scientists whose achievements and potential identify them as rising stars," in 2016.



WRF Innovation Professor
J. Devin MacKenzie

Devin MacKenzie joined UW in 2015 as the WRF Innovation Professor for Clean Energy. In addition, he is a professor in UW's mechanical engineering and materials science & engineering departments.

MacKenzie's expertise in emerging materials, including printed and flexible electronics and thin film batteries, has a number of industrial applications. They can be used in wearable medical devices and electric cars, for example, and MacKenzie's goal is to make production of these materials cheaper so they can be more widely adopted by current and new markets.

Prior to joining UW, MacKenzie was CEO of Imprint Energy, a UC Berkeley spinout recognized among the 50 Smartest Companies by MIT Technology Review and a multiple winner of the Global Cleantech 100 award. MacKenzie co-founded the University of Cambridge's Plastic Logic, which developed the world's first inkjet-printed plastic screen for mobile use.

MacKenzie received his Ph.D. from the University of Florida and his bachelor's from MIT. He was instrumental in securing funding for NextFlex, a consortium of public and private organizations whose mission is the advancement of U.S.-based manufacturing of flexible electronics.

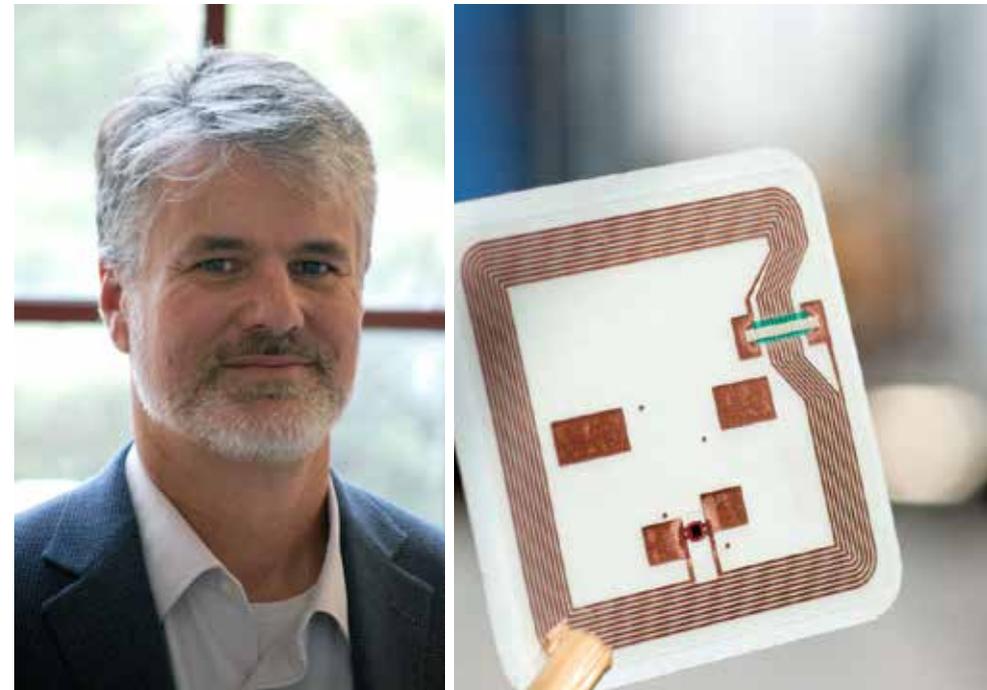
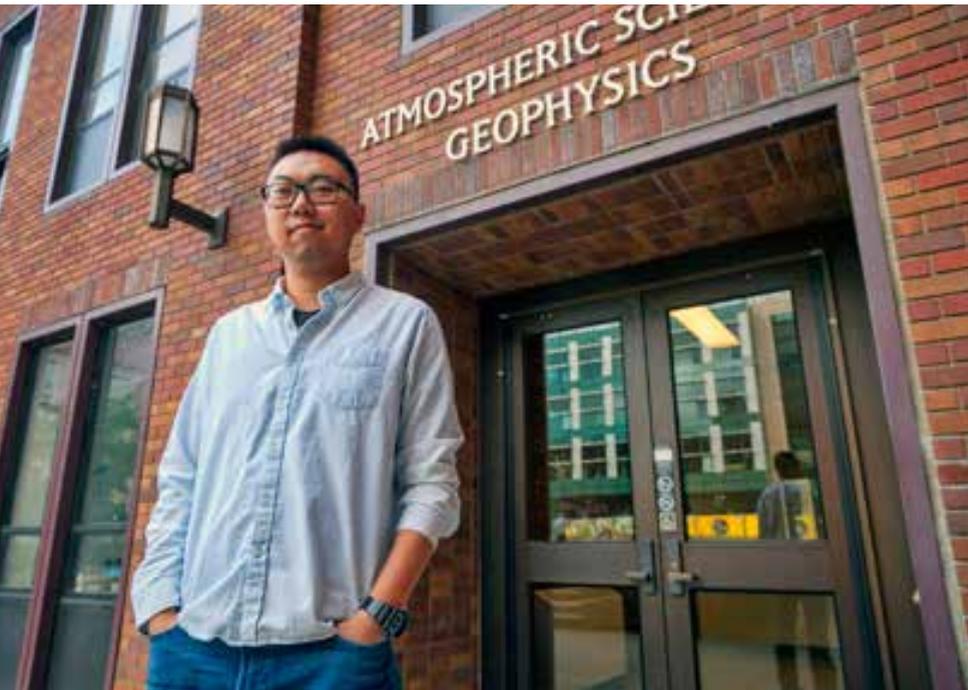


PHOTO BY: UNIVERSITY OF WASHINGTON



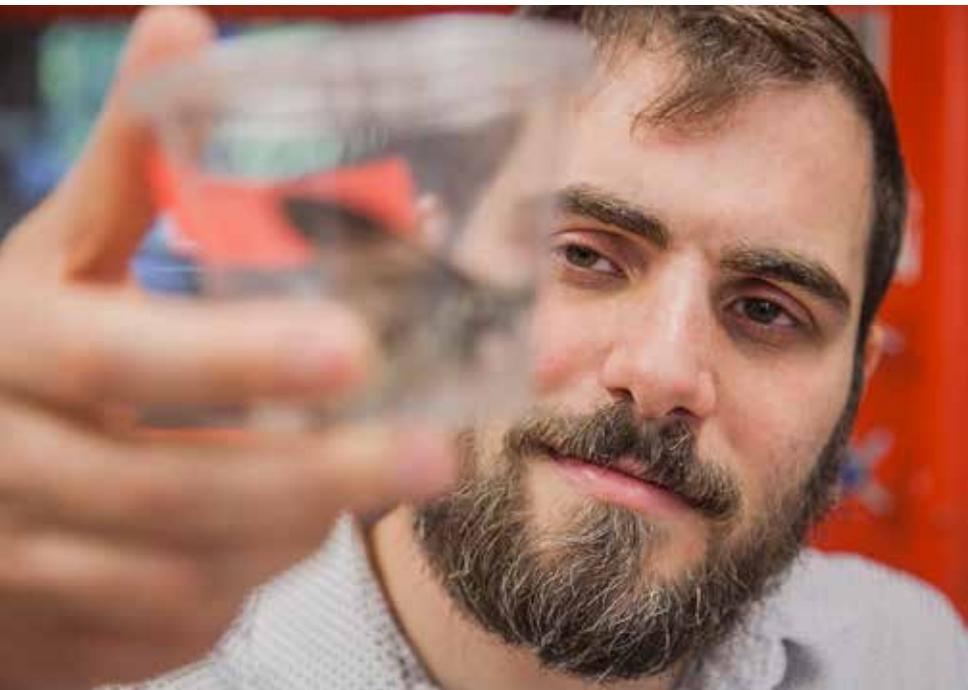
WRF Innovation Fellow
Xiaofeng Meng

Xiaofeng Meng joined the University of Washington's eScience Institute as a WRF Innovation Fellow in 2015.

Meng is working with the Pacific Northwest Seismic Network, a collaboration between UW and the University of Oregon, to develop an auto-correlation technique to identify risks from volcanic and seismic activity in the 700-mile Cascadia subduction zone. Being able to recognize pending catastrophic events is a vital part of protecting the tens of millions of people who live in the region.

Cascadia is the potential source of "The Really Big One," a massive earthquake that could devastate much of the west coast should it occur. Cascadia has produced several quakes of magnitude 9 or greater and is believed to have triggered activity along the San Andreas Fault. Some of the most potentially destructive volcanoes in the U.S. are located in Cascadia: examples include Mount Rainier, Mount St. Helens and Mount Mazama, the eruption and subsequent collapse of which created Oregon's Crater Lake.

Prior to joining UW, Meng earned his Ph.D. and was a postdoctoral fellow at Georgia Institute of Technology. He holds a bachelor's in physics from Beijing Normal University.



WRF Innovation Fellow
Eatai Roth

In the University of Washington's Biology and Aeronautics & Astronautics departments, WRF Innovation Fellow Eatai Roth investigates how animals use sensory information to navigate through and interact with their environments. Roth applies tools from engineering to study flight behaviors in the hawkmoth *Manduca sexta*. In recent work, Roth has studied how moths follow a robotically controlled artificial flower while feeding, as they would in nature when a flower sways in the wind. The moth proboscis, the long straw-like mouth part which draws nectar from the flower, is covered with sensory bristles that encode bending. Roth discovered that moths combine this proboscis-bending information with visual cues to control flight while feeding in windy conditions.

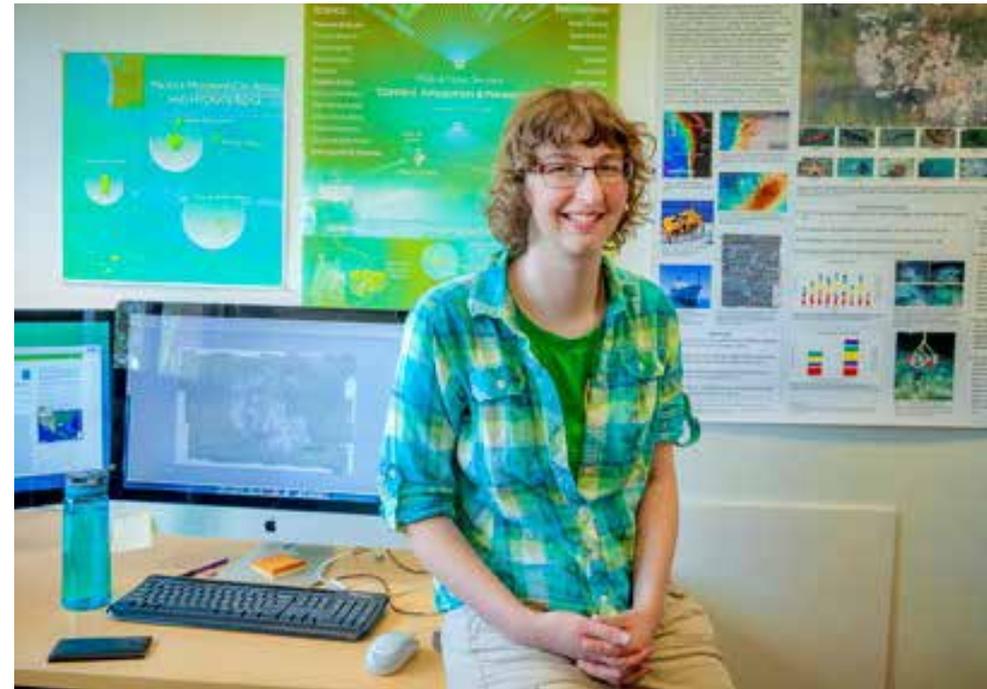
The WRF Fellowship is supporting Roth in developing a novel virtual reality arena for studying how insects adapt flight to changes in the environment or their own bodies—such as sudden weight gain from feeding. This research addresses fundamental questions in neuroscience and reveals biological control principles that can be translated to engineered systems, such as autonomous robots and flying vehicles.

WRF Undergraduate Research Fellow **Katie Bigham**

Monroe, Washington-native Katie Bigham is a WRF Undergraduate Research Fellow in Deborah Kelley's lab at the University of Washington's School of Oceanography. She researches the abilities of some life forms to survive in extreme conditions, and is currently studying the ecology near a methane seep at the Southern Hydrate Ridge off the coast of Oregon. The OOI Cabled Array, a National Science Foundation-funded networked sensor system that measures seabed and ocean variables, is enabling greater collaboration between Bigham and researchers at other sites than would otherwise be possible.

Among other benefits, Bigham says, the WRF Fellowship provided her with the means to present her research at the 2016 Benthic Ecology Meeting in Maine, a key event for scientists in the field.

Bigham plans to pursue a Ph.D. in oceanographic sciences, continuing her research into life in the most severe environments. She ultimately hopes to have her own lab, with the goal of better understanding the impacts of climate change and the ability of life to adapt accordingly.



ARCS Fellow **Erin dela Cruz**

Erin dela Cruz is an ARCS Fellow in the University of Washington's Molecular & Cellular Biology Ph.D. program, which partners UW with local organizations Fred Hutch, Institute for Systems Biology and the Center for Infectious Disease Research. She expects to graduate in 2017.

Dela Cruz's research focuses on the role of vaginal lactobacilli in the development of bacterial vaginosis (BV). BV is a condition that most commonly affects women of reproductive age and can cause premature birth and additional complications if developed during pregnancy. BV also increases the risk of catching or transmitting other STDs, including HIV.

Dela Cruz's findings come from analyzing large data sets derived from patient studies, drawing from the background in applied mathematics and public health she gained at UC Berkeley during her bachelor's program. The ARCS Fellowship, funded by WRF, was an important factor in her decision to attend UW and has alleviated some of the financial distractions students often face.

Upon completing her Ph.D., dela Cruz plans to pursue her M.D., become a pediatric infectious disease physician and continue research in the field of host-microbe interactions.



PHOTO BY: KRISTIN ZWIERS



WRF Capital

WRF Capital is the venture investment arm of Washington Research Foundation. As a leading early-stage investor, WRF Capital partners with other local investors, entrepreneurs, universities and research institutions to develop market-leading technology companies in Washington state.

Since 1995, WRF Capital has invested in 68 life sciences, physical sciences and information sciences companies. WRF uses proceeds from these investments to fund research and scholarship in the state of Washington through its grant programs.

Recent highlights from WRF Capital's portfolio include the following:

WRF is a limited partner of the **W Fund**, which invested in seven new companies. WRF matched the W Fund's new investments in Aqueduct Neurosciences, Cyrus Biotechnology, HyperSciences, M3 Biotechnology, Stasys Medical, TwinStrand Biosciences and WiBotic, along with follow-on financings in AnswerDash, BEAT Biotherapeutics, C-SATS, Cyrus Biotechnology, Hypersciences, Nexgenia, Stasys Medical and Vicis.

University of Washington spinout **Cardiac Insight** acquired Cardea Associates as it continues to develop body-worn ECG sensors. Cardiac Insight's primary product aims to assist the diagnosis of atrial fibrillation, a potentially fatal heart condition. The Cardea acquisition brings the handheld ECG device CardeaScreen into the company's product lineup. CardeaScreen monitors young athletes for factors associated with sudden cardiac arrest.

Summaries of the successes enjoyed by **Alder Biopharmaceuticals**, **AnswerDash**, **Juno Therapeutics**, **Nexgenia**, **Phytelligence** and **Skytap** follow on pages 9-11.

Other examples from WRF Capital's portfolio:

Accium BioSciences

Arzeda Corporation

C-SATS

EnerG2

Faraday Pharmaceuticals

FlexMinder

Modumetal

nLIGHT

Shippable

Portfolio Company

Alder Biopharmaceuticals

Alder Biopharmaceuticals, based in Bothell, WA, followed its 2014 initial public offering with clinical trials success in 2015.

Alder's lead drug, ALD403, is a preventive treatment for chronic migraines. In Phase 2 trials, up to 41 percent of patients reported an end to their migraines, with a single dose providing effective treatment for up to six months. Phase 2b trials were also completed, and Phase 3 trials were initiated for further testing in 600 patients.

Clazakizumab (formerly ALD518), Alder's treatment for rheumatoid arthritis, successfully completed Phase 2 trials during the year. Randall Schatzman, Alder's CEO, told CNBC that in a head-to-head trial with best-selling drug HUMIRA, clazakizumab led to remission for more patients.

CNBC's Jim Cramer described Alder as targeting "gigantic unmet needs" in the treatment of migraines and rheumatoid arthritis.

WRF Capital received one of the largest returns in its history through the sale of its shares in Alder and will use the proceeds to fund its grant programs and future local investments.



Portfolio Company

AnswerDash

In 2013, AnswerDash (formerly Qazzow) became the first company to spin out from the University of Washington's Information School. AnswerDash's software as a service (SaaS) offers customer support to companies' websites by providing instant answers to likely questions from any webpage. This eliminates the need for customers to look for a site's FAQ page and reduces their likelihood of having to call a customer helpline. AnswerDash says that the improved online experience its service offers can increase customer conversions by 30 percent and reduce support costs by 60 percent.

AnswerDash hired technology veteran Bill Colleran as its CEO in 2015 and raised \$2.9 million in venture funding from WRF Capital and others. The cash is enabling AnswerDash to expand its sales and marketing efforts as it continues to enhance its service.

AnswerDash was named one of Gartner's Cool Vendors in CRM Customer Service and Support, in addition to being featured in Website Magazine's 5 Companies Disrupting the Web.





Portfolio Company **Juno Therapeutics**

Fred Hutch spinout Juno Therapeutics is building a biopharmaceutical company focused on re-engaging the body's immune system to revolutionize the treatment of cancer. Using human cells as therapeutic entities, Juno is developing cell-based cancer immunotherapies based on chimeric antigen receptor (CAR) and high-affinity T cell receptor (TCR) technologies to genetically engineer T cells to recognize and eliminate cancer.

Juno's late-2014 initial public offering was followed by a number of major breakthroughs in 2015 and 2016.

Clinical data showed progress for Juno's CD19-directed program in a number of cancers, including acute lymphoblastic leukemia, non-Hodgkin lymphoma and chronic lymphocytic leukemia. The company is on track to bring its first product candidate to market as early as 2017 in relapsed/refractory adult acute lymphoblastic leukemia and continues to develop product candidates across multiple targets and additional cancers, including solid tumors.

A collaboration with Celgene enhances Juno's global presence. Acquisitions of AbViro, X-Body and Stage Cell Therapeutics GmbH and licensing deals with Fate Therapeutics, Editas and AstraZeneca/MedImmune will boost Juno's research and development capabilities.

MIT Technology Review ranked Juno number eight on its 50 Smartest Companies 2015 list. WRF Capital's investment in Juno resulted in one of its largest-ever returns on investment.



Portfolio Company **Nexgenia**

Nexgenia spun out of UW and uses technology from the University to develop and manufacture reagents for use in cancer immunotherapies.

Cancer immunotherapies work by triggering the patient's immune system to kill off malignant cells. This is done by removing healthy T cells from the blood, reengineering them and administering them back to the patient to kill the cancerous cells. Immunotherapies can be highly effective, but they need to be individually tailored to each patient and are expensive and time-consuming as a result.

Nexgenia's advanced polymer-based reagents speed up this procedure by more efficiently separating blood cells. In addition to reducing the risk of contamination that can occur when samples are processed outside the body, treatment can be expedited and the cost reduced significantly.

Nexgenia announced a collaboration with Seattle Children's Research Institute (SCRI) in late 2015 to enable the organizations to combine their resources and increase the rate of development for these therapies. Nexgenia expects that combining its technology with antibodies provided by SCRI will increase the rate of progression to large-scale clinical trials.

Portfolio Company

Phytelligence

Phytelligence was founded by Dr. Amit Dhingra in 2012 and is the first biotechnology company to spin out of Washington State University.

Phytelligence is transforming the way food crops are grown. Utilizing its proprietary growing techniques, Phytelligence enables higher grower profit by increasing quality, speed to harvest and reducing input costs. Food crop growers and plant breeders benefit from Phytelligence's advanced genetics application, which enables 100 percent guaranteed delivery of accurate plants, disease screening, plant repository services, securing of intellectual property and the ability to co-develop new varieties of food crops. In addition, Phytelligence has a growing pipeline of biological and compound solutions aimed at improving returns throughout the food crop value chain.

The company completed a \$1.3 million series A round in 2015, which enabled it to secure a 188,000-square-foot greenhouse facility in Burien, Washington and open a large tissue culture lab in Portland. Phytelligence's sales have grown significantly as its team continues the development of new products and fruit varieties.

Phytelligence is headquartered in Seattle, with offices in Pullman, Washington and Portland, Oregon.



Portfolio Company

Skytap

Skytap, a University of Washington spinout that provides a cloud-based platform for software testing and user training from anywhere in the world, continued to disrupt the industry in 2015 and 2016.

Following a \$35 million December 2014 series D investment round, the company released a new mobile app and added several large customers to its books, including GE Healthcare and Schneider Electric. Skytap also added QA Consultants, North America's largest provider of software quality assurance and testing services, to its Skytap TapIn Partner Program. Skytap's services reduce the time it takes to build, test and release software, which GE Healthcare described as leading to a "100-fold" increase in the effectiveness of its training.

Skytap opened a London office to support its expanding global customer base. The company has grown from 53 employees to 160 since 2014 and its revenue increase makes it among the fastest-growing technology companies in Washington state.

Skytap has ranked on the SD Times 100, GeekWire 200 and Deloitte Technology Fast 500 lists, and was the Puget Sound Business Journal's Innovation All-Star winner for a private company.





Current Tenants

Advanced Leadership Consulting
Becauz
BenchMarket Medical
eFund
George Todaro
ID Genomics
Keiretsu Capital
Keiretsu Forum NW
Kirlin
Northwest Partners
Revitalization Partners
Synergy Investments
TapImmune

Notable Alumni

AquaStasis
Cardiac Insight
Life Sciences Discovery Fund
Mirador Biomedical
nLIGHT
Skytap



Developing the future

WRF Venture Center and WRF Research Services

WRF Venture Center offers executive suites to entrepreneurs from a variety of industries. The 15,000-square-foot facility is located just north of downtown Seattle, minutes from I-5 and SR 520. Venture Center tenants benefit from flexible leases, conference room use and light administrative support. In keeping with WRF's focus on supporting local innovation, precedence is given to startups commercializing new technologies developed at Washington state research institutions.

WRF Research Services is operated by Washington Research Foundation's full-time, onsite information specialist. Expertise in patent and trademark research, competitive intelligence, and valuation of technologies and companies provides vital support to the Foundation and WRF Capital. These services are also available to Venture Center tenants, WRF Capital portfolio companies and technology transfer offices within the state.



Washington Research

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Staff

Washington Research Foundation comprises an experienced and accomplished staff and board, with collective expertise in science and medicine, startup operations, venture funding and licensing.

WRF helps to advance entrepreneurship, life sciences and intellectual property in Washington state through board and advisory roles in leading organizations. These include the Alliance of Angels, Fred Hutch, the University of Washington, WBBA and WINGS, in addition to many of WRF Capital's portfolio companies.



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Jeff Eby
Chief Financial Officer



Beth G. Etscheid, Ph.D.
Director of Research
Commercialization



Loretta Little
Managing Director



John Reagh
Managing Director



Kim Emmons
Manager, Research
and Information Services



William J. Canestaro
Manager, Strategic
Investments



Morgan Hellar
Analyst



Dale Wadman
Communications and
Venture Center Manager



Hajir Al-Turfy
Executive Assistant

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Partner, K&L Gates LLP



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Private Investor



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Vice President, Operations
and Compliance Officer,
First Choice Health



Adriane Brown

President and COO,
Intellectual Ventures



Kevin Cable

Managing Director,
Cascadia Capital



Sue Coliton

Partner, Luma Consulting



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Principal Investigator,
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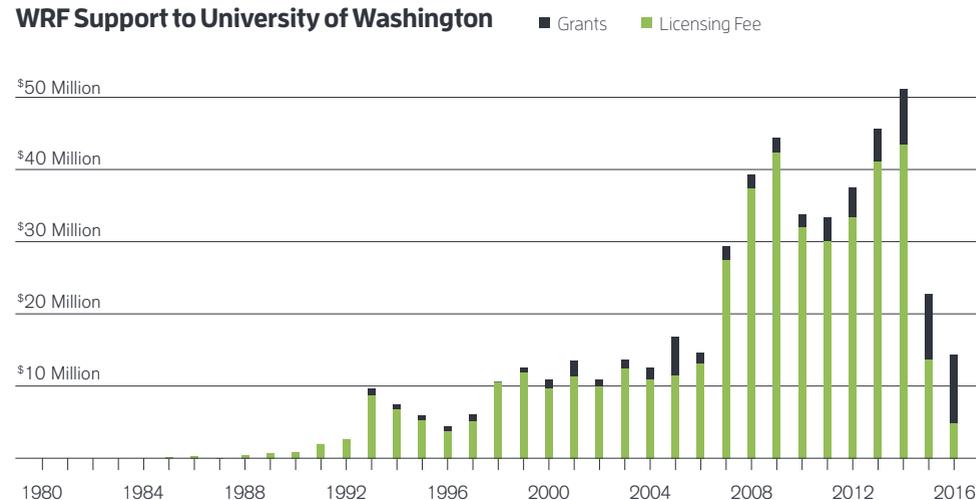
Statement of Financial Position

| Assets | 6/30/12 | 6/30/13 | 6/30/14 | 6/30/15 | 6/30/16 |
|-------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Current Assets | 69,051,625 | 82,415,764 | 72,106,223 | 16,599,799 | 14,566,111 |
| Long Term Assets | 157,280,162 | 194,316,333 | 245,573,384 | 252,990,788 | 230,538,907 |
| Total Assets | 226,331,787 | 276,732,097 | 317,679,607 | 269,590,587 | 245,105,019 |
| Liabilities & Equity | | | | | |
| Liabilities | 56,680,816 | 63,973,864 | 83,049,863 | 25,999,958 | 30,096,051 |
| Unrestricted Net Assets | 169,650,971 | 212,758,233 | 234,629,744 | 243,590,628 | 215,008,968 |
| Total Liabilities/Net Assets | 226,331,787 | 276,732,097 | 317,679,607 | 269,590,587 | 245,105,019 |

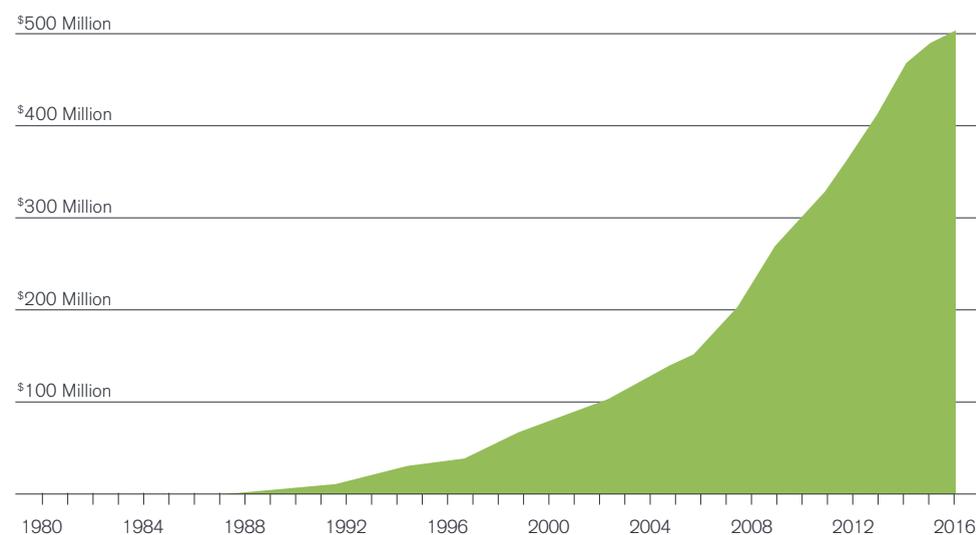
Statement of Activities

| Operating | 6/30/12 | 6/30/13 | 6/30/14 | 6/30/15 | 6/30/16 |
|---|-------------------|-------------------|-------------------|------------------|---------------------|
| Total Royalties and Licensing Revenue | 73,222,390 | 95,397,612 | 76,444,555 | 7,943,859 | 7,575,577 |
| Total Royalty Costs | 51,058,094 | 65,414,682 | 52,080,426 | 6,475,636 | 5,279,584 |
| Net Licensing Income | 22,164,296 | 29,982,930 | 24,364,130 | 1,468,222 | 2,295,993 |
| Operating Expenses | 3,646,534 | 4,074,299 | 4,202,690 | 3,325,296 | 3,536,580 |
| Grants and Distributions Expenses | 8,330,306 | 1,347,150 | 34,534,210 | 1,200,781 | 13,618,467 |
| Change in Unrestricted Net Assets from Operating Activities | 10,187,455 | 24,561,481 | (14,372,770) | (3,057,855) | (14,859,055) |
| Non-operating | | | | | |
| Net Investment (loss) Income | 5,271,640 | 18,545,781 | 36,244,280 | 12,018,740 | (13,709,856) |
| Change in Unrestricted Net Assets | 15,459,096 | 43,107,262 | 21,871,511 | 8,960,884 | (28,568,910) |
| Other Information | | | | | |
| Licensing Fees Paid to UW | 31,816,603 | 41,503,156 | 44,517,210 | 14,155,481 | 4,670,555 |
| Grants Paid | 5,364,526 | 5,389,968 | 7,708,620 | 10,057,970 | 10,117,961 |

WRF Support to University of Washington



Cumulative Support to University of Washington



In addition, UW received stock in Numinous, Ostex and Immersion worth approximately \$10 million as a result of WRF license agreements

WRF grants from 1993 through 2016 totaled

\$66.4 Million



Washington Research

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