AS WE WRAP UP OUR 40TH YEAR,
WE CELEBRATE SOME GREAT MOMENTS
AND LOOK FORWARD TO WHAT’S TO COME

BEST OF 2015

MOTIVATING FACTORS
Our rock-star scientists
open up about what
keeps them going

NUMBERS GAME
From private support
to grants to campus
visitors, the tallies are in

A BRIGHT FUTURE
Hutch strategies and
research capabilities
have never been
more clear

FRED HUTCHINSON CANCER RESEARCH CENTER
DECEMBER 2015
“Let’s get serious about trying to do away with cancer.”

**BOLD IDEAS NEED BIG SUPPORT**

Jay Holman lost his mother to breast cancer when she was only 65 years old. In her memory — and to help fund a cure for cancer — Jay has arranged a gift in his will to Fred Hutchinson Cancer Research Center and established the John H. and Lucille V. Holman Endowment Fund.

[freedhutch.org/tribute](http://freedhutch.org/tribute)

**PAY TO THE ORDER OF:** A legacy gift for future cures

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Thank you for supporting Fred Hutch’s mission to find cures to cancer and give hope to patients everywhere.
THE SIGN OUTSIDE THE LAB IS SIMPLE. It’s a white, 8-by-11-inch piece of paper with black words printed on it. Read what it says and the entire world opens up: “Suddenly, everything is possible.”

For four decades, researchers at Fred Hutch have been refusing to accept limits, working passionately and tirelessly to make the once impossible real. Sometimes it’s a moment that can make the difference — a conversation that sparks a new way of thinking, a visit from someone that launches a partnership, or a discovery under a microscope that changes everything.

These moments happen every day in ways big and small at Fred Hutch. So, as we wrap up 2015, our 40th year, we want to throw open our doors in these pages and invite you in to learn about some of our greatest moments and memories of this year, and to look forward to what’s to come.
Launching new research: Fresh explorations of cancer, HIV and more

We often report on recent, but past, accomplishments. But science is a continuum, with new laboratory experiments underway even as the latest findings go to press. Here’s a sampling of the research kicked off [or soon to launch], thanks to new grant support received this year:

- Breast cancer researcher Dr. Cyrus Ghajar is delving into a new research collaboration to understand how dormant, disseminated breast cancer cells may lead to metastasis, or cancer spread — and how to prevent it — thanks to a new grant from the U.S. Department of Defense.

- HIV researcher Dr. Julie Overbaugh was named a “Director’s Pioneer Avant-Garde Scientist” by the National Institute on Drug Abuse. Her new title also comes with research funding that Overbaugh will use to develop a better laboratory model of HIV infection.

- Transplantation biologist Dr. Rainer Storb received a five-year grant from the National Heart, Lung, and Blood Institute (NHLBI) to improve treatments for patients with congenital immune and blood diseases.

- Gene therapy expert Dr. Hans-Peter Kiem was also awarded a five-year NHLBI grant this year. Kiem, along with the University of Southern California’s Dr. Paula Cannon, will lead a project to study next-generation gene and cell therapies to control and cure HIV.

- Five dairy organizations helped diet and cancer prevention scientist Dr. Mario Kratz launch a study into whether full-fat dairy products may prevent metabolic syndrome, which includes abdominal obesity and high cholesterol.

- Cancer prevention researcher Dr. Polly Newcomb is now investigating a newly recognized and aggressive type of colorectal cancer, thanks to an award from the National Institutes of Health.

Lowering the risk of transplant complications

Dr. Marie Bleakley, a blood stem cell transplant specialist and immunology researcher, reported in June that filtering naive T cells out of a stem cell donation lowered the risk of graft-vs.-host disease, or GVHD, among transplant recipients. The illness arises when donor cells attack the patient’s healthy cells, leading to rashes, vomiting and, sometimes, death.

In a clinical trial at Fred Hutch, among 35 leukemia patients infused with filtered stem cells, only 9 percent showed chronic GVHD, compared with up to 50 percent of those who don’t get filtered stem cells.

Findings from a separate Hutch-based study published this year could also soon help lower the risk of GVHD for patients who receive stem cell transplants at our treatment arm, Seattle Cancer Care Alliance. Mismatches between patients and donors in a tissue-type marker called HLA-DPB1 have long been known to contribute to GVHD risk.
Madame Peng Liyuan, first lady of China, visits Fred Hutch

Madame Peng Liyuan, the wife of China President Xi Jinping, made a historic visit to Fred Hutch in September. Peng, a World Health Organization goodwill ambassador for tuberculosis and HIV/AIDS, met with Fred Hutch President and Director Dr. Gary Gilliland, Bill & Melinda Gates Foundation Co-Chairs and Trustees Bill and Melinda Gates, Nobel Prize–winner Dr. Linda Buck and other key researchers during the one-hour visit. Peng and her delegation also toured a lab where critical HIV vaccine research is being done. “In the future I look forward to more opportunities to work together and contribute shared wisdom on global health challenges,” she said.

A key HIV vaccine clinical trial launches in South Africa

The Fred Hutch–based HIV Vaccine Trials Network in February began a clinical trial in South Africa building on the vaccine from the so-called Thai trial, the first to show modest protection against HIV infection. The 2009 Thai study found that vaccine recipients had a 31 percent lower risk of becoming infected with HIV compared to placebo recipients. The vaccine regimen being tested now has been modified to be more protective and longer lasting. Early next year, researchers will examine whether the new regimen is inducing the expected immune responses and, if so, expand to a larger trial that could lead to the first licensed HIV vaccine.
**New Fred Hutch spinoff commercializes cord blood stem cell therapies**

Dr. Colleen Delaney has seen too many patients suddenly take a turn for the worse after a transplant that was supposed to be lifesaving. To protect them, she developed an umbilical cord blood stem cell product now being commercialized by a new spinoff, Nohla Therapeutics. The company’s launch was announced in December. The product is designed to reduce the risk of complications, such as infections and bleeding, in a wide range of patients, not just those who receive a cord blood transplant.

“No matter where they are, no matter what their [tissue] typing is ... I want this to be something everyone can get,” Delaney said.

**Fighting back against one of the most deadly cancers**

Dr. Sunil Hingorani and his colleagues are advancing toward their goal of saving more lives from pancreatic cancer. This year, the Hingorani Lab discovered a molecular “traffic cop” that seems to control how pancreatic cancers grow and spread. Testing for this molecule could help predict the behavior of a patient’s cancer and help doctors choose the best treatment. One of those treatments could eventually be patients’ own cells. Hingorani and immunotherapy researchers Drs. Phil Greenberg and Ingunn Stromnes found that engineered immune cells killed pancreatic cancer in mice and greatly extended survival. Now, they’re planning a clinical trial of this promising therapy.

**Expanding immunotherapy trials offer hope**

Hutch researchers are harnessing the power of patients’ own immune systems to fight their cancers — even cancers that have proved intractable to many other treatments.

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**Physical fundraising: Thousands hit roads, trails and famous peaks**

To help defeat cancer, Fred Hutch backers logged a world’s worth of hard yards this year — enough, in fact, to circle the planet three times. They collectively pedaled more than 63,000 miles, ran or walked 10,500 miles on city streets and scaled 6,155 miles of mountain. That was the group workload across three annual fundraising events that together raised more than $3 million for ongoing research at the Hutch:

- **OBLITERIDE** — Fred Hutch’s third annual fundraising bike ride included nearly 1,200 riders who traversed, as a group, more than 63,000 miles across Western Washington in early August. The wheeled rally brought in $2.65 million in donations, an Obliteride record.

- **CLIMB TO FIGHT CANCER** — The Fred Hutch event included ascents up six peaks in three countries. Together, 65 climbers scaled 500,000 vertical feet — not counting the descents. To do this, they took a collective 185 personal vacation days from their jobs. And they raised $367,300 to support Hutch research.

- **SHORE RUN/WALK** — At this June event in Seattle, 961 participants ran or walked a 10K, another 1,449 people ran or walked a 5K, and 168 kids completed a half-mile route. All donations and a portion of the event proceeds benefitted the Hutch — a total of $43,000.
This year, scientists have enrolled patients with leukemia, lymphoma, sarcoma and lung cancer into trials of cutting-edge, customized therapies that train immune cells called T cells to home in on and kill their cancer cells. This fall, Hutch scientists also enrolled their first pediatric patient — a girl with leukemia — into one of these trials. As our immunotherapy trials expand, so does the hope they offer to patients of all ages who are out of other treatment options.

**Tumor Paint reaches clinical trial for children with brain cancer**
A molecule derived from scorpion venom that illuminates cancer cells is getting its first test on brain cancer. Enrollment launched in June for a Phase 1 clinical trial of “Tumor Paint,” BLZ-100, developed by Blaze Bioscience based on technology licensed from Fred Hutch, Seattle Children’s Hospital and the University of Washington. The trial, at Seattle Children’s, is open to infants and patients up to age 30. The promise of Tumor Paint — invented by Fred Hutch researcher Dr. Jim Olson — is better detection and surgical removal of solid tumors without harming healthy tissue.

**A block party and a good time for all**
What better way to celebrate 40 years of cures than to throw a block party? We did, and more than 1,000 neighbors and Fred Hutch family members dropped in for a festive September afternoon. There were food trucks, games and prizes, and a science fair with exhibits staffed by our own researchers. The Mariner Moose, the mascot of Seattle’s Major League Baseball team, came by to meet kids of all ages; and guests could take a walk through CASPER, the colossal inflatable colon, for a hands-on lesson about colon cancer prevention.

**Fred Hutch’s HIV research featured in HBO VICE documentary**

Dr. Larry Corey, president and director emeritus and principal investigator of the Hutch-based HIV Vaccine Trials Network, described the “explosion of knowledge” that is offering hope of a licensed HIV vaccine and an AIDS-free generation.

Vaccine and Infectious Disease Division Director Dr. Julie McElrath explained the workings of the HVN laboratory, which she oversees, and introduced Rod Fichter, a volunteer in her long-running study of people who are infected with HIV but whose bodies control the virus without medication.

HBO’s correspondents traveled to South Africa to interview the HVN’s Dr. Glenda Gray, who oversees vaccine clinical trials in the region hardest hit by the pandemic. The program also featured Timothy Ray Brown, the only person known to be cured of HIV, and Dr. Gero Hütter, the German doctor who cured him. In February, both visited Hutch-based defeatHIV, a research consortium that is using Brown’s case as a blueprint for genetically engineering a cure.
Hutch Holiday Gala turns 40, breaks $100 million
Seattle’s premier black-tie event began as a small dinner party in 1975, hosted by the Grace Heffernan Arnold Guild to honor its namesake. Today, the Hutch Holiday Gala is the largest Fred Hutch fundraising event of the year and one of the most successful of its kind in the country.

Over four decades, our Gala benefactors have poured an incredible amount of support into lifesaving research. This year, the cumulative total raised at this event passed the $100 million mark — a stunning milestone in funding for work that impacts lives around the world.

New technique to pinpoint randomness of life — and disease
Drs. Roger Brent and Alexander Mendenhall have developed a method to see and measure how genes turn on and off in single cells in a living animal — and to track that activity through the animal’s life. This is the first time a gene’s activity has been...
reproducibly measured in a live adult animal — the microscopic roundworm Caenorhabditis elegans. The scientists will use the technique to study how molecular randomness contributes to physical differences — or disease — in organisms with the same underlying genetics. For example, not all women with cancer-associated mutations in BRCA1 and BRCA2 develop breast cancer, but it’s not clear why.

Dr. Gary Gilliland becomes Fred Hutch’s new president and director
Renowned physician-scientist Dr. Gary Gilliland became Fred Hutch’s new president and director when he took the helm on Jan. 2. His curriculum vitae is bursting with accomplishments: 20 years on the faculty at Harvard; a Howard Hughes Medical Institute investigator; director of the leukemia program at the Dana-Farber/Harvard Cancer Center; senior vice president and global oncology franchise head at Merck Research Laboratories; vice dean and vice president of precision medicine at Perelman School of Medicine at the University of Pennsylvania. But for Gilliland, all of it comes down to a passion for finding cures for patients. Fred Hutch is poised to do that, he said. “Everything I’ve done in my career has pointed here.”

Uganda celebrates the opening of UCI-Fred Hutch Cancer Centre
The Uganda Cancer Institute and Fred Hutchinson Cancer Research Center in May opened a new, state-of-the-art home for their decade-long alliance. The UCI-Fred Hutch Cancer Centre for the first time brings all of the alliance’s work under one roof, accommodating 20,000 outpatient visits a year as well as housing laboratories for research and rooms for training and conferences. It is the first comprehensive cancer center jointly built by U.S. and African cancer institutions in sub-Saharan Africa. The celebration in Kampala included dancers from every corner of the country and speeches by dignitaries, including Uganda President Yoweri Kaguta Museveni.
Gene therapy trial offers new hope in Fanconi anemia
This summer, a 10-year-old boy named Behzad Hathiram traveled from India to Fred Hutch to become the first child in the U.S. to receive a new gene therapy for Fanconi anemia. A faulty gene causes this inherited blood disorder, which can lead to cancer and early death.
In this trial, the research team is using a modified version of HIV to insert a functional copy of the defective gene into participants' marrow cells. After reinfusion, the hope is that the corrected cells overcome the inherited defect. "The goal is to, eventually, cure the patient," said investigator Dr. Hans-Peter Kiem.

Donor meets her match at Bone Marrow Transplant Survivor Reunion
A tear-evoking embrace entwining a Canadian mom and a Tacoma, Washington, toddler capped the seventh Bone Marrow Transplant Survivor Reunion — offering a precious glimmer of the Fred Hutch-pioneered science that’s impacted millions of lives.
At the July 25 event, marrow donor Pam Dicaire grasped the meaning of her gift. After traveling 3,500 miles from New Brunswick, she met and scooped up her stem cell recipient, Savanna Acosta. Born with a severe immune disorder, Savanna, 2, now is healthy. Dicaire cried and smiled, as did many in the crowd of several hundred who attended the Hutch-hosted celebration at Seattle’s Museum of History & Industry.

Base 2 Space raised emotions — and a half million dollars
A spiraling line of nearly 1,200 people trudged 52 stories skyward during the Base 2 Space Climb in October, raising more than $500,000 for cancer research at Fred Hutch.
The first year of the Space Needle event drew cancer survivors, the family members of cancer patients who’ve died and folks who simply wanted to scale an iconic monument in the name of eradicating a disease. Participants came from 21 states and two Canadian provinces. The open-air ascent covered 832 stairs. Each participant had to raise at least $250. The top 10 fundraisers get to walk the Needle’s "halo," the outermost ring, in April.

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‘I’m here because …’

Fred Hutch researchers share what motivates them

BY FRED HUTCH STAFF

THE REASONS A SCIENTIST spends countless hours pursuing potential cures or ways to prevent cancer are myriad as cells in the body. For some, it’s simple curiosity. For others it’s the challenge of solving a seemingly impossible problem. Some want to use their lives to change the world. For others, it’s also deeply personal.

“We’re here because we want to contribute to the cure! And one of us is benefiting from it!”

“I’m here because improving outcomes of treatments for children and adults with leukemia matters to me.”

“I’m here because I want do my part in making cancer a thing of the past.”

Our newly opened Visitor Center, located in the lobby of the Robert M. Arnold Building on our Seattle campus, showcases the life-changing work happening at Fred Hutch. But it also gets to the heart of why we do what we do by inviting those whose lives have been touched by cancer or other life-threatening diseases to use our interactive photo kiosk and share how these experiences have affected their lives.

On the curving walls are hundreds of photos with messages left by patients, family members, researchers and others that encourage, inspire or remember. They wrap around the room like an embrace, each telling its own story.

On the next few pages, you’ll see some of the photos made by our researchers, learn about their work and read why they are at Fred Hutch.

Top photo by Fred Hutch’s Robert Hood; all others courtesy of Studio Matthews
THOMPSON STUDIES GROUP
PUBLIC HEALTH SCIENCES DIVISION

The Health Disparities Research Center, under the direction of Dr. Beti Thompson, works to reduce the unequal and unjust burden of cancer in African Americans, American Indians and Alaska Natives, Asians, the elderly, Hispanics and Latinos, LGBTs, Native Hawaiians and Pacific Islanders, people of low socioeconomic status, people with disabilities and rural populations — all groups more likely to be diagnosed with late-stage disease and/or die from preventable cancers that might have been detected with early screening. Fred Hutch is currently conducting projects on breast cancer screening and prevention, childhood obesity, cancer screening, smoking cessation, HPV vaccination and more.

DR. COLLEEN DELANEY (AND HER SON, IAN)
CLINICAL RESEARCH DIVISION

Dr. Colleen Delaney founded Fred Hutch’s Cord Blood Program in 2006. Cord blood offers a lifesaving option to the thousands of patients each year who cannot find a matched adult donor of blood-forming stem cells for transplant. By developing a technique to multiply the number of blood stem cells in each unit of cord blood, Delaney and colleagues made cord blood a viable alternative to adult bone marrow. This advance also led to her team’s development of an off-the-shelf expanded cord blood product that can provide patients with infection-fighting cells while their immune systems recover from transplant or chemotherapy.

To learn more about Fred Hutch’s Visitor Center, go to fredhutch.org/visitorcenter
Since 1982, Dr. Andrew Taylor has been a staff scientist in Dr. Gerald Smith’s lab, studying the machinery cells use to repair damaged DNA. For most of that time, Taylor worked near his wife of 30 years, Dr. Meg Holmes, who died in 2011 of the brain cancer glioblastoma. Also a longtime Hutch scientist, Holmes uncovered the 3-D structures of proteins, including certain antibodies crucial to many modern therapies — such as the treatment Holmes herself received during a clinical trial for her cancer. Despite the progress in cancer research Taylor has seen in his lifetime, the years he spent by Holmes’ side as she lived with her disease and went through treatment made him realize how far there is to go to overcome some cancers.

Under Dr. Julie McElrath, a global leader in HIV/AIDS vaccine and human immunology research, the McElrath Lab focuses on how infection-fighting T cells contribute to the control of HIV. The lab has identified some of HIV’s key mechanisms, including long-running research on the genetics of rare HIV-positive people who can control the virus without treatment. Lab members also develop tests to predict the effectiveness of potential HIV vaccines before they move on to clinical trials so that resources can be focused on the most promising candidates. McElrath, who is a Fred Hutch senior vice president and director of the Vaccine and Infectious Disease Division, is the principal investigator and director of the laboratory center for the HIV Vaccine Trials Network.
Scientists in the Henikoff Lab, which is led by geneticist Dr. Steve Henikoff, study epigenetics, the collection of techniques cells use to change their genes’ activity. Like the other lab teams who share their neighborhood in Fred Hutch’s Basic Sciences Division, Henikoff Lab researchers want to understand how cells work at their most fundamental level — with the ultimate goal of better understanding what happens when those fundamentals go awry, as in cancer. Along the way, Henikoff and his team have also invented many computational and lab techniques that are now widely used by other research groups.

To submit your story online or read others, go to fredhutch.org/myStory
2015

BY THE NUMBERS
With just 365 days to celebrate 40 years of cures at Fred Hutch, we’ve been making each one count

BY FRED HUTCH STAFF

CURES START HERE
Hutch researchers received funding to launch more than

244
NEW PROJECTS

46
Federally funded or privately funded pilot studies

11
Fellowships and mentored training awards, which support postdoctoral researchers as they transition from trainee to independent investigator

RESEARCH FINDINGS PUBLISHED
Scientific papers published by our research teams, as of Dec. 4.

1,922

WELCOME TO CAMPUS
People stopped by our Seattle campus to help us celebrate our 40th year at events like our block party and our seventh Bone Marrow Transplant Survivor Reunion.

1,500+

PEOPLE POWER
Fred Hutch in the last year

7
New faculty members joined

212
Total faculty members

2,695
Total employees

RECORD-BREAKING PRIVATE SUPPORT
In fiscal year 2015 (July 1, 2014, through June 30, 2015), 32,727 benefactors made 52,983 gifts, ranging from $1 to $10 million, to fuel our groundbreaking research. This includes almost $13 million from more than 70 individuals through their wills, trusts or other planned gifts.

$56,294,920
Burke Tinsley, a 17-year-old brain cancer survivor, shared his story, his thoughts on cancer research and his inspiring perspective on self-determination.

Encouraging results from a Hutch lab-based study of immunotherapy for pancreatic cancer resonated with our crowd.

Back in January, long before he and his fellow Kansas City Royals won the World Series, Alex Gordon came to Seattle to accept the 2015 Hutch Award and visit our campus.


Except as noted, data are from Jan. 1, 2015, through Oct. 31, 2015.
IT IS WITH GRATITUDE AND DELIGHT that I write this last President’s Letter of Fred Hutch’s 40th year. What a year it has been.

When I arrived at the Hutch, just in January of this year, I knew that I was joining an organization populated with world-class scientists doing lifesaving research. My personal connections with the people and the place made it feel a bit like coming home. And the year did not disappoint.

In this magazine, we started the year with a 40th anniversary commemorative issue in which we looked back at 40 things, big and small, that have happened over the decades to make Fred Hutch what it is. In this issue, the last of 2015, we celebrate what took place this year — a momentous anniversary year filled with scientific advances, individual recognitions and center-wide firsts.

As you learned about the researchers in these pages and about just how much we have moved forward this year, I’m sure it was clear that our mantra, “Cures start here,” is embodied in everything we do. Because, we mean it: We are not here just to treat cancer and related diseases. We have been working, every day of our 40 years — and now as we launch into our 41st — to find cures. We have developed stem cell transplantation as a curative therapy for certain types of blood cancers. During the next 10 years, in time for our 50th anniversary celebration, we aspire to apply what we are learning about cancer biology and our immune system to develop curative therapies for most if not all cancers. It is a bold and provocative goal — but the innovation happening right now is finding those answers, those curative therapies. Most of us have worked our entire careers to stand on this precipice.

Our community has also never been so strong. It is fitting that in a year with record-breaking fundraising from you, we also invited the community to join us in new ways. So many of you came to campus this year, to learn, to share, to be a part of something. And now we have a place for you to visit and share your own story: our recently opened Visitor Center, right here on campus in the Arnold Building. Please come and visit, anytime.

You are why we are here, after all.

As the calendar turns to 2016, we know there is so much more to come. Our scientific strategies and research capabilities have never been more clear. We look forward to sharing all of that with you in the coming months and years.

Cures start here,

Dr. Gary Gilliland
President and Director
“I’ll remain a cancer patient until I die of my disease. That is, unless the great folks at Fred Hutch find me a cure. They can’t do it without you, so please consider a gift today.”

**BOLD IDEAS NEED BIG SUPPORT**

Help ensure 40 more years of cures at Fred Hutch. Give today and your gift will be matched dollar for dollar.

*fredhutch.org/give*

**PAY TO THE ORDER OF:**  

_Curing cancer faster_

**GIVE TODAY AND YOUR GIFT WILL BE MATCHED DOLLAR FOR DOLLAR**
Congratulations!

Fred Hutch faculty, programs and our president won a number of prestigious scientific awards this year. We want to recognize some of them here:

Dr. Sue Biggins, a geneticist and biologist in the Basic Sciences Division, was selected as a Howard Hughes Medical Institute investigator and was elected to the National Academy of Sciences.

Dr. Linda Buck, a Nobel Prize-winning neurobiologist in the Basic Sciences Division, was elected to the Royal Society, the United Kingdom’s national academy of science.

Dr. Gary Gilliland, president and director of Fred Hutch and an expert in cancer genetics and precision medicine, was elected to the National Academy of Medicine (previously known as the Institute of Medicine), one of the highest honors in health and medicine.

The Women’s Health Initiative, a nationwide study coordinated by Fred Hutch under the leadership of Dr. Garnet Anderson, won the 2015 Team Science Award from the Association for Clinical and Translational Science.