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## PROGRESS UPDATE

### The Pan-Mass Challenge

*Fall 2017*



Dana-Farber Cancer Institute has been the top ranked cancer hospital in New England by U.S. News and World Report for 17 consecutive years, and is the only cancer center in the country ranked in the top 4 for both adult and pediatric cancer programs.

## PAN-MASS CHALLENGE: HITTING A HIGHER GEAR IN THE FIGHT AGAINST CANCER

For nearly four decades, the Pan-Mass Challenge (PMC) and Dana-Farber Cancer Institute have led the charge against cancer through a partnership unlike any other. Under the leadership of Founder and Executive Director Billy Starr, the PMC has raised more than \$598 million for cancer research and care at Dana-Farber since 1980, including a record \$51 million in 2017. The largest athletic fundraiser in the country, the PMC has developed into a model of fundraising efficiency, with 100 percent of every rider-raised dollar supporting Dana-Farber's lifesaving mission.

The PMC's remarkable success is propelled by a culture of commitment among a dedicated community of cyclists, volunteers, staff, corporate sponsors, and individual donors. Rider retention rates are 78 percent, with participants raising an average of \$7,900 each. In 2017, 6,200 cyclists from 40 states and 7 countries chose to ride one of 12 routes, cycling between 25 and 192 miles. More than 4,000 passionate volunteers helped the ride run smoothly by unloading cargo from trucks, organizing luggage, distributing water, and preparing meals. Approximately 850 PMC Living Proof® riders and volunteers participated in 2017.

Thanks to its many valued supporters, the PMC has grown into the Institute's largest single contributor, providing Dana-Farber's renowned physician-scientists and dedicated staff with the resources they need to pursue revolutionary discoveries and shape the future of patient care. The PMC's impact increases with every ride, and all of us at Dana-Farber greatly appreciate this important partnership.

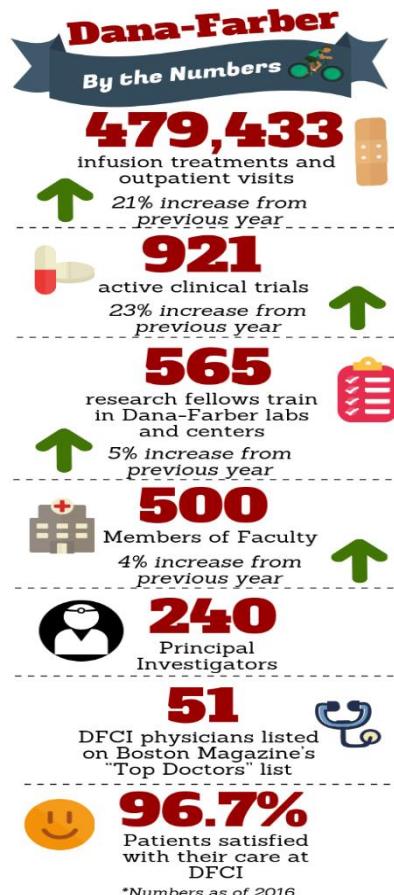


## **PMC IMPACT: RESOURCES TO PROPEL UNPRECEDENTED PROGRESS**

Like the PMC, Dana-Farber leads at the cutting edge of excellence in the fight against cancer, setting and surpassing lofty benchmarks for success. Situated at the helm of the world-class Dana-Farber/Harvard Cancer Center, the Institute is ideally positioned to propel progress against this disease on a local, national, and global scale. The PMC plays an integral role in driving this engine of innovation, providing a lifeline of flexible funds that may be agilely applied where they make the greatest impact for those we serve.

Bolstered by PMC support, Institute physician-scientists are uncovering cancer's genetic causes and translating these insights into precision therapies. They are leveraging extensive collaborations to accelerate discoveries and translate pivotal breakthroughs into better treatments. They are delivering compassionate, comprehensive care tailored to the needs of each patient. And they are working in the best facilities with the latest technologies.

The PMC remains a crucial catalyst for this important work, elevating Dana-Farber's efforts across a broad spectrum of strategic imperatives.



## PMC IMPACT: INVESTMENT IN EXCELLENCE AT EVERY LEVEL



**Precision Medicine** – PMC funding has helped launch Dana-Farber to the forefront of the precision medicine revolution, in which cancer treatments are targeted to the specific genetic mutations of a patient's tumor. With support from the PMC, the Institute is building one of the world's most comprehensive databases of patient tumor data, providing an invaluable resource for research and drug development.



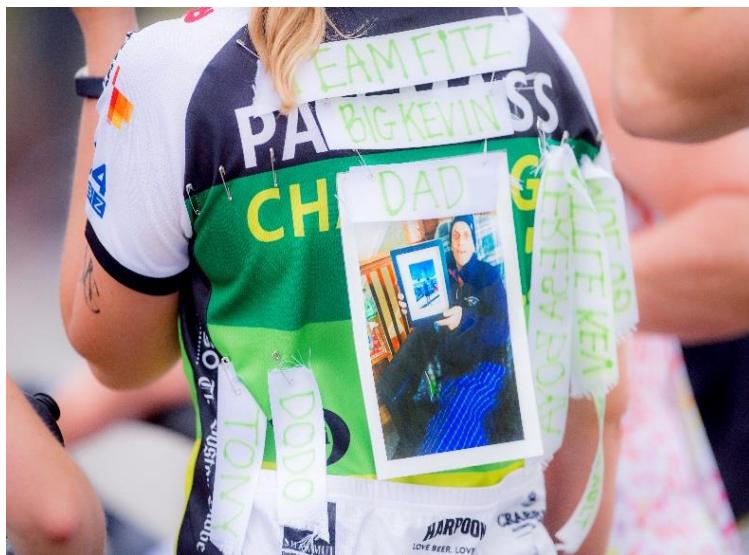
**Groundbreaking Research** – The PMC enables the Institute to pursue the boldest research ideas and translate the latest discoveries into better treatments for patients. Emboldened by the commitment of the PMC community, our investigators are accelerating the pace of progress on multiple fronts and setting new standards in patient care.



**Comprehensive and Compassionate Care** – PMC support ensures ongoing delivery of the highest quality programming for patients and families, many of which are not covered by insurance. Thanks to the PMC, our clinicians and staff can provide exceptional care without compromise to the people they serve.



**State-of-the-Art Facilities** – PMC investment is propelling strategic enhancements across Dana-Farber campuses that have strengthened and expanded the Institute's capacity to pursue its lifesaving mission. Bolstered by PMC resources, our renowned physician-scientists are well-equipped to take cancer medicine to a higher level locally, nationally, and throughout the world.



## PMC IMPACT: LEADERSHIP IN PRECISION MEDICINE

Precision medicine is a promising field in which researchers are uncovering new information about the genetic and molecular characteristics of cancer and other diseases to find more effective and less toxic treatments. With PMC support, Dana-Farber has emerged as a leader in cancer precision medicine, pioneering the use of genomic technologies in the clinic and paving the way for the development of more targeted cancer therapies.

In 2011, Dana-Farber embarked on the broadest and most comprehensive patient-based genomics project in the world. From its inception, *Profile*'s vision was remarkably ambitious: Every patient who came to Dana-Farber, Brigham and Women's Hospital, and Boston Children's Hospital for cancer treatment would have the opportunity to have his or her tumor analyzed for known cancer-causing genetic mutations. Results from these tests would be matched to the appropriate patient's clinical data so that physicians could learn how different tumor mutations influence treatment outcomes and tailor treatments with targeted therapies that counter the specific mutations driving each patient's tumor.

*Profile* has already yielded a massive collection of data. More than 50,000 patients have consented to participate in the project, and researchers have analyzed genomic tests on more than 17,000 tumor specimens. In its most recent iteration, *Profile*'s genomic technology platform, called OncoPanel, detects mutations in more than 400 cancer-associated genes, generating a detailed snapshot of the genomic landscape in every tumor. Propelled by PMC support, this project is growing and making an even greater impact on cancer research and treatment.

### Profile

One of the most comprehensive patient-based cancer genomics projects in the world

Since Profile's inception in 2011:



More than  
**50,000**  
patients  
have  
participated



OncoPanel, the  
project's  
technology  
platform, can  
detect mutations  
in nearly  
**400**  
cancer-  
associated genes



Researchers  
have  
analyzed  
more than  
**17,000**  
genomic  
profiles of  
patient  
tumors

#### IDENTIFYING DRIVER MUTATIONS



Through this research project, patients  
can have their tumor analyzed for the  
presence of cancer-causing abnormalities

#### CLINICALLY ACTIONABLE RESULTS



Approximately 30 percent of participants  
in Profile (60 percent since the change to  
OncoPanel) have had "clinically actionable"  
test results that can help their doctors  
choose the most effective therapy, suggest  
appropriate clinical trials of new  
treatments, and establish clear diagnosis  
and prognosis when otherwise uncertain.

## PMC IMPACT: GROUNDBREAKING RESEARCH IN PURSUIT OF CURES

The PMC provides critical seed funding for Dana-Farber's most innovative science, empowering our physician-scientists to advance creative approaches to an array of pressing challenges in cancer medicine. Bolstered by PMC support, our investigators continue to make discoveries that revolutionize patient care, as evidenced by the following recent examples:

- ❖ **Drug development** – Over the past year, Dana-Farber researchers have demonstrated the promise of the first potential targeted drug for use against triple-negative breast cancer and advanced novel immunotherapies for treating glioblastoma.
- ❖ **Immuno-Oncology** – Dana-Farber investigators are spearheading research to analyze and assess the interactions between the immune system and cancer in order to determine which immunotherapy strategies are likely to benefit specific patients. This work is being expanded into an Institute-wide initiative called Immuno-Profile, which is expected to launch in early 2018 as the first program in the country to routinely offer comprehensive immune system analysis to all interested patients.
- ❖ **Basic Research** – Investigators in Dana-Farber's Cancer Chemical Biology Program identified the relationship between the BRCA1 gene and R-loops—cellular structures that can be prone to cancer-causing genetic damage—as well as the role this interaction may play in driving the formation of breast cancer cells. These findings could potentially serve as the basis for novel treatment strategies for patients.

### National Impact in Pursuit of Cures

Recent groundbreaking FDA drug approvals propelled by research led at Dana-Farber

**Nivolumab**  
(Melanoma and Hodgkin Lymphoma)  
Immunotherapy that achieved "breakthrough" status for remarkable responses in treatment-resistant patients

**Pembrolizumab**  
(Advanced Melanoma)  
First PD-1 inhibitor approved in the US

**Olaparib**  
(Advanced Ovarian Cancer)  
First new drug approved for ovarian cancer in nearly a decade

**Osimertinib**  
(Lung Cancer)  
Fastest cancer drug ever developed

**Panobinostat**  
(Multiple Myeloma)  
First targeted therapy for HDAC mutation approved for treating MM

\*\*\*Other notable approvals: venetoclax and midostaurin (acute myeloid leukemia), ramucirumab (advanced stomach cancer), idelalisib (chronic lymphocytic leukemia), and daratumumab (multiple myeloma), among others.

## PMC IMPACT: UNPARALLELED PATIENT-CENTERED CARE

Thanks to funds raised by the PMC, Dana-Farber is providing comprehensive, compassionate care addressing the full spectrum of patient and family needs—physical, emotional, and psychological. PMC investment also enables the Institute to alleviate healthcare disparities by bringing critical initiatives and services directly into local neighborhoods so surrounding communities have access to the latest cancer information and receive the best care. Programming supported by the PMC includes the following:

- **Palliative care teams** that are embedded on several floors of the Yawkey Center for Cancer Care where patients often present with challenging symptoms and quality of life concerns stemming from their cancer treatment. In this new model, palliative care clinicians see patients directly with their oncologist or in one-on-one sessions.
  - The **Mammography Van**, a centerpiece of the Institute's commitment to connect minority and low-income women with breast cancer prevention and care, which has provided more than 41,000 mammograms to more than 18,000 women since 2002.
  - A **groundbreaking human papillomavirus (HPV) outreach and mobile vaccination program** for Boston high school students to explain the safety and effectiveness of HPV vaccination in preventing cervical, oral, and other cancers.
  - The **Patient and Family Assistance Program** which provides critical need-based financial support, legal assistance, and educational resources to patients and families facing financial hardship.
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- The graphic features a stylized globe with green continents and blue oceans. A dark blue ribbon banner wraps around the middle of the globe, containing the text "Dana-Farber's Global Impact" in white. Small white clouds are scattered around the globe.
- Trained and mentored medical teams in the Dominican Republic, Egypt, Haiti, Mexico, Myanmar, and Rwanda with a focus on oncology.
  - Supported opening of new pathology departments in Haiti and Rwanda to accelerate diagnosis and treatment by speeding the processing of patient tissue samples.
  - Provided technical expertise for medical record-keeping and information systems in Haiti and for cancer registry projects in El Salvador and Guatemala.
  - Launched first pediatric oncology psychosocial program in Armenia and nursing education program in Tanzania.
  - Advanced research and nurtured the growth of oncologists from around the world as leaders in their fields through the Institute's renowned fellowship programs.

\*\*\*Sources: reports on Dana-Farber's Pediatric Global Health Initiative and Center for Global Cancer Medicine

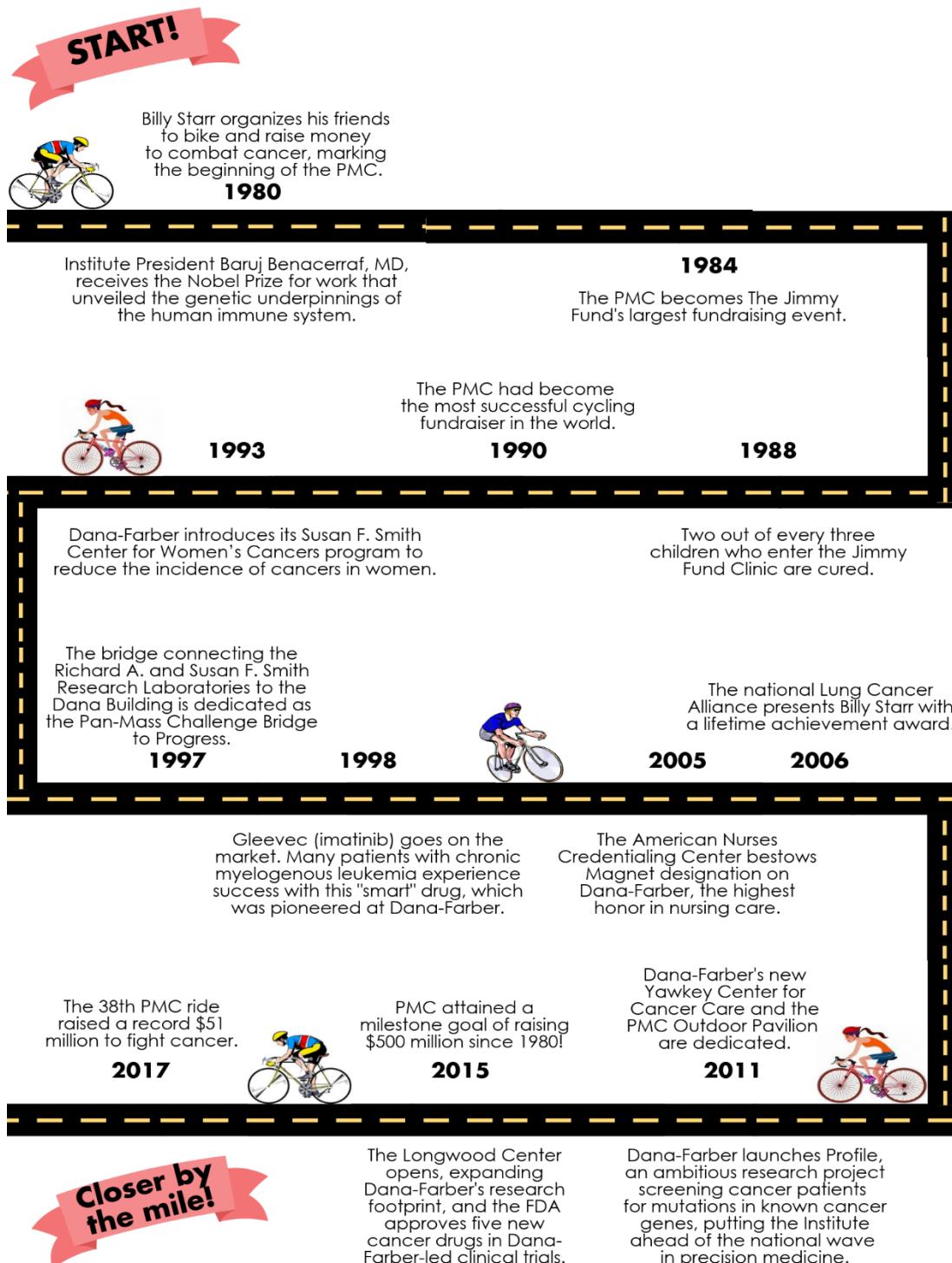
## PMC IMPACT: STATE-OF-THE-ART FACILITIES

Dana-Farber's leadership in cancer medicine requires the brightest minds working in the best facilities with the latest equipment. To that end, the PMC has been instrumental in helping to enable an array of critical campus enhancements that have dramatically expanded and elevated the Institute's scientific and clinical capabilities. Recent capital projects include the following:

-  **Longwood Center** – A hub of creative, collaborative, and cutting-edge research, the Longwood Center provides the ideal environment for accelerating innovative investigations and advancing groundbreaking cancer therapies. With support from the PMC, its excellence grows, as the laboratory space at the Center continues to undergo optimization to maximize efficiency and productivity. Most recently, a new vivarium was added to consolidate animal housing from across Dana-Farber's campuses in one location. Additionally, laboratories on the building's third and ninth floors were customized and fitted for research teams in cancer chemical biology and biostatistics.
-  **Leonard P. Zakim Center for Integrative Therapies and Healthy Living** – Founded in 2000, the Zakim Center exemplifies Dana-Farber's commitment to providing support for the "whole person" during and after treatment. Fueled by PMC funding, the Center was recently relocated to a new dedicated facility featuring a 30 percent expansion in space, increased accessibility within the Institute and the centralization of staff. Opened in June 2017, the new Center enables Dana-Farber to meet a rapidly growing demand for its comprehensive services aimed at improving patient quality of life and outcomes, including acupuncture, expressive arts therapies, integrative medicine and nutrition consultations, massage, meditation and mindfulness, and movement and other exercise programs.



## PMC IMPACT: 38 YEARS OF RECORD-BREAKING COMMITMENT



## PMC IMPACT: \$598 MILLION RAISED...AND THE MOMENTUM CONTINUES!

The PMC's impact on Dana-Farber cannot be overstated. With more than \$598 million raised since the first ride in 1980, the PMC has empowered the Institute to make remarkable strides on multiple fronts—advancements that would not have been possible without such incredible support. Looking ahead, the opportunities to propel progress against cancer have never been greater, and funding from the PMC enables Dana-Farber to pursue them. At this moment of unprecedented potential, the Institute depends on the PMC more than ever to move the needle forward in our shared fight, and we are deeply grateful to this committed community for its tremendous partnership.



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## FOR MORE INFORMATION

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