

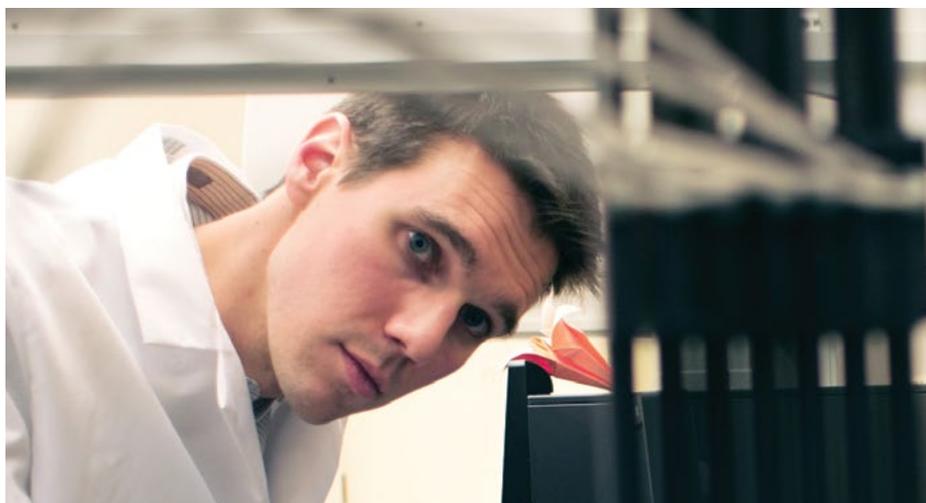
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19

YEAR
IN
REVIEW

Research Progress



THE MICHAEL J. FOX FOUNDATION
FOR PARKINSON'S RESEARCH



2019 ACTIVITIES
BY THE NUMBERS

\$90 MILLION

*in research grants funded
and being carried out at*

200

research institutions in

22 COUNTRIES

around the globe



2019 marked a year of momentous progress in Parkinson's research.

The pipeline of potential treatments continues to grow and diversify. The Michael J. Fox Foundation's comprehensive research strategy prioritizes moving treatments forward as quickly as possible. But we also know that when the next breakthrough comes, it will be because patients, families, researchers and industry partners are working together. We are all part of the answer.

Visit michaeljfox.org/yearinreview to learn more about the projects described throughout.

A Robust Pipeline of Treatments Toward a Cure

MANY OF THE LEADING TARGETS FOR DRUGS THAT MAY SLOW OR stop Parkinson's disease (PD) come from studying genes. Finding genetic differences in people with Parkinson's points scientists to what is going wrong in the cell and how they may intervene to stop it. Today, more therapies against genetic targets are in human trials, and researchers are learning more about whom these treatments may help. Scientists are increasing the likelihood of success by taking varied approaches and testing different ways to stop dysfunction in leading genetic targets alpha-synuclein, LRRK2 and GBA.

The protein alpha-synuclein was the first target linked to rare genetic mutations in certain families. Scientists have since discovered that nearly all people with PD show signs of abnormal alpha-synuclein activity. Today, there are 11 alpha-synuclein therapies in human trials, some supported directly by The Michael J. Fox Foundation (MJFF).

The Foundation also has stepped in to drive progress on LRRK2. The Foundation funded and spearheaded an unprecedented collaboration among competitors to prove that testing drugs against LRRK2 is safe. Now, several companies are in, or close to, LRRK2 human trials. San Francisco biotech Denali is testing LRRK2 therapies in people with

Parkinson's, with and without a LRRK2 mutation. Biogen also has a LRRK2 treatment in the clinic and others are moving closer.

MJFF also has long supported therapies targeting dysfunction associated with a GBA gene mutation. Mutations in this gene increase the risk of PD and are more common in people of Ashkenazi Jewish descent. Four therapies against the GBA pathway are in human trials, and MJFF-supported scientists are investigating dysfunction in this pathway in people without this mutation.

“I’m absolutely sure we are on a path to answer the questions about what causes Parkinson’s and how to cure it.”

Michael J. Fox
Bloomberg, January 2019

While these treatments move through clinical trials and closer to patients’ hands, the Foundation is continuing to seed the pipeline with more opportunities. Scientists are looking for treatments against emerging genetic targets such as the parkin and PINK1 proteins.

More Options for Managing Parkinson’s Symptoms Are Market-bound

People with Parkinson’s experience a range of symptoms. It’s critical that we have effective treatments for every symptom in order to improve day-to-day disease management for every individual. And we are making significant strides toward that goal.

This summer, the U.S. Food and Drug Administration (FDA) approved another drug for the treatment of “off” episodes — when symptoms return between medication doses. Nourianz (istradefylline) blocks the brain chemical adenosine to boost the signaling of dopamine — a different mechanism from currently available Parkinson’s drugs. Nourianz joins Inbrija (inhaled levodopa) and Apokyn (injected apomorphine) as treatment options for “off” episodes. Yet another option, an under-the-tongue strip of apomorphine, is currently under



SINCE 2014

14

NEW TREATMENTS

for motor and non-motor symptoms of Parkinson’s have crossed the development finish line and received

FDA APPROVAL

popular topic in recent years. Right now, three trials are targeting the cannabinoid receptor in Parkinson’s, which could lead to new treatment options that address multiple symptoms.

FDA review. And more than two dozen other therapeutics for motor symptoms including dyskinesia, tremor, and gait problems are in human studies.

While motor symptoms are most closely associated with Parkinson’s, non-motor problems can be even more troubling. Treatments for non-motor issues including cognition, sleep, constipation, saliva production and psychosis also are advancing through late-stage clinical trials. In September, the FDA approved Myobloc for chronic or excessive salivation, which can lead to drooling. In addition, medical marijuana has been a



Parkinson's Progression Markers Initiative:

MJFF's Landmark Study Speeds Discovery

THE MICHAEL J. FOX FOUNDATION'S (MJFF) LANDMARK CLINICAL study, the Parkinson's Progression Markers Initiative (PPMI), has built the most robust data and biospecimen library in Parkinson's research history.



Following nearly 1,400 participants at 33 clinical sites, the international study launched in 2010 with a mission to identify biomarkers of Parkinson's disease (PD) onset and progression. Biomarkers are ways to measure biological processes of diseases in our bodies, as blood pressure does in heart disease. Today PPMI is the most important study in PD research. Approaching its tenth year, the study's impact is felt in many areas of research, including scientific results, standardization, collaboration and trial design. PPMI is

influencing the future of Parkinson's research and pushing the field closer to better treatments, and a cure.

In Pursuit of a Biomarker to Revolutionize Diagnosis and Drug Development

Scientists are combing PPMI data for differences in disease, which could point to potential biomarkers and, possibly, therapeutic targets as well. Measuring what is wrong may help diagnose or track Parkinson's; fixing what is wrong could treat it.

This year PPMI released data from its RNA Sequencing Project, which could be the source of unprecedented insights into how gene expression changes over time in people with Parkinson's. At 108 terabytes — the equivalent of 47.5 billion single-spaced typed pages or 9,059,697 phonebooks — the project is the largest disease-focused data set ever created. Combined with other data collected from studies sponsored by the Foundation, this project can illuminate the genetic drivers of Parkinson's and the underlying mechanisms that lead to the development and progression of the disease. Researchers may also use the data set to explore how gene activity can impact symptoms or medication effects. Analysis of this data can help the field better understand Parkinson's, its variability, and ways to measure and treat it.

Another approach to measure Parkinson's disease is with brain imaging. PPMI findings have led to widespread use of DAT scans, which measure dopamine activity, in research. Now study data is showing another scan (VMAT) may be more sensitive in measuring the same thing. MJFF is funding a sub-study to compare DAT and VMAT, which could optimize study designs. PPMI also is following up on previous findings from the study that indicated subtle changes in an area of the brain called the nucleus basalis of Meynert may predict cognitive decline. Such a tool could help select participants for studies to better understand and treat this symptom.



MORE THAN

4.8 MILLION

*data downloads from our
Parkinson's Progression Markers
Initiative by researchers across
the globe for independent study*

Investing in and Growing the PPMI Data Set

The Foundation is expanding the impact of PPMI even further through partnerships. The Accelerating Medicines Partnership Parkinson's disease (AMP PD) program, a collaboration with the National Institutes of Health and five life sciences companies, is providing a large platform for researchers to easily access data and analysis from PPMI and other cohorts (see page 12). The cutting-edge data analysis techniques being used in PPMI and AMP PD already are pointing the way to novel targets. The largest genome-wide association study in Parkinson's to date, which included PPMI data, identified dozens of new genetic loci associated with Parkinson's. These discovery efforts may clarify what else goes wrong in Parkinson's and draw connections that can help explain the complexity of the disease.

PPMI has also partnered with Verily Life Sciences to provide more than 800 U.S. study participants with the Verily Study Watch, which captures data on movement, and various physiologic and environmental measures nearly all day, every day.

In Europe, the study is partnering with Roche to deploy its Parkinson's monitoring smartphone application, which tracks movement and collects information about other symptoms passively through daily tasks and exercises.



“Smart” Studies: Digital Health Tools Transforming Disease Understanding

TECHNOLOGY TRANSFORMS OUR DAILY LIVES AND CONTINUES TO evolve at a blistering pace. Advances in digital health tools present an opportunity for Parkinson’s disease (PD) research and care. The Michael J. Fox Foundation (MJFF) is partnering with Silicon Valley to harness technological innovations for the benefit of Parkinson’s research and patients.

Watches, Apps and Online Studies Make it Easier to Share the Lived Experience of PD

Parkinson’s is a 24-hour disease with variation from day-to-day and hour-to-hour, but research studies often gather and analyze disease data in periodic, short clinic visits. Digital health devices, like smartwatches and smartphone apps, can capture data on disease every minute, while a person goes about their day. By gathering this unprecedented amount of information, scientists aim to better understand and measure PD and its progression.

This year, the Foundation launched a data challenge with Sage Bionetworks, offering a prize for data scientists who comb Parkinson’s device data for signs of disease subtypes and progression. Placing a further emphasis on technology, algorithms that can interpret data collected through devices could help select participants for studies and inform decisions about patient care.

Additionally, our digital platform and dynamic online clinical study Fox Insight uses cutting-edge technology to allow thousands of patients to share real-time information on their lived experience of disease:

JOIN THE
40K+
*participants who are
helping power Parkinson’s
research today*
foxinsight.org

from symptoms and quality of life, to treatment satisfaction and research participation preferences. Through our collaboration with consumer genetics company 23andMe (see page 13), eligible Fox Insight participants also can add their genetic data to the study.

Fox Insight is collecting information from more than 40,000 participants with and

without Parkinson’s and hopes to recruit hundreds of thousands more. The study’s flexible design allows a broader range of patients to contribute critical information, regardless of geography and mobility.

Technology-enabled Approaches to Aid Troubling Gait and Balance Symptoms

Many people with Parkinson’s experience walking or balance problems, including walking more slowly, shuffling and freezing. These issues don’t respond well to available Parkinson’s medications, and MJFF wanted to pursue technology-enabled options for treatment. Eight teams funded

by MJFF in 2019 are testing innovative ways to treat these troublesome and underaddressed gait and balance issues in Parkinson’s disease.

There are a lot of ways applied technology could benefit patients. The challenge was to identify projects that people would use and that could be made available within two years. To accomplish this, the MJFF team invited two people with Parkinson’s — Israel Robledo and Ken Cater — to review grant proposals and ensure the selection of technologies with practical relevance to their lives.

The programs that received funding represent four continents and are being led by researchers in academia and industry, often partnering with technology companies. In Belgium, researchers from KU Leuven joined with mHealth Technologies to develop a smartphone-based wearable system that delivers cues to treat freezing of gait. Another group at The Ohio State University is working with the Honda Walking Assist Device on a program that incorporates physical therapy and the lightweight Honda robotic device to improve walking. In the Netherlands, a team from Leiden University Medical Center is working with Microsoft HoloLens on Holocue, which delivers 2-D and 3-D cues via a mixed-reality headset. Other projects are testing vibrating socks, a wearable airbag system and vibration therapy, among others, all with a goal of improving patients’ ability to walk and move freely.

“We looked at each project with an eye toward whether it was something we’d really use, how quickly it would become available and how much of a widespread benefit it would have for the patient community.”

Israel Robledo
MJFF Patient Council member



Collaborations Are Driving Progress

CURING PARKINSON'S DISEASE (PD) AND FINDING NEW TREATMENTS to manage symptoms are ambitious endeavors. We can't do it alone. We know that reaching our goals will require varied expertise and deep resources. The Michael J. Fox Foundation (MJFF) is an active partner with other groups, leveraging data and financial resources to support and accelerate Parkinson's research at scale.

Accelerating Medicines Partnership Parkinson's disease (AMP PD)

The AMP PD program funds investigation of data and biosamples from the MJFF-led Parkinson's Progression Markers Initiative, and other studies. The data and analysis are available to researchers to accelerate Parkinson's research. AMP PD is managed by the Foundation for the National Institutes of Health (NIH). MJFF is the nonprofit member, joined by NINDS and NIA (both part of NIH), the United States Food and Drug Administration and five life sciences companies.



The Foundation is partnering on a significant new funding source for Parkinson's research. The Aligning Science Across Parkinson's (ASAP) Initiative seeks to support international, multidisciplinary, multi-institutional research teams to address key knowledge gaps in the basic disease mechanisms that contribute to Parkinson's development and progression. Led by Nobel Laureate Randy Schekman, PhD, ASAP was created by the Milken Institute Center for Strategic Philanthropy with support from the Sergey Brin Family Foundation. MJFF has been significantly involved in establishing ASAP and will lend our grantmaking infrastructure to this funding program.

Biomarkers Across Neurodegenerative Diseases (BAND) program

Launched in 2014, The Biomarkers Across Neurodegenerative Diseases (BAND) program has supported 20 projects with more than \$3 million total to better understand similarities and differences Parkinson's and Alzheimer's and other neurodegenerative disorders, to develop better diagnostic tools and possible treatments. The BAND program is a partnership between MJFF and the Alzheimer's Association in the United States, the Weston Brain Institute in Canada, and Alzheimer's Research UK in the United Kingdom.



The Foundation's collaboration with 23andMe allows eligible participants to add their genetic data to our online Fox Insight study. Combined with information shared in participant surveys, this provides a more holistic understanding of the disease for researchers.



The Michael J. Fox Foundation has joined BRAIN Commons, a cloud-based data sharing platform which is sponsored by Cohen Veterans Bioscience. Through the platform we are providing the research community access to multiple comprehensive Parkinson's datasets and harnessing the power of big-data analytics to accelerate discovery and development of effective therapies.



In 2018, MJFF and The Silverstein Foundation for Parkinson's with GBA announced a co-funding program to support work to better understand the link between mutations in the GBA gene and Parkinson's disease and to develop and test therapies against this target. This year the partners announced the selection of 16 projects with nearly \$3 million received collectively.



**People Are
at the Heart of
What We Do**



FROM ADVOCACY AND OPTIMIZING CARE, TO SPEEDING RESEARCH AND educating the community, people living with Parkinson's and their families are at the heart of everything we do. The Michael J. Fox Foundation (MJFF) engages patients and incorporates varied voices and perspective into our work. By providing a more holistic and inclusive view of Parkinson's disease (PD), the Foundation works to ensure patients' most pressing needs are met.

- + Our newest patient guide, “Navigating Cognitive Changes in Parkinson's Disease,” was developed to fill knowledge gaps about potential thinking and memory symptoms in Parkinson's. It also provides practical strategies for patients and families to use to boost brain health. Written by MJFF's Vice President of Medical Communications and movement disorder specialist Rachel Dolhun, MD, the guide was developed in collaboration with leading experts — patients and families who live with PD and the clinicians who care for them. Download the guide at michaeljfox.org/cognitionguide.
- + Parkinson's affects every aspect of life — financial, physical and emotional. In 2019, MJFF and partner organizations released a study, “The Economic Burden of Parkinson's Disease” (michaeljfox.org/economicburden). It showed that the total cost of Parkinson's — to patients, their families, employers and the healthcare system — is \$52 billion a year. This doubles previous estimates. And it represents a comprehensive picture of costs, from direct medical expenses to indirect costs like missed work and family caregiving.

This new data has helped identify where support is needed and has shed light on what programs MJFF should continue to prioritize to maximize impact for patients.

- + Parkinson's is a global disease, impacting all types of people. Researchers have a responsibility to promote diversity and inclusivity in research not only because it is right and ethical but also because it leads to better outcomes for everyone. More people and more data can lead to more breakthroughs.

MJFF's guidebook, *Navigating Clinical Trials: A Guide for Parkinson's Patients and Families*, is now available in seven languages.

Download the guide at michaeljfox.org/participantpack.

And, in August, we announced grants totaling nearly \$5 million to three teams expanding genetic research in international Parkinson's populations. This initiative builds on research in Africa, East Asia and India to better define Parkinson's and point to new treatment options for people living with Parkinson's worldwide.

- + In the United States, MJFF is partnering with the Community Access, Recruitment, and Engagement (CARE) Research Center at Massachusetts General Hospital on FIRE-UP PD (Fostering Inclusivity in Research Engagement for Underrepresented Populations in Parkinson's Disease) on an innovative study to ensure that PD research is inclusive of underrepresented populations. The study will establish and evaluate outreach programs in four cities around the country, developing community-focused interventions to increase culturally relevant messaging and materials that educate and engage around Parkinson's research.

- + MJFF is training more movement disorder specialists to meet patients' needs both in the doctor's office and the lab. And the recent graduation of The Edmond J. Safra Fellowship in Movement Disorders Class of 2019 added five additional clinician-researchers to the global specialist network. Launched in 2014 with MJFF's longtime partner the Edmond J. Safra Foundation, the highly coveted and competitive fellowship annually awards funding to top-tier medical centers worldwide to each train a new movement disorder specialist over a two-year period. With their unique training, these specialists are a direct link between research and care. By the year 2022, the program is on track to graduate 26 new movement disorder specialists around the world.



DBS Registry Aims to Improve Patient Outcomes

While deep brain stimulation (DBS) is the most commonly performed surgical treatment for Parkinson's disease, patients often express concerns about timing of the treatment, and if and how it may affect their mood or personality. To minimize uncertainty, address fears and deliver the therapy as optimally as possible, MJFF

is investing \$1.6 million in a registry capturing the details and outcomes of individual's DBS surgery and treatment to learn more about how to best deliver and use this therapy. Researchers continuously analyze data and meet at scheduled intervals to evaluate outcomes to determine best practices and strategies for DBS.



JOIN THE MORE THAN

7,000

*individuals who volunteer their
time, energy, creativity and
passion to fundraising for a cure*

teamfox.org

Our achievements in advancing research and care are due, in no small part, to supportive members of the Parkinson's community — fundraisers and donors, event hosts and guests, participants and volunteers alike.

- + As of this year, Team Fox members have collectively raised — and contributed — over \$85 million to our mission. In 2019, over 7,000 individuals volunteered their time, energy, creativity and passion to fundraising for a cure. The ripple effect from this small but mighty group inspired nearly 54,000 donors to support our shared goals. Behind the numbers, are the small acts and large gestures of teams and individuals across the world.

And, in 10 cities across the country, MJFF's Fox Trot 5K Run/Walk Series and Tour de Fox Cycling Series gathered over 5,300 participants that have stakes in the race toward a cure. Nearly 360 of those individuals are living with Parkinson's disease.

+ In fall 2019, MJFF went on the road with a goal of empowering people living with Parkinson's disease and their care partners through education. "Parkinson's IQ + You," is a new series of free, educational events held in major cities across the United States. Designed for people at every stage of their journey with PD, the program represents the diversity of the PD community. Interactive sessions are led by a mix of people with Parkinson's, movement disorder specialists, researchers, care partners and allied health professionals. The accompanying Partner Expo features local resources with representatives from support groups, exercise programs and research opportunities, and more.

See page 13 in the 2020 section for the partners who make these events possible.

"To put an end to this disease for good, it's important to reach as many different people and perspectives as possible so we can educate and engage families of all backgrounds in research."

Akbar Gbajabamila

MJFF Board member and host of NBC's "American Ninja Warrior"

The Michael J. Fox Foundation presents

**Parkinson's
IQ+YOU**

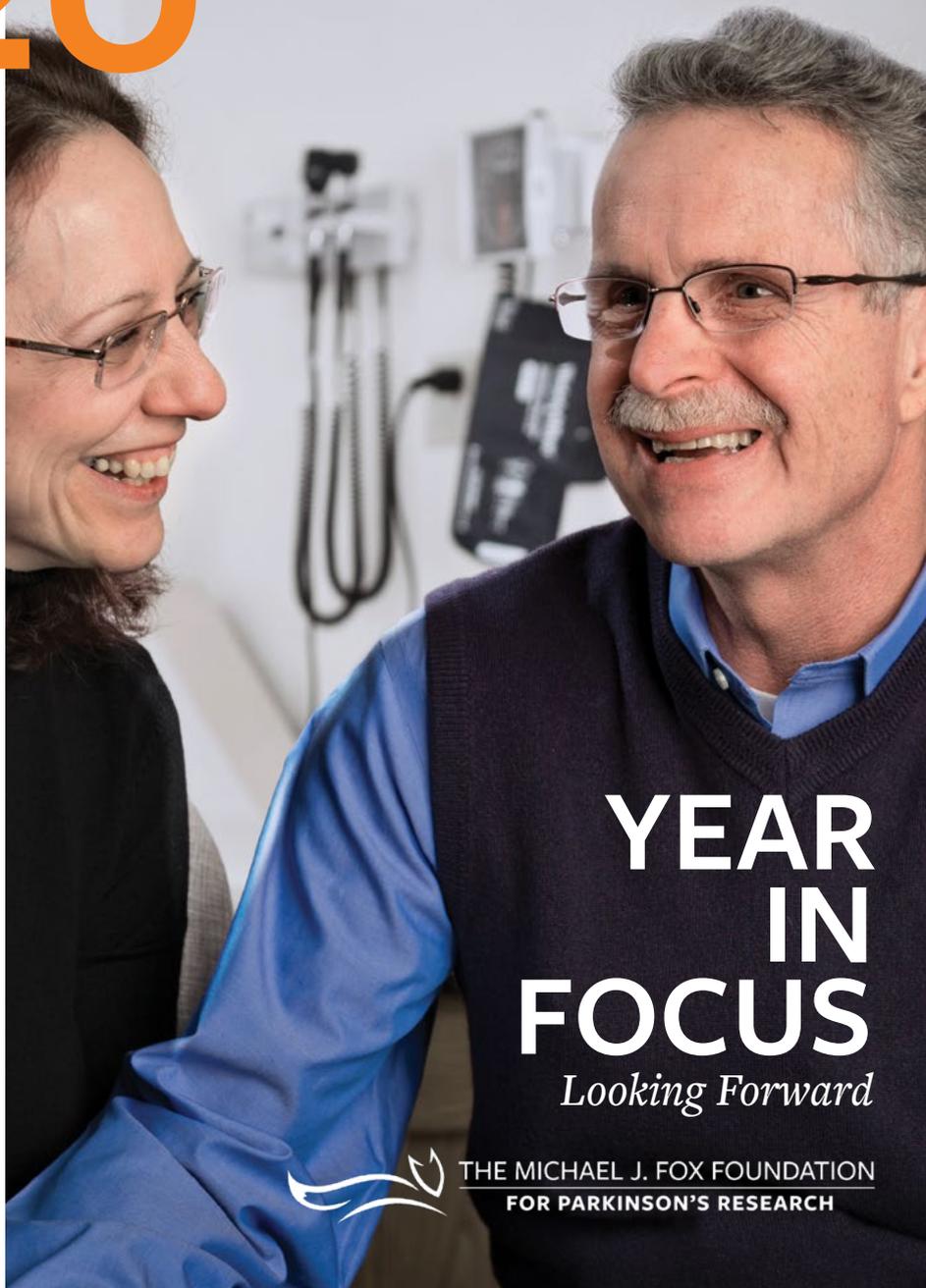
Education for Empowerment

Visit

michaeljfox.org/PDIQ

*for a calendar of
2019/2020 dates*

20
20



**YEAR
IN
FOCUS**

Looking Forward



THE MICHAEL J. FOX FOUNDATION
FOR PARKINSON'S RESEARCH

As we look ahead to 2020, the Parkinson's research landscape is brimming with opportunity and optimism.

There are endless innovative ideas to be funded, and The Michael J. Fox Foundation continues our long-standing belief that informed prioritization of the most promising science and smart investments will bring us closer to a world without Parkinson's disease.

As we enter our twentieth year of existence, we continue to embrace the core values that have driven our work since inception: a sense of urgency and responsibility to the patient community; transparency and accountability about the Foundation's actions; and productivity of every financial contribution that comes through our doors. We're here until Parkinson's isn't.

Visit michaeljfox.org/yearinreview to learn more about the projects described throughout.



Pivotal Clinical Trial Results Expected

WE ARE AMID THE MOST ROBUST PARKINSON'S DRUG PIPELINE THE field has ever seen. A number of critical Parkinson's therapy trials have entered Phase II clinical trials — where researchers assess safety and efficacy in a larger number of study participants. Results from some are expected in the next 18 to 24 months, bringing important information on the future of these treatments.

These include two different industry groups (Prothena and Biogen) testing different approaches to target alpha-synuclein, arguably the most important drug target in Parkinson's today. In another trial, Biogen is taking a unique approach to targeting LRRK2, using a so-called “antisense oligonucleotide” that targets the RNA that makes LRRK2 rather than LRRK2 itself, and is delivered via injection rather than a pill. The LRRK2 trials led by biotech Denali, described on page 2 of the 2019 section of this publication, also are expected to yield results in 2020. And a trial underway at pharma firm Sanofi Genzyme is investigating GBA, another genetic target of intense interest to Parkinson's researchers.



A different strategy is being tested by a group at Kyoto University in Japan, where researchers are attempting to implant dopamine cells made from engineered brain cells. And drug “repurposing” efforts continue to yield new possibilities for accelerating therapeutic development. In repurposing, a drug already approved by the U.S. Food and Drug Administration to treat one condition is tested for a

different one. Because the drug has already been approved, it has a known safety profile and can progress through clinical testing more quickly.

The Foundation is supporting several repurposing trials now and is investing in research to identify other approved drugs that may



benefit people with Parkinson's.

Through a partnership with the Australian Parkinson's Mission (an international collaboration between the Garvan Institute of Medical Research, Shake It Up Australia Foundation, Parkinson's Australia and The Cure Parkinson's Trust) in 2020 a large Phase II clinical trial is testing four separate repurposed therapies (alogliptin, albuterol, nilvadipine and nicotinamide riboside) for Parkinson's.

MJFF is also funding a Phase II trial of nilotinib — a

drug approved for some forms of cancer — with researchers at Northwestern University. The trial, called NILO-PD, is taking place at sites across the U.S. and results are expected in early 2020.

Ongoing Phase I trials — more focused on safety in small groups but reviewing some preliminary efficacy measures as well — also will report outcomes in the next two years.

Together with the Parkinson's community, the Foundation is watching closely and hoping for positive results that will carry many through to the next phase. In parallel, we continue to provide funding to early-stage ideas to ensure that the Parkinson's pipeline remains robust for years to come.



New Technology- enabled Research



THE MICHAEL J. FOX FOUNDATION (MJFF) BELIEVES IT IS OUR obligation to harness emerging technologies to help people living with Parkinson's. The speed of technological advances is opening entirely new avenues in research and care.

Fox Insight Online Study

In the Foundation's Fox Insight study, more than 40,000 people — with and without Parkinson's disease — are contributing information on health, disease and lifestyle to better understand Parkinson's and prioritize patient needs. For example, a study of Fox Insight data showed that many people with Parkinson's report pain or fatigue as their most bothersome symptom, highlighting the need for more treatments in this area.

Through a collaboration with consumer genetics company 23andMe, eligible volunteers can add their genetic information to the study. Genetic data combined with the user-reported data can help better understand the impact of genetic mutations.

It also can help identify participants for other studies. Trials of drugs to slow or stop Parkinson's progression are looking for people with LRRK2 and GBA mutations. Through Fox Insight, people can learn if they carry those mutations and may choose to enroll in those trials. Other studies are looking for people at risk of developing PD, to better understand onset and how to

stop it. Fox Insight genetic and clinical data could help identify people at greater risk of developing Parkinson's to enroll in those observational studies and even prevention trials when available.

Learn more at foxinsight.org

Using Technology to Treat Gait and Balance Problems

In 2019, MJFF issued a funding opportunity for “novel neurotechnology interventions” to treat gait and balance problems in people with Parkinson's.

Our goal is to apply technological solutions to a range of Parkinson's symptoms. MJFF received more than 100 applications focused on treating motor and non-motor symptoms of the disease. To increase potential treatments for patients, MJFF intentionally kept the funding opportunity open to all symptoms and technology types to spur new ideas. For this project, MJFF is partnering with the University of Florida's Norman Fixel Institute for Neurological Diseases. The Institute is a research incubation center intended to address the most critical needs of the patient community. It hosted a review meeting in October 2019, where MJFF staff and outside experts reviewed and selected projects for funding from the applications we received. In 2020, we look forward to announcing these projects and following their progress.

High-Impact Investment in Alpha-synuclein Imaging To Detect and Diagnose Parkinson's

To this day, the presence of the toxic alpha-synuclein clumps — our only objective diagnostic tool for Parkinson's — can be confirmed exclusively through postmortem tissue analysis, representing a

foremost challenge in diagnosing the disease and monitoring its progression. The ability to visualize alpha-synuclein in the living brain through the development of an imaging tracer for use in sophisticated brain imaging would jolt the field into entirely new

“I’ve often thought of successful entrepreneurs as individuals who have just the right expertise — at just the right moment — to solve the emerging problems of their time.”

Ken Griffin
*Founder and CEO, Citadel
and MJFF donor*

directions in research and care. A new \$10-million competition, announced by MJFF in fall 2019, will encourage research teams to race for this tool, with a \$2-million purse awaiting the first team to show positive clinical evidence and share a tracer with the research community at large.

The Ken Griffin Alpha-synuclein Imaging Competition (named for Griffin, Citadel founder and CEO, whose leadership gift of \$7.5 million established the competition) is structured to drive independent scientific teams to race to develop the synuclein tracer, with the expectation of funding a total of \$8.5 million to as many as three winning research teams. The team that progresses furthest

in two years or less will be awarded an additional \$1.5 million to continue the work and bring this game-changing tool to life.

The Foundation also is funding a Taiwanese company, APRINOIA, to test its alpha-synuclein PET tracer compounds, increasing the number of leads tested and researchers working on this pursuit.

Parkinson's Progression Markers Initiative Expanding to Lay Groundwork for Future Prevention Trials

PREVENTION OF DISEASE IS THE HOLY GRAIL OF ALL THERAPEUTIC development. In Parkinson's, achieving this goal requires better understanding of the disease and a rational strategy to predict it. Since the day we opened our doors, the Foundation has never stopped working toward this objective.

In 2020, The Michael J. Fox Foundation's game-changing Parkinson's Progression Markers Initiative (PPMI) will reopen to enroll more newly diagnosed and control volunteers, along with a new cohort of at-risk individuals. This not only will expand the study's extensive contributions to Parkinson's research to date, but represents a critical first step toward prevention of Parkinson's disease — a future state where it is possible to treat the disease even prior to clinical diagnosis and onset of symptoms (similar to, for example, cardiologists' ability to prevent major medical events such as heart attack or stroke through treatment of hypertension with statins).

As this report goes to press in 2019, no company is in a position to pursue a preventive intervention in Parkinson's. Yet the scientific rationale now exists to lay critical groundwork to enable future prevention studies and solidify answers to persistent questions that have stood in the way of making the vision of prevention a reality. Recent data emerging from investigations spearheaded by The Michael J. Fox Foundation have

accelerated and deepened understanding of the Parkinson’s disease process, including the insidious cascade of biological events occurring in the years prior to clinical diagnosis.

Designing and carrying out interventional prevention trials requires undiagnosed individuals who fit a narrow profile of increased risk and can be accurately anticipated to be diagnosed within a predefined timeframe. Individuals with such risk profiles are part of what researchers call “enriched populations” for study recruitment. Today, growing scientific consensus exists around a well-defined set of enriched populations for Parkinson’s prevention studies. Recent studies have credibly nominated three specific groups of risk factors that reliably predict diagnosis within two to three years:



Carriers of genetic mutations in LRRK2 and GBA, with dopamine depletion as visualized by DaTscan



Individuals diagnosed with REM Behavioral Disorder (RBD), with dopamine depletion as visualized by DaTscan



Individuals with hyposmia (smell loss), with dopamine depletion as visualized by DaTscan

Significant investments in the Parkinson’s Progression Markers Initiative over the past decade have built a sturdy scaffolding to streamline the design and implementation of a study protocol, call to action a worldwide network of scientific expertise, and reach thousands of potential study participants with a message of the urgency of their participation.

The Foundation’s track record of experience managing large-scale clinical studies, as well as our deep relationships with academic and industry researchers and with patients, poise us to relaunch PPMI with unheard-of speed in 2020.



Engaging and Mobilizing the Community



THE MICHAEL J. FOX FOUNDATION (MJFF) IS COMMITTED to connecting patients, care partners and families to opportunities to impact the trajectory of Parkinson’s disease (PD) research and drug development today — while living well with PD. Through community events and by incorporating patient voices and perspectives into our research and advocacy efforts, MJFF works to ensure that ongoing efforts reflect the needs of the community.

An Updated Fox Trial Finder Makes it Easier to Connect with Clinical Studies

In early 2020, we will be updating our Fox Trial Finder tool to make it even easier for participants to find studies they may be eligible to join in their area. It will still include clinical trials of new treatments and observational studies to learn more about the disease. Participants can perform a simple or more advanced search to get connected to trials. They will also have the option of customizing their experience and signing up to receive alerts. No sign up or registration is required to use the new tool — participants can simply visit our website (foxtrialfinder.org), search and get matched with studies.

In addition, participants will be able to call or email the clinical study site directly from the platform. The updates are designed to make it easier for people to find the right trial for them and immediately get connected.



Cities Across the Country Welcome MJFF Educational Events

The goal of the Foundation's new series of free, community events, "Parkinson's IQ + You," is to educate and empower people living with PD, their care partners, families and friends. The events provide a unique chance to meet others in the Parkinson's community, connect with local resources, explore research participation and optimize care.

Hundreds of attendees joined us for the inaugural event in Atlanta, Georgia in September 2019. Looking ahead to 2020,

events are happening coast to coast. Spaces are limited, so register early to secure your seat. Visit michaeljfox.org/PDIQ for more information on upcoming events and registration.

Parkinson's IQ+YOU

EVENTS NEAR YOU



CHICAGO, IL
May 2, 2020
Renaissance
Schaumburg

OAKLAND, CA
May 16, 2020
Oakland Marriott
City Center

PHOENIX, AZ
January 11, 2020
Arizona Biltmore

HOUSTON, TX
August 22, 2020
Hilton Americas-
Houston

HOLLYWOOD, FL
March 7, 2020
The Diplomat,
Hollywood

For more information and to register, visit: michaeljfox.org/PDIQ

These events are brought to you by ACADIA Pharmaceuticals, with support provided by Voyager Therapeutics and additional members of the Parkinson's Disease Education Consortium, an alliance of biotechnology and pharmaceutical firms who support The Michael J. Fox Foundation's commitment to furnishing high-quality educational resources for the Parkinson's community.

Advocates Creating Change With National, State and Local Policymakers

Many policy issues affect Parkinson's patients and their families — from what is, and isn't, covered by Medicare to federal research funding for Parkinson's through the National Institutes of Health.

Throughout the next year, MJFF will be strengthening our team of Parkinson's advocates around the country. Lawmakers need to

“Don't ever be afraid to tell your story, because the more people calling and emailing their members of Congress, the better. Our voices matter.”

Judy Bellenfant
Parkinson's advocate and care partner

hear from their constituents. Building relationships with representatives in Washington and at the local and state level — through calls, emails and in-person meetings — is critical to ensuring the needs and priorities of those living with Parkinson's are understood by lawmakers.

Dominic Roberts, a Parkinson's advocate from Georgia, explains: “When you advocate, you bring all your ideas into one place, formulate them so you can talk to your representatives, and it goes into legislation. That's what matters.”



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