

SPRING 2022 REQUEST FOR APPLICATIONS DEVELOPMENT AND VALIDATION OF IMPROVED OUTCOME MEASURES MAGNETIC RESONANCE IMAGING BIOMARKERS PROGRAM

BACKGROUND

Parkinson's disease (PD) is the second most common neurodegenerative disease that affects over 1 million people in the US with a global prevalence of over 10 million. PD is highly heterogeneous: individuals experience a wide array of motor and non-motor symptoms, many of which depend on disease severity and duration. Though our understanding of PD and its causes is growing, many questions remain. Currently, there are no disease-modifying therapies available for Parkinson's that alter the progression of the disease, and current symptomatic treatments provide limited relief but come with complications and side effects. The Michael J. Fox Foundation (MJFF) funds research to better define, measure, and treat Parkinson's disease as well as critical tools and other resources to advance that research.

Magnetic resonance imaging is a non-invasive tool that can uncover the structure, function, and topological organization of the brain in vivo, and more importantly provide a window into the underlying abnormalities that occur due to pathology. Advanced MRI techniques, such as fMRI, DTI, SWI, MT-MRI, NM-MRI offer the opportunity to improve the accuracy and confidence of Parkinson's Disease (PD) diagnosis and monitoring by providing a more comprehensive understanding of the disease. However, while neuroimaging modalities show tremendous potential as diagnostic, prognostic and monitoring biomarkers, these measures still show significant overlap between PD and healthy controls, and patterns elucidated from groupwise comparisons cannot yet be applied to individual patients for definitive diagnosis.

DEADLINES & REVIEW SCHEDULE

- Pre-proposals Due: September 28, 2021, 5 p.m. US ET
- Full Proposal Invitations: Week of November 15, 2021
- Full Proposals Due (by Invite Only): January 13, 2022, 5 p.m. US ET
- Anticipated Award Announcement: Week of April 18, 2022
- Anticipated Funding: April 2022

Applicants are encouraged to apply early to allow adequate time to correct errors found during the submission process.

FUNDING AVAILABLE

Duration: up to 36 months

Award Amount: MJFF plans to allocate \$5 million for this program. Requested support should be commensurate with work proposed. These budgets include direct and indirect costs. For academic and for-profit institutions, no more than 15% or 10%, respectively, may go to indirect costs. Additional details about MJFF's indirect cost policy can be found in the [Application Guidelines](#) and [FAQ](#).

ELIGIBILITY REQUIREMENTS

Applications may be submitted by researchers or clinicians in:

- U.S. and non-U.S. biotechnology/pharmaceutical companies, or other publicly or privately held for-profit entities; and

- U.S. and non-U.S. public and private non-profit entities, such as universities, colleges, hospitals, laboratories, units of state and local governments and eligible agencies of the federal government.
- Post-doctoral fellows are eligible to apply as co-investigators with the designation of an administrative primary investigator who directs the laboratory in which the fellow will conduct research. The administrative co-PI will be responsible for assisting in providing all institutional documents required for the project and will be required to sign any award contract. Training or mentoring-only proposals will not be considered.
- Funded groups using PPMI imaging data will be encouraged to work together with members of the PPMI Steering Committee to promote best practices in use and interpretation of PPMI data.

PROGRAM GOAL

Current advances in neuroimaging, machine learning and network science have produced powerful tools to study the underlying organization and function of the brain at multiple spatial and temporal scales and provided the opportunity to better define the pathophysiology of PD. To this end, the MRI Biomarkers Program aims to identify MRI biomarkers for early diagnosis, prognosis, and monitoring of PD by leveraging existing imaging data and novel imaging sequences, advances in mathematical modeling, complex network analyses and machine learning.

Funding will support programs to develop novel data modeling techniques, MRI sequences and post-processing techniques that elucidate the pathophysiology of PD.

PROGRAM PRIORITIES

Applications should focus on studies that achieve one or more of the following:

- Identification of reproducible MRI biomarkers for early diagnosis of Parkinson's disease using novel and/ multimodal modeling techniques (e.g., a fully automated deep learning neural network that identifies whole brain microstructural or functional abnormalities for automatic diagnosis of PD). The performance of these models should remain stable and independent of collection site, scanner vendor, field strength or acquisition sequence.
- Employing whole brain connectomics, complex network analyses and machine learning to elucidate topological changes that underlie the development and progression of PD (e.g., enriched connectomics that combines micro-, meso-, macro-scale brain properties to develop a connectome fingerprint of PD, or to study network disruptions specific not only to PD, but to various PD sub-types).
- Development and validation of novel imaging sequences or post-processing techniques that elucidate PD pathology (e.g., inflammation, axonal degeneration), PD progression, and therapeutic efficacy.
- Development of tools and infrastructure for imaging data analyses stemmed in best practices and consensus building that ensures reproducible biomarkers. Tools and infrastructure must be open-source and designed consistent with FAIR principles for data management to ensure interoperability with existing and future resources and allow for reusability by other members of the PD research community.

For this program, MJFF **will not consider** proposals focused on prospective data collection using standard MRI sequences. Prospective data collection is only permitted for studies that utilize novel MRI sequences.

ADDITIONAL INFORMATION

Our [Application Guidelines](#) provide general guidance about applying for funding from MJFF, though the RFA always supersedes information contained in the Application Guidelines. Please note that MJFF updated our publication and indirect costs policies in early 2020. The new [open access publication policy](#) requires articles resulting from MJFF-funded work publish in a preprint repository then in an open access forum with free and immediate readership rights.

Please note, MJFF now requires that the Principal Investigator be the primary applicant (i.e., the person who initiates and takes primary responsibility for the application). All application-related correspondence will be sent to the Principal Investigator.

DIVERSITY, EQUITY, AND INCLUSION

In pursuit of our mission to accelerate the development of better treatments and a cure for Parkinson's disease, MJFF aims to support a rigorous research agenda reflecting a wide and diverse range of perspectives on Parkinson's disease and carried out in diverse populations. Diversity may refer to characteristics including, but not limited to, race, religion, ethnicity, sex, gender identity, sexual orientation, socioeconomic circumstance, nationality, geographic background, ability and disability, political ideology, and age. Parkinson's is a complex problem; the more angles from which we attack, the greater the chances of finding innovative scientific solutions to benefit everyone living with the disease. As such:

- The Foundation encourages applications from diverse investigators representing groups historically underrepresented in the research enterprise.
- Because research shows that diverse teams outperform homogeneous ones, we urge applicants to share information about the composition of the team that will carry out the funded work.

INFORMATIONAL WEBINAR

MJFF will host an informational webinar on August 24, 2021, at 12 p.m. ET to clarify and explain the goals of our funding opportunities and answer applicant questions. The webinar will be available to view on-demand after the live airdate. Please register [here](#).

For questions about the application process or project suitability for this call for applications, please email grants@michaeljfox.org.