opnMe by Boehringer Ingelheim

Lysosomal dysfunction biomarkers for PD

How would you propose to identify a CSF-, blood-, or urine-based biomarker to stratify early Parkinson's disease patients according to the degree of lysosomal dysfunction?

Answers to this question including a proposal for collaboration can only be considered if they arrive no later than September 1, 2026, 11:59 pm PST.

Boehringer Ingelheim

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What is the context of the problem that we would like to solve?

Parkinson's disease (PD) is a chronic, progressive neurological disorder that primarily affects motor function. It is caused by the gradual loss of dopamine producing neurons in the substantia nigra, a brain region critical for movement control. This neurodegeneration leads to characteristic motor symptoms, such as tremors, muscle rigidity, bradykinesia (slowed movement), and impaired balance.

Approximately **10–15% of PD patients** carry a known genetic risk factor, such as mutations in *LRRK2, PINK1* or *GBA*. However, for most patients, no clear genetic association has been identified to date. PD is therefore considered a **multifactorial disease**, arising from a complex interplay of genetic susceptibility, environmental influences, and biological processes. Multiple pathomechanisms — including lysosomal and mitochondrial dysfunction, inflammatory processes, and impaired protein homeostasis — are hypothesized to contribute to disease onset and progression. These distinct mechanisms can ultimately converge into a clinically similar disease phenotype despite differing underlying causes.

To enable the development and effective evaluation of **mechanism targeted therapies**, it is highly desirable to stratify prodromal / early PD patients into biologically defined subgroups. Such stratification would allow novel therapies to be tested in patient populations where their specific mode of action has the highest likelihood of producing meaningful clinical benefit.

Notably, a significant portion of risk genes identified in PD patients have been associated with **lysosomal functions**, pointing to a critical role of lysosomes in PD. Despite this, no readily accessible biomarker (e.g., blood- or cerebrospinal fluid (CSF) -based) has yet been identified that reliably reflects lysosomal dysfunction at an early stage of PD. An exception is the reported increase in urinary BMP levels in patients carrying pathogenic *LRRK2* mutations, highlighting both the potential and the current limitations of biomarker development in this area.

We invite innovative proposals for non-invasive biomarker approaches aimed at identifying lysosomal markers in CSF, blood, urine, tears, saliva, or other biofluids or tissues of Parkinson's disease patients, using analytes such as proteins, lipids, metabolites, or related measures (excluding sequencing of genetic variants), in comparison with age-matched individuals without evidence of neurodegenerative disease. While the primary focus is on fluid-based approaches, imaging-based methodologies are also within scope but are considered of secondary priority.

Submissions should focus on approaches that enable stratification of patients in whom lysosomal dysfunction is a **key driver of disease onset**.

Proposals are expected to outline innovative concepts, technologies, or strategies with evidence of biological relevance, analytical robustness, and potential for clinical translation.

What potential solutions could be in scope?

Innovative solutions and approaches must meet all of the following criteria:

1. The biomarker needs to be relevant for patients in the prodromal and/or early PD stage
2. Should make use of easily accessible human patient material
3. The approach needs to be tailored to detect changes associated with lysosomal dysregulation and/or function
4. Targeted biomarkers need to allow for quantitative assessment
5. Outcome should be translatable, i.e., measurable in preclinical animal models (e.g., rodents) and/or relevant *in vitro* disease models (iPSC-derived cell/organoid systems) as well

While the primary focus is on fluid-based approaches, imaging-based methodologies are also within scope but are considered of secondary priority.

What potential solutions would be out of scope?

- Biomarkers that only qualify for mid- to severe/end-stage PD patients
- Sequencing/genotyping for known PD risk factors / genetic variants
- GWAS or related screens
- Brain biopsy-related or postmortem assessments
- No invasive procedures will be considered, except for CSF or skin sampling.
- *in silico* biomarkers inferred from computational models or simulations of behavioral observations and systems biology data (e.g., lung or cardiac function)
- *in silico* biomarkers derived from imaging modalities (MRI, PET, CT, ultrasound) and digital data sources (e.g., wearables, sensors, smartphones)

What benefits do we offer to you in exchange for having submitted a solution?

If your project is selected, you will have the opportunity to directly collaborate with Boehringer's Neuroscience Research experts.

You can also expect appropriate funding for the prospective collaboration period. Your exact funding request should be outlined in your proposal. As a framework, we suggest that your initial funding request is structured in milestones and does not exceed 300,000 euros per submitted project in total (150,000 euros per year for a maximum period of 2 years, including direct, indirect, and overhead costs). Please note that depending on the complexity and maturity of a proposed model and the degree of validation, different budget terms could be negotiated with you.

Our collaboration agreement will provide full transparency about each partner's rights & obligations (including intellectual property rights). As part of the agreement, you will be encouraged to publish following the collaboration agreement (to be negotiated in good faith).

What are the key success criteria on which we base our selection for the best answer?

The proposal needs to be highly feasible, should be based on established and existing methods, essays, and involve tools / reagents that are either available or which can be easily produced. We expect that the project will be executed in your laboratory and take advantage of existing technologies and methods.

In addition, we are seeking research collaboration proposals that contain:

- A well-structured proposal outlining a new and compelling scientific approach.
- Outlining of the technical feasibility, and potentially existing data or previous publications that support feasibility / experience with outlined technology, based on existing and established assays.
- Your exact funding request should be outlined in your proposal based on a well-thought-through project. The project should be structured in milestones and planned with key decision points (clear Go/No-Go criteria). The funding request for the initial milestones resulting in a Go/No-Go decision should not exceed 300,000 euros per submitted project in total (150,000 euros per year for a maximum period of 2 years, including direct, indirect, and overhead costs). Please note that depending on the complexity and maturity of a proposed model and the degree of validation, different budget terms could be negotiated with you.
- Proven track record in the required field of expertise.
- Ability to implement the outlined solution as part of a scientific collaboration project with Boehringer Ingelheim including access to a wet laboratory.
- Proposals with an anticipated execution time of two years will be prioritized.

What information should be included in your answer submission?

Please use our answer submission template to provide a 2–3 page non-confidential proposal (available for download on the following site).

If confidential data exists that would strengthen the proposal, please indicate that information is available to share under a Confidential Disclosure Agreement (CDA). If we find the non-confidential concept proposal sufficiently interesting, we will execute a CDA for confidential discussions.

Anticipated Project Phases or Project Plan

Phase 1	Please complete your submission by **September 1, 2026, 11:59 pm PST at** the very latest.
Phase 2	Our review of all proposals will be completed during the second half of October, and scientists will be informed after that.
Phase 3	Start of discussions for the collaboration agreement in Q4/2026.

Submitting a collaboration proposal

- Check the outline of the opn2EXPERTS "Lysosomal dysfunction biomarkers for PD" on opnMe.
- Alternatively, you may click the "Get Submission Template" banner to access the material transfer template.
- Follow the instructions to upload your submission document (requires login or registration).
- The upload allows you to attach additional application files if desired.
- You will be able to access your final submitted collaboration proposal in your personal dashboard and follow its review status.
- Please also visit the FAQ section on opnMe.com to learn more about our opn2EXPERTS program.