The Development of a Parkinson's Disease Biomarker Inventory Dashboard

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Background:
Biomarkers for early diagnosis and disease progression in PD are urgently needed as clinical assessment alone cannot sufficiently reflect target engagement. To facilitate the identification of candidate biomarkers several large longitudinal PD cohorts have been established and collect cerebrospinal fluid (CSF), blood, and saliva, however, the biomarkers sampled across these cohorts are not standardized. The goal of this PD Biomarker Inventory and Dashboard is to create a unified dashboard to query across PD cohorts as an initial step to accelerate the identification of the most promising biomarkers.

Objective:
There is an urgent need for validated biofluid biomarkers in Parkinson’s disease (PD) drug development. Under the auspices of the Critical Path for Parkinson’s Consortium (CPP) in collaboration with the Michael J. Fox foundation, initial steps are taken to take inventory and create a user-friendly dashboard that catalogs biofluid biomarkers and samples across PD clinical trial cohorts.

Methods:
An initial inventory was constructed using PPMI PD cohort as a framework for variables and results to capture. Using this framework data has been tabulated to provide an overview of each cohort including which biofluid samples were collected, how many PD patients were included in the cohort, and PD disease stage. On the resulting publications, the biospecimens were examined, biomarkers measured, inflammatory mediators measured, and key findings and conclusions from the study were also documented (Figure 1). The data was then collected to display into an interactive dashboard to make it searchable and user-friendly.

Results:
Progress to date includes the development of an inventory of 16 PD cohorts. Among the 16 cohorts, early-stage PD patients were the most sampled, and whole blood and CSF were the most commonly sampled. CSF, serum, and plasma were most commonly reported on in publications, with alpha-synuclein the most prevalent biomarker. This data has all been categorized into an interactive searchable dashboard (Figure 2).

Conclusions:
A biomarker inventory for PD is an important first step to evaluating the data and samples available across global PD cohorts. An open-access user-friendly interactive dashboard will make it simpler to find existing data on PD cohorts and research on PD biomarkers. Future plans include expanding the inventory to include additional PD cohorts and neuroimaging biomarker data.

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FIGURE 1. Example of dashboard output providing information on main study outcomes.

FIGURE 2. Screenshot of interactive searchable dashboard that can be queried for biomarkers across selected studies.

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