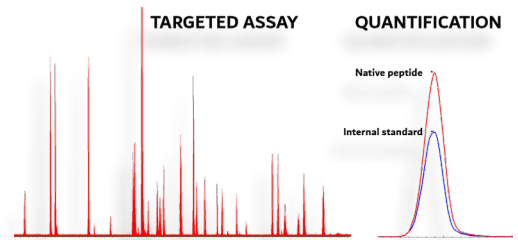# MOLECULAR PHENOTYPING FOR PARKINSON'S DISEASE

DEVELOPING A MULTIPLEXED BIOMARKER ASSAY FOR EARLIER AND MORE PRECISE DIAGNOSIS OF PARKINSON'S DISEASE TO IMPROVE MEDICATIONS DEVELOPMENT PROGRAMS.

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Market need and potential

Parkinson's disease (PD) is a progressive neuro-degeneration disorder diagnosed in approximately 10 million people worldwide. When PD is initially diagnosed, at least 50% of the dopamine neurons responsible for initiation of motion are already dead and there is currently nothing that can be done to slow the progression of the disease.

Billions of dollars have been spent on clinical trials that have failed, generally due to the late stage and broad molecular heterogeneity of the enrolled patient populations. What is needed is both a clearer understanding of the individual etiologies of PD patients and biomarkers to identify these patients in earlier stages of the disease. A reliable biomarker tool that could distinguish between molecularly distinct subsets of parkinsonian patients earlier in the course of the disease could help in the design of more targeted therapeutic trials.

Business idea

By analysing unique biobank samples, we have identified a network of candidate peptide biomarkers that can be used for stratification of parkinsonian patients based on molecular deficits. These biomarkers can be used in a diagnostic tool employing mass-spectrometry based multiple reaction monitoring (MRM) including stable isotope labelled standards (SIS) for peptides from multiple proteins quantified in a single assay.

Based on the identified biomarkers our goal is to design an in vitro diagnostic (IVD) tool that meets the need for improved patient stratification in clinical trials of targeted drug development programs.

Competition

Today, PD is diagnosed by a neurologist based on classical movement deficits. There has been much effort towards developing biomarkers for PD including the use of brain imaging and measurement of α-synuclein. Despite these efforts, there are no approved clinical diagnostic tests that can provide a certain PD diagnosis available on the market and uncertain or incorrect diagnoses are common.

Advantages

The advantages of an MRM biomarker tool for parkinsonian disorders include:

- Stratification of clinically similar parkinsonian patients that have distinct molecular deficits

- Prediction of both risk for developing PD and rate of disease progression

- Rapid assessment of molecular biomarkers that may be responsive to medications

- Precise quantification of multiple biomarkers from several molecular pathways in a single assay

Current status

We are verifying the need for biomarkers to stratify patients for more targeted clinical trials by interviews with pharmaceutical companies that are developing drugs for PD. We are currently performing both technical and clinical validation assays in house for proof of concept and are preparing plans for both regulatory and product development. Our intellectual property evaluation is on-going, and we plan to submit patent applications during the coming year.

PROJECT PROFILE

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IPR

Our IP strategy is to secure intellectual property rights to novel biomarkers discovered using biobanks of longitudinal CSF and pre-symptomatic blood samples, and to validate and translate previously identified biomarkers for which we have freedom to operate.

Partnership

We are looking for long-term collaborations with pharmaceutical or diagnostic companies involved in drug development for PD that need to select patients for clinical trials based on molecular phenotyping.

Team

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Background

This project is an effort to translate academic research into a product that can benefit patients with PD. The research has been carried out at Umeå University Hospital and University within the research groups of Miles Trupp, Lars Forsgren and collaborators. The project is currently resident at the Umeå Biotech Incubator.

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