

**Individuals and Organizations Completing Research in the Lab:**

Andrew Radin

MS

Department of Biomedical Informatics

Stanford University

Research Objectives and Aims: This project will provide a set of tools to allow Parkinson's researchers to conduct drug repurposing studies using clinical data.

**Scope/Proposed Approach:**

Become familiar with the IMEDS OMOP / Common Data Model for use with this project.

Create a machine-learning based classifier to identify Parkinson's patients from clinical data sets. The classifier will use both structured and unstructured data as input to the machine learner. A wide variety of classification algorithms and parameters will be examined in order to build a Parkinson's-optimized classifier.

Create a mechanism to provide complimentary control groups for further study of Parkinson's populations. We will seek to characterize Parkinson's patients among multiple dimensions (age, gender, race, etc.) and use these attributes to automatically generate a randomized control group of individuals with similar attributes to Parkinson's populations.

Create a tool to map drugs taken by Parkinson's and control groups to the national drug file reference terminology (NDF-RT) as per the unified medical language system (UMLS)

Create a tool to further map drugs into pharmacologic classes via NDF-RT ontologies such as chemical structure and mechanism of action.

Provide a mechanism to experimentally determine key parameters for a classification of a Parkinson's protective drug such as length of drug treatment, duration of surveillance window and length of condition existence.

Tools will be verified against other studies that have indicated that TCA anti-depressants and calcium-channel blockers are protective against Parkinson's disease.

**Impact:** By providing tools for identifying drugs that are potentially protective against Parkinson's disease, future researchers may reveal new drug treatments to stop or reverse the progression of the disease, or offer new insights into the mechanism of action of protective drugs.

**Experience:** Andrew A. Radin, MS, biomedical informatics student at Stanford University via Stanford's SCPD graduate program under the direction of Nigam Shah, PhD, Assistant Professor of Medicine (Biomedical Informatics) at Stanford University.