Precision Medicine for Alzheimer Disease and Related Disorders

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The proposed project seeks to leverage the comprehensive cognitive aging database acquired from the community-based Framingham Heart Study (FHS) multi-generational cohorts as a foundation in which to use "big data" analytics and address the question of how to find a cure for Alzheimer's disease. The Framingham Heart Study (FHS) is one of the longest running epidemiologic studies in the world. With over 6 decades of prospectively obtained data, it boasts one of the most comprehensive health databases on cognitive aging and dementia acquired from a community-based population. Thomson Reuters is the world's leading source of information and through their Pharma and Life Sciences Division, they have created an exclusive systems biology platform that merges a one-of-a-kind knowledge database and cutting edge analytic tools with high level data analytic expertise, which applied together can unveil new directions for innovative treatments.

For this ARC grant, Framingham Heart Study/Boston University will partner with Thomson Reuters in use of their proprietary data mining and systems biology platform. The primary question we seek to address is whether the path to effective treatment of AD lies in identifying Alzheimer's **diseases**, potentially resulting in multiple drug targets rather than one. As an initial step to answering this question, we propose to use novel data mining tools to identify from already existing FHS data, AD subtypes, each of which may be different in its etiology and reflect a different drug target opportunity.

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