

Integrated Neurocognitive and Sleep-Behavior Profiler for the Endophenotypic Classification of Dementia Subtypes (INSPECDS)

<https://neurodegenerationresearch.eu/survey/integrated-neurocognitive-and-sleep-behavior-profiler-for-the-endophenotypic-classification-of-dementia-subtypes-inspecds/>

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Country

USA

Title of project or programme

Integrated Neurocognitive and Sleep-Behavior Profiler for the Endophenotypic Classification of Dementia Subtypes (INSPECDS)

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

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30/09/2016

Total duration of award in years

1

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease Related Dementias (ADRD)... Alzheimer's Disease including Alzheimer's Disease Related Dementias

(AD/ADRD)... Basic Behavioral and Social Science... Behavioral and Social Science... Bioengineering... Biomedical Informatics Research... Biomedical Information Resources and Informatics Research... Brain Disorders... Clinical Research... Clinical Research - Extramural... Clinical Trials and Supportive Activities... Dementia... Lewy Body Dementia... Networking and Information Technology R&D... Neurodegenerative... Neurosciences... Sleep Research... Translational Research

Research Abstract

? DESCRIPTION (provided by applicant): It is estimated that neurodegenerative diseases causing dementia will surpass cancer as the leading cause of death by the year 2040. Alzheimer's disease (AD) is the leading cause of dementia, followed by synucleinopathies, such as dementia with Lewy bodies (DLB) and Parkinson's disease with dementia (PDD). Among clinical researchers focused on investigating the varying etiologies, genetic associations, biomarkers, and treatment options for these neurodegenerative diseases, there is an urgent need for effective tools to aid in the classification of dementia subtypes, in the earliest detectable stages of the pathophysiological process. To address this unmet need Advanced Brain Monitoring (ABM) proposes to leverage two previously developed technologies to create an Integrated Neurocognitive and Sleep-Behavior Profiler for the Endophenotypic Classification of Dementia Subtypes (INSPECDS). The core components of the INSPECDS platform will be a previously developed Alertness and Memory Profiler (AMP), a recently developed Sleep Profiler, and integrated machine-learning, classification algorithms, hosted on a secure, cloud-based, infrastructure for automated data processing, analysis, and reporting. The AMP was developed and validated during a previous NIH-funded SBIR Phase I/II project for the purpose of detecting the neurocognitive effects of sleep deprivation in adults diagnosed with obstructive sleep apnea. The AMP is truly unique among neurocognitive testing platforms in that it is the only one which integrates advanced, electrophysiological measures (e.g., 24-channel, wireless EEG and ECG) during the performance of computerized neurocognitive tasks. This advanced capability permits researchers to explore real-time relations between fluctuations in alertness, discrete cognitive functions, and specific neural processes believed to subserve observed performance deficits. The Sleep Profiler is an FDA-cleared, easily applied, wireless-EEG device that was developed and validated to measure sleep architecture for in-home sleep studies. With integrated measures of submental (chin) EMG and wireless accelerometers to monitor head and limb movements, the Sleep Profiler is an ideal device for quantifying the characteristics of REM-sleep behavior disorder (RBD), which is considered to be a prodromal expression of synucleinopathy. Furthermore, the application of sophisticated, machine-learning, classification algorithms will streamline the processing and analyses of these data to derive statistical probabilities of various dementia subtypes. The overarching goal of the current, Direct-to-Phase II, SBIR project is to develop a secure, cloud-based infrastructure to compile the data obtained from the AMP and Sleep Profiler, train classification algorithms to discriminate among dementia subtypes, validate diagnostic accuracy, and integrate optimized classifiers within the cloud-based architecture. Once completed, the INSPECDS system will be the first clinical research tool of its kind and find immediate application in both university-based research settings and pharmaceutical industry clinical trials to aid in the endophenotypic stratification of research participants.

Lay Summary

PUBLIC HEALTH RELEVANCE: Among clinical researchers focused on investigating the varying etiologies, genetic associations, clinical course, and treatment options for

neurodegenerative diseases, there is an urgent need for effective tools to aid in the classification of dementia subtypes, in the earliest detectable stages of the pathophysiological process. To address this unmet need, Advanced Brain Monitoring (Carlsbad, CA) is developing Integrated Neurocognitive and Sleep-Behavior Profilers for the Endophenotypic Classification of Dementia Subtypes (INSPECDS), which will provide an inexpensive, non-invasive solution combining neurocognitive, electrophysiological (EEG, ECG, EMG), and sleep-behavior assessment into a single, integrated system featuring automated scoring and classification algorithms. Once completed, the INSPECDS system will be the first clinical research tool of its kind and find immediate application in university-based research settings and pharmaceutical industry clinical trials to aid in the endophenotypic stratification of research participants.

Further information available at:

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Investments > €500k

Member States:

United States of America

Diseases:

Alzheimer's disease & other dementias

Years:

2016

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