Novel microRNA biomarkers in blood for the design of personalized therapy in Alzheimer's disease

One line pitch

The invention provides a novel blood-based biomarker panel of microRNAs for early diagnosis of Alzheimer's disease.

Market analysis and unmet patient needs

Alzheimer's disease (AD) is the most common cause of age-related dementia worldwide. The number of AD cases is rapidly growing. As of 2015, there were 46.8 million people with dementia globally. This number is expected to reach 131.5 million in 2050. AD causes are complex and not completely elucidated. Therefore no causative therapies exist and only symptomatic treatments are available. The disease starts years before patients experience memory loss, and gradually progresses through Mild Cognitive Impairment towards severe dementia stages. Lack of success in recent clinical trials aiming to treat AD in later AD stages indicates that early detection of AD, before memory loss, is crucial for the higher effectiveness of therapies. **Such early AD biomarkers are currently not available for a common clinical practice**.

Competitive Advantage

Our invention addresses the needs for early diagnosis of AD and perfectly meets the requirements for non-invasive, easy-to-access biomarkers. Our diagnostic test allows for the identification of early Alzheimer's disease as etiology of dementia, Mild Cognitive Impairment or Subjective Cognitive Impairment.

We identified a unique molecular signature of early AD as a panel of microRNAs in blood plasma. Moreover, we found that relative plasma levels of miRNAs of our panel allow for the identification which of the complex molecular pathways contribute to the disease. Therefore **the miRNA panel allows for sub-classification of a patient for personalized and targeted therapy, and for monitoring of treatment effectiveness.**

Currently we develop the predictive algorithm that will allow the translation of the ratio of the levels of the particular microRNA(s) to personalized therapies.

IP Situation and Reference

The invention is covered by the PCT application PCT/EP2017/059800, Pub. No.: WO/2017/186719; Priority Data for PCT/IB2016/052440: 29.04.2016; Priority Data for PL416956: 25.04.2016

Nagaraj S, Laskowska-Kaszub K, Dębski KJ, Wojsiat J, Dąbrowski M, Gabryelewicz T, Kuźnicki J, Wojda U.
Profile of 6 microRNA in blood plasma distinguish early-stage Alzheimer's disease patients from non-demented subjects.

Oncotarget. 2017 Mar 7;8(10):16122-16143.

Area:
Life science, Diagnostics, Biomarkers, Dementia, Alzheimer's Disease

Project stage:
discovery, collected new samples and ongoing enrollment of new patients for further development of the predictive algorithm

Business development stage:
ready for licensing

Leading Scientists:
Prof. Urszula Wojda: Head of Laboratory of Preclinical Studies, Polish expert in the Management Board of the largest world organization in the field of Neurodegeneration for the EU Joint Programming initiative (JPND); Co-author of over 40 articles in JCR journals

Prof. Jacek Kuźnicki: Director of IIMCB, Head of Neurodegeneration Laboratory. Co-author of over 100 articles in JCR journals

Organization Information:
IIMCB: Nine research groups, 78 researchers, 40 PhD students

Nencki: 30 scientific Laboratories and 8 core-facility laboratories, 120 research scientists, 200 PhD students

Biotech Innovations Ltd.: transfers the most advanced R&D results from the research laboratories to the marketplace

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