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EU grants €3 Million to better predict and diagnose memory disorders

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The research project PredictND, co-funded by the EU, will take an important step towards better prediction, diagnostics and management of memory disorders.



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This week, a consortium of leading research institutions across Europe announced the PredictND project: an EU-funded research collaboration aimed at developing and validating new procedures for earlier diagnosis of memory disorders. This benefits millions of Europeans who are at risk for experiencing any kind of memory loss.

Early detection is crucial

"This project has been granted European money because increasing the quality of life in Europe is high on our agenda, and memory disorders affect this seriously", explains project officer Amalia Vlad of the European Commission. "To treat these disorders, early detection and an accurate diagnosis are essential."

It is important to predict memory disorders before the symptoms start, especially in Alzheimer's disease where the pathological process leads to death of brain cells. New cost-efficient methods are needed for detecting persons at high risk and corroborating this with new ways of intervention. PredictND will develop computer-based methods for the early detection of persons at high risk.

One of the project partners, GE Healthcare, has already developed a PET amyloid imaging agent, a potentially powerful tool in aiding the diagnosis of Alzheimer's disease. "But results from this tool must be combined with other types of information to fully characterise the patient", says Dr Lennart Thurfjell, Head of Biomarkers and Software, Medical Diagnostics at GE Healthcare.

Diagnosing is complicated

Diagnosing memory disorders is complicated as multiple reasons can explain degeneration of cognitive capacity. Alzheimer's disease is the most common reason explaining 60-70 % of cases. Today no single test or biomarker can predict whether a particular person will develop Alzheimer's disease.

On top of that, clinicians experience an overload of information: They need to combine information from multiple tests and biomarkers for finding the correct reason and name for the disease.

The PredictND research project, co-funded under the European 7th Framework Program, will not only develop new, cost-efficient methods for enabling earlier and more reliable diagnostics of different memory disorders in clinical practice; PredictND will also provide tools that help clinicians to form a holistic view of the patient by combining information from several sources, such as clinical tests, imaging and blood samples, and by comparing these measurements to previously diagnosed cases available in hospital databases.

Manage the information load

"Next to better predicting memory disorders, PredictND wants to provide a completely new approach for clinicians to systematically manage the information load that they are facing in current clinical practice", says the Scientific Coordinator of the project, Dr Jyrki Lötjönen from VTT Technical Research Centre of Finland.

"For that, we intend to transfer state-of-the-art computer-based technologies - for example for image analysis and machine learning - to modern hospital environment for helping clinicians in their daily work. Adopting such technologies would change the current decision making dramatically."

The novel approach will be tested for 800 patients in four top-hospitals in Europe: Kuopio (Finland), Copenhagen (Denmark), Amsterdam (the Netherlands) and Perugia (Italy), and compared with the existing diagnostic procedures.

Big data

The use of the modern machine learning techniques and the exploitation of large databases, i.e., "big data" as it is called nowadays, is still relatively limited in clinical practice.

Hilkka Soininen, professor of neurology from the University of Eastern Finland says: "The innovation of the project is to test a decision making tool for detection and differentiation of memory diseases as early as possible, which will allow earlier interventions and treatments. Decision supporting tools will be coming into tomorrow's clinical practice. These tools can help a clinician to extract the most important information and profiles among multitude of data."

Health priority

Dementia is a health priority in Europe. Alzheimer's disease alone accounts for costs equivalent to about 1% of the gross domestic product (GDP) of the whole world and the number of persons affected will double in the next 20 years. Alzheimer's disease affects more than 5 million people in Europe.

Partners

The PredictND research consortium is formed by eight top level research, academic, industrial and medical organisations from five different European countries: VTT Technical Research Centre of Finland, GE Healthcare (UK), Imperial College London (UK), University of Eastern Finland, Rigshospitalet (Denmark), VU Medical Center Amsterdam (the Netherlands), University of Perugia (Italy) and Alzheimer Europe (Luxembourg).

The project will run for four years with a total budget of €4,219,646 to which the EU will contribute €3,148,000.

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A project website will be available soon. The PredictND project is a "Virtual Physiological Human" ([VPH](#) [4]) project, so it will use computer models to simulate the human brain.

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Project

PredictND

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