NEWSLETTER:
INTERREG. PROJECT ‘HERINNERINGEN’

Issue 1, 07.2018

RECENT PROGRESS:

1. Risk factors of choice were selected;
2. Eleven induced pluripotent stem cell (iPSC) lines were identified and acquired;
3. Quality control of the cell lines is in progress.

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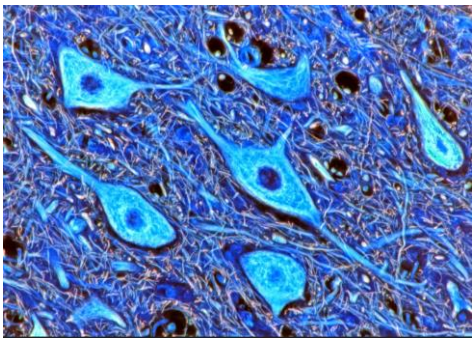
PRIVATE-PUBLIC FUNDED INNOVATION LOOKING AT ALZHEIMER’S DISEASE INITIATION AND DEVELOPMENT IN A DIFFERENT WAY

Much of Alzheimer disease (AD) research has been traditionally based on the use of animals, which have been extensively applied to both improve the understanding of the pathophysiological mechanisms of the disease and to test novel therapeutic approaches. However, decades of such research have not effectively translated into substantial therapeutic success for human patients.

The project ‘Herinneringen’ (‘Memories’) (https://herinneringen.eu/nl) applies a non-animal *toxicogenomics approach* to acquire insight into processes which are affected by external risk factors for human disease. Data from human cortico-neural cell exposure models, clinical samples and human study cohorts, representing healthy individuals as well as patients with various stages of AD, will be combined to identify potential molecular initiation events and early processes leading to clinical AD.

It is hypothesized that understanding of the early (pre-clinical) molecular and cellular processes that link mechanistically to processes that are suggested in the literature to play a role in the clinical phase of the disease will lead to methods for early diagnosis, improved animal models for preclinical assessment and novel therapies.



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''The traditional Alzheimer's research paradigm is failing, it is time for a paradigm shift.''

'HERINNERINGEN' CHALLENGES THE HUMAN RELEVANCE OF THE CURRENT AD RESEARCH

The project addresses human relevance by applying an array of research approaches that are offering new ways for studying the human brain while yielding meaningful human relevant data: (i) human-based models using patient-specific induced pluripotent stem cell (iPSCs) derived neuronal, and eventually glial, cultures, (ii) data-driven (epi-)genomics technologies for unbiased overall analyses of biological samples, (iii) computational analytical approaches, and (iv) novel neuroimaging readouts.

The human relevance of the data will be confirmed retrospectively and prospectively by data obtained from age and gender matched clinical samples and human study cohorts, respectively.

It is hypothesized that the paradigm shift and the application of novel approaches improves our understanding of initiation and early development of AD pathology, thereby contributing to the development of methods for early diagnosis, novel drug development and treatment of AD.

Project expertise

Icometrix (https://icometrix.com)

- Supporting prospective evaluation of selected biomarker signatures with Magnetic Resonance Imaging (MRI) for objective quantification of relevant brain structures in individual AD patients.

Stem Cell Institute Leuven, Katholieke Universiteit Leuven (https://www.kuleuven.be/samenwerking/scil)

- Providing the necessary iPSC expertise required for the identification and handling of relevant human iPSC lines, as well as production and quality control of iPSC-derived human neuron cell models for testing.

reMYND (https://www.remynd.com)

- Application of the genetic signatures to validate proprietary AD mouse models and to improve the assessment of *in-vivo* characteristics, pharmacokinetics, pharmacodynamics and the effects of experimental treatments.

ToxGenSolutions (www.toxgensolutions.eu)

- Valorisation of (epi-)genetic biomarker signatures as novel methods for diagnosis, novel tools for follow-up of disease progression or response to treatment in humans, and novel drug development.

Department of Biomedical Science, University of Antwerp (https://www.uantwerpen.be/nl/faculteiten/faculteit-fbd/onderzoek/departementen-en-ond/dept-biomedische-wetenschappen)

- Supporting evaluation of emerging biomarker signatures with well-characterized clinical samples (retrospective evaluation), and study cohorts (prospective evaluation).

Department of ToxicGenomics, University of Maastricht (https://toxicogenomics-um.nl)

- Providing the required expertise in (epi-)genetic approaches for the identification of early-AD specific peripheral biomarker signatures.