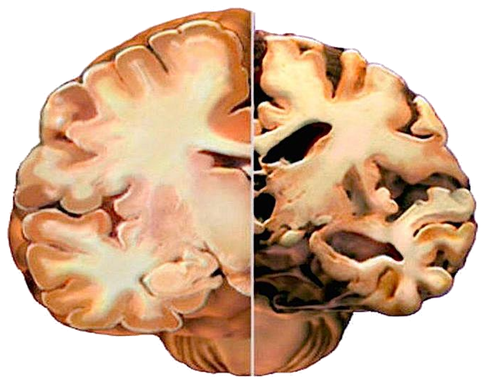
ALZHEIMER'S DISEASE from a genetics and transcriptomics perspective

VIB –UAntwerp Center for Molecular Neurology
Prof. Dr. Kristel Sleegers
Contact: kristel.sleegers@uantwerpen.vib.be

SLEEGERS LAB

The Sleegers lab at the VIB-UAntwerpen Center for Molecular Neurology is committed to increase insight in the complex genetics of Alzheimer's disease and to investigate the translational potential of genetic discovery.

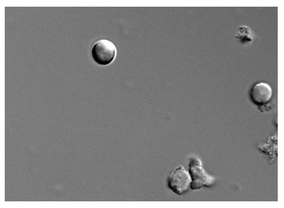


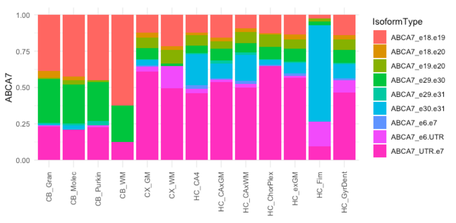
TECHNIQUES

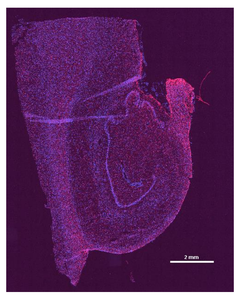
SNP genotyping, short and long read DNA/RNA sequencing, spatial transcriptomics, single nuclei sequencing, gel electrophoresis, fragment analysis, Western blot.

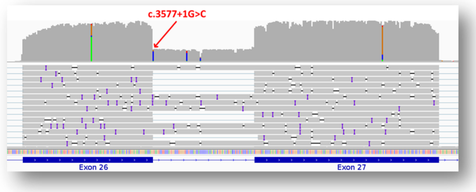
Bioinformatic data processing, genome-wide association analysis, whole exome rare variant association analysis, genetic risk prediction, quantitative trait locus analysis (eQTL, sQTL, mQTL, pQTL), transcriptome wide association analysis, X-chromosome analysis.

ALZHEIMER RISK GENE *ABCA7* FROM AN RNA PERSPECTIVE

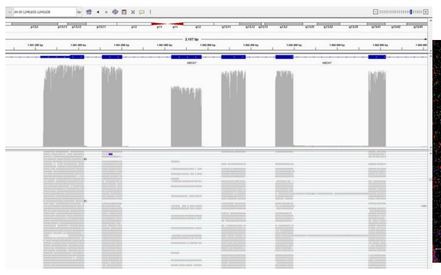


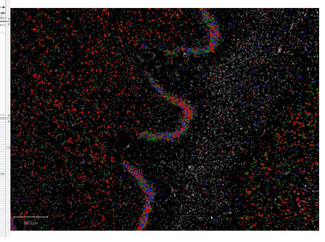






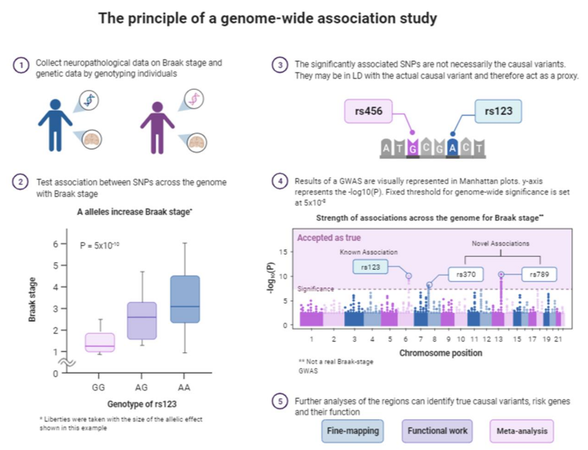
Long read cDNA sequencing, spatial expression and single-nuclei RNA sequencing of *ABCA7* in post-mortem brain tissue

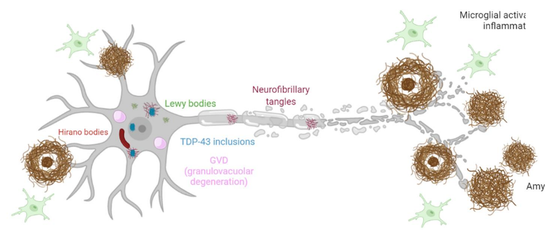




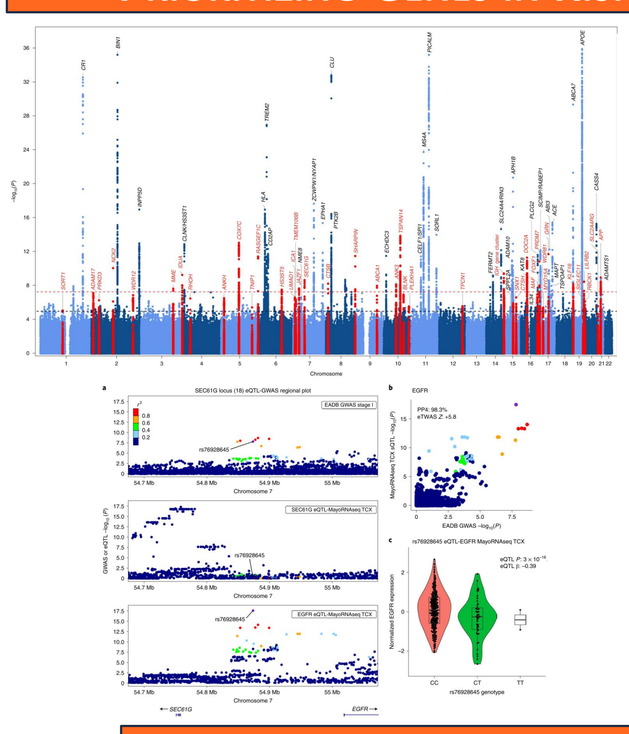
GENETIC PREDICTORS OF NEUROPATHOLOGY

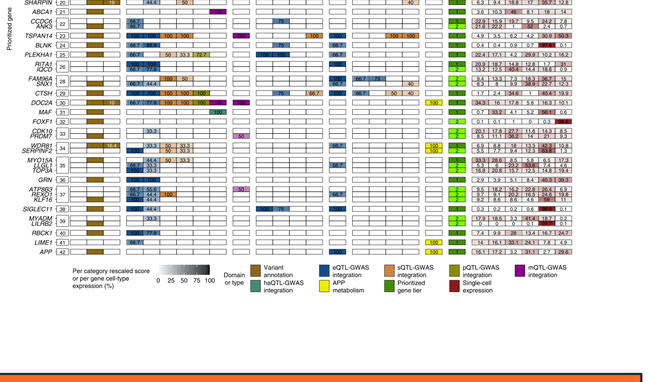
Discover **novel** risk variants (**GWAS**) and investigate **known risk loci** in neuropathological cohort



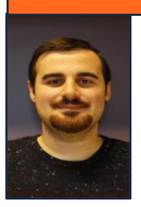


GENOME-WIDE ASSOCIATION STUDIES OF ALZHEIMER'S AND PRIORITIZING GENES IN RISK LOCI WITH INTEGRATIVE -OMICS

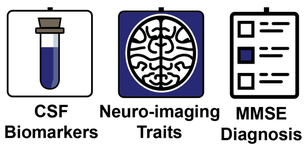


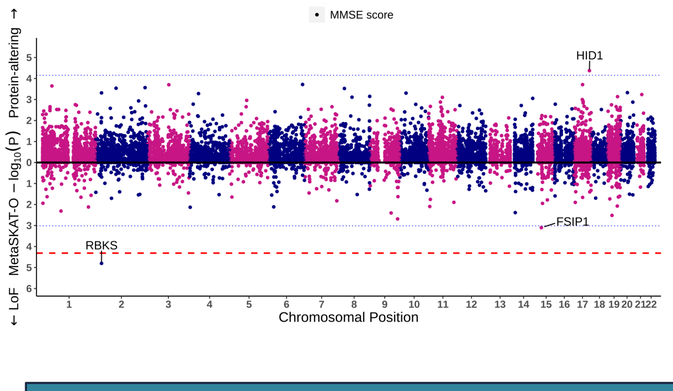


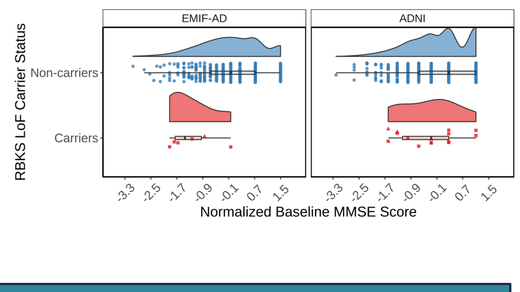
GENETICS OF ALZHEIMER'S BIOMARKER TRAITS



Common and rare variant genetic analyses of **cognitive, cerebrospinal fluid (CSF) and volumetric magnetic resonance imaging (MRI)** phenotypes.



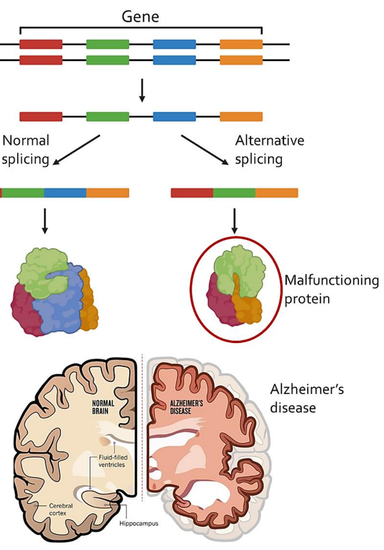


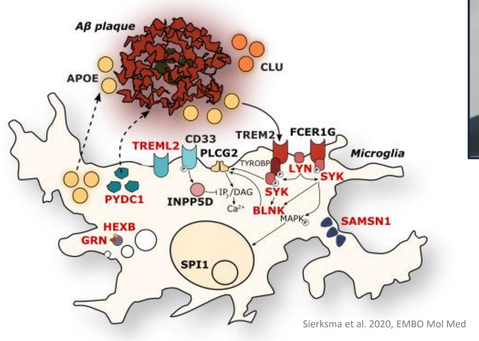


KEY PAPERS

- Bellenguez, C., Küçükali, F. et al. New insights into the genetic etiology of Alzheimer's disease and related dementias. Nature Genetics (2022).
- Küçükali, F. et al. Whole-exome rare variant analysis of Alzheimer's disease and related biomarker traits. Alzheimer's & Dementia (2022).
- Neumann, A., Küçükali, F. et al. Rare variants in IFFO1, DTNB, NLRC3 and SLC22A10 associate with Alzheimer's disease CSF profile of neuronal injury and inflammation. Molecular Psychiatry (2022).
- De Roeck A, Duchateau L, et al**.** An intronic VNTR affects splicing of ABCA7 and increases risk of Alzheimer's disease. Acta Neuropathologica (2018).
- Cuyvers E, Sleegers K. Genetic variations underlying Alzheimer's disease: evidence from genome-wide association studies and beyond. Lancet Neurology (2016).
- Cuyvers E, De Roeck A, et al. Mutations in ABCA7 in a Belgian cohort of Alzheimer's disease patients: a targeted resequencing study. Lancet Neurology (2015).

ALTERNATIVE SPLICING AND MICROGLIA GENETICS





Sierksma et al. 2020, EMBO Mol Med

Can Alzheimer risk variants and **alternative splicing** affect **microglia** function in Alzheimer's disease?

SCIENCE MEETS LIFE