

# Esther Bron

## ***Modeling disease progression in genetic frontotemporal dementia***

Frontotemporal dementia (FTD) shows diverse clinical manifestations with severe behavioral changes over the course of the disease which relate to high caregiver burden and hampers care planning. Brain imaging, as well as cognitive tests and fluid biomarkers, has shown added value on a group level in both genetic and sporadic frontotemporal dementia. However, these markers lack specificity and there is an urgent need for strategies at an individual level predicting disease onset and progression. Such strategies may be provided by artificial intelligence (AI) techniques that extract patterns from a combination of clinical, neuroimaging and fluid data of a large (inter-)national longitudinal studies of mutation carriers.

Dr. Bron and her team have previously developed the discriminative event-based model (DEBM), which describes the change of multi-modal biomarkers as the disease evolves, is entirely data-driven, and outputs a fine-grained disease stage for each patient. A strong advantage is its interpretability as the model will not only give a disease stage for each subject that can be used for prediction, but will also output the order of biomarker changes derived from the data and how prominent these are in each individual. This has previously indicated language-related markers and neurofilament light-chain to be among the first biomarkers to become abnormal in genetic FTD (Panman et al., 2021; van der Ende et al., 2021). In this talk, Dr. Bron will discuss the results of these analyses and expand on the future promises for AI models in the field of FTD.

