CoSTREAM

UNDERSTANDING STROKE AND ALZHEIMER

CoSTREAM: COMMON MECHANISMS AND PATHWAYS IN STROKE AND ALZHEIMER'S DISEASE

The EU-funded project CoSTREAM aims to identify common mechanisms and pathways of stroke and Alzheimer's disease to improve our understanding of their link, investigate therapeutic targets and develop promising organ-on-a-chip in vitro model with potential to revolutionise drug-development.

It has long been recognised that stroke and Alzheimer's disease often co-occur and have an overlapping pathogenesis. An essential concept of the CoSTREAM project is that stroke and AD are sequential diseases with overlapping pathophysiological mechanisms and shared risk factors.

The consortium builds upon an extensive infrastructure of longitudinal follow-up studies; these studies have data on both diseases as separate clinical outcomes and contain information on a broad range of factors implicated in causing stroke or Alzheimer's, ranging from genetic and metabolic to brain structure and function.

CoSTREAM's multidisciplinary approach combines epidemiology, genetics, metabolomics, clinical prediction, and brain imaging. The project incorporates novel analytical strategies and emerging technologies in these fields, such as Mendelian randomisation, ultra-high field 7T MRI, amyloid- and Tau-PET, and state-of-the-art targeted and untargeted metabolomics.

In addition to improving our understanding of both diseases and their link, CoSTREAM will develop a promising "organ-on-a-chip" in vitro model of the neurovascular unit – the site of the anatomical barrier between blood vessels and brain cells – using commercially available cell lines and patient-derived stem cells. An *in vitro* model like this can potentially revolutionise the development of targeted therapeutic strategies against stroke or Alzheimer's disease by providing a model to rapidly investigate molecular pathways, such as the ones identified during the project, or test drugs, in a highly relevant in vitro setting.

CoSTREAM's innovative, multidisciplinary approach impressed reviewers of the EU Horizon 2020 research programme, who awarded the project proposal the highest evaluation score possible.

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CONSORTIUM

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