Understanding stroke, vascular dementia and cognitive aging through new techniques and models for assessment of cerebral blood flow and cerebrospinal fluid dynamics

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Country

Sweden

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Understanding stroke, vascular dementia and cognitive aging through new techniques and models for assessment of cerebral blood flow and cerebrospinal fluid dynamics

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4

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Research Abstract
The biofluid mechanics of the central nervous system describes the flows and pressures of blood and cerebrospinal fluid (CSF). The field provides a platform for understanding the pathophysiology of neurological disorders with disturbances in blood supply and/or intracranial

pressure. Often, the full understanding of such pathophysiology has been limited by the lack of sufficiently advanced measurement techniques, or a narrow approach to the analysis, neglecting the complicated interactions between the biofluid systems of the body The main purpose of this project is to develop analysis techniques for characterization of the craniospinal biofluid mechanics, to improve diagnostics, and treatment planning of STROKE and dementias. We plan to accomplish this by development of a comprehensive mathematical model, synthesizing knowledge about craniospinal hemodynamics and CSF dynamics, and clinical studies of patients and healthy using advanced MRI flow measurements and invasive CSF infusion tests. New analysis methods will be used to define biomarkers characterizing the biofluid mechanics, and investigate how they are altered in these VERY COMMON neurological disorders. The findings of this project, accomplished with a comprehensive theoretical approach and advanced measurement techniques, will generate improved pathophysiological understanding that will have significance for both medical research and clinical use in stroke and dementia.

Further information available at:

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Investments < €500k

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