Cerebral blood volume mapping software for diagnosis and monitoring of brain disorders

Technology #cu14249

This technology is an fMRI software toolkit that quantitatively maps cerebral blood volume (CBV) for diagnosis, drug discovery, and drug efficacy testing.

Unmet Need: Simple, non-invasive brain imaging method that reveals brain physiology

Cerebral blood volume, a variant of functional magnetic resonance imaging (fMRI), is useful for measuring brain physiology and pathophysiology. Abnormal CBV can be used to predict conversion to advanced forms of psychiatric disease and aid in the diagnosis of neurological disorders. While software tools that use structural scans of the brain to generate CBV values exist, they are restricted to the hippocampal and ventricular regions. As such, there is a need for software tools that map CBV and associated statistics in multiple regions of the brain.

The Technology: Semi-automated software produces a functional map of multiple brain regions and quantifies cerebral function based on CBV

This technology is an fMRI software toolkit that enables semi-automated generation of CBV maps. Pre- and post-contrast MRI images of the brain are used to output a CBV map in anatomic space. The CBV values calculated by this technology may then be used for applications ranging from clinical diagnostics to monitoring therapeutic efficacy for drug development research. This technology is compatible with existing MRI equipment and can be easily implemented in MRI centers, and provides clinicians with an additional method for identifying and monitoring psychiatric and neurological disorders.

This technology has been used to identify and image regions of the brain implicated in preclinical Alzheimer’s disease.
Applications:

- Diagnosis of cerebral pathologies
- Monitoring changes in cerebral health
- Predicting patients at risk for advanced forms of psychiatric disease
- Drug discovery, monitoring, and efficacy testing
- Neurology research of the cellular and molecular pathways involved in cerebral pathologies

Advantages:

- Semi-automated program for calculation of cerebral blood volume from fMRI images
- Generates a functional map of multiple regions in the brain
- Calculates statistics to quantify brain function
- Can be run on any Linux computer with MATLAB and modest hardware (>2 GHz quad core, 16 GB RAM, 500 GB hard drive)
- Can be easily implemented in existing MRI facilities

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Patent Information:

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Related Publications:


Tech Ventures Reference:

- IR CU14249
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