Black Blood MRI: Novel Imaging Marker of Small Vessel Disease

USC Case # 2017-168

Market Opportunity:

Approximately 47 million people worldwide have dementia, and there are 9.9 million new cases every year. Dementia can be caused by cerebral small vessel disease (SVD). There are no clinical guidelines for the prevention and treatment of SVD because cerebral small vessels are inaccessible to existing imaging technologies. Furthermore, the current markers of SVD are inadequate because they fail to show changes at the microvascular level and only provide information late -- at a point when timely intervention is impossible. Therefore, in many cases SVD is not treated or is under treated because doctors have no way of visualizing these small vessels. A technique for visualizing small vessels is needed so that doctors can accurately diagnose patients at an early stage.

USC Solution:

USC researchers have developed a noninvasive technique that allows doctors to visualize images of very small arteries, arteries with diameters as small as 200 microns. The technique uses high resolution black blood magnetic resonance imaging (MRI), advanced segmentation and shape analysis algorithms for imaging and characterizing cerebral small vessels of the brain.

Value Proposition

- Imaging marker of cerebral small vessel disease for clinical trials of small vessel disease (SVD)
- Early diagnosis of dementia and cerebrovascular disorders for timely intervention
- Enriched imaging functionality for MRI vendors and imaging based CROs

Keywords:

Small vessel disease, black blood MRI, dementia, stroke, imaging
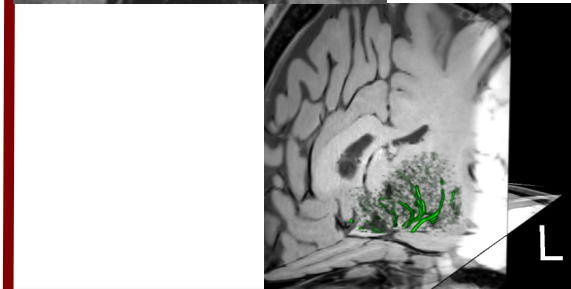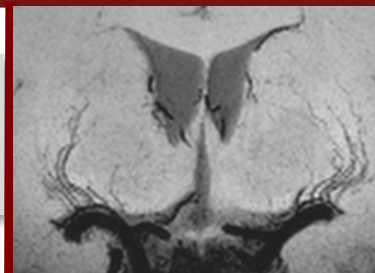
Applications

- Clinical trials of SVD
- Early diagnosis and management of SVD

Stage of Development

- Feasibility demonstrated
- Prototype software developed
- Ongoing clinical studies
- Available for exclusive and non-exclusive license

Intellectual Property

Status:
Provisional Number: 62/485,313

Key Publications:
SJ Ma et. al., "T1-weighted Turbo-Spin Echo for visualization of human lenticulostriate arteries at 3T" Proc. ISMRM 2017 p2565

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