Beyond perfusion: measuring water transport across brain barriers with arterial spin labeling MRI

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Stellingen behorende bij het proefschrift getiteld “Beyond Perfusion: Measuring Water Transport Across Brain Barriers with Arterial Spin Labeling MRI”

1. The advantages of T_{2prep} ASL as a blood-brain-barrier (BBB) assessment technique, such as its non-invasiveness and use of water as an endogenous tracer, outweigh the disadvantages associated with low signal-to-noise ratio. (this thesis)

2. The choroid plexus is not the sole site of blood-to-cerebro-spinal fluid (CSF) water exchange and extrachoroidal sources should be considered when measuring CSF production. (this thesis)

3. A CSF contribution should be included in partial volume correction analysis of ASL signal as it is a simple extension of the algorithm which improves quantification. (this thesis)

4. Combined T_{2prep} and multi-echo imaging has the potential to measure both blood-to-tissue and blood-to-CSF water transport resulting in a more global understanding of water exchange in the brain. (this thesis)

5. Absolute quantification of perfusion with ASL is not as useful as relative measurements between brain regions and through time.

6. Contradicting data suggests a complex and non-linear relationship between BBB function and aging, and there is a need for in-depth longitudinal studies to explain this.

7. There is sufficient evidence against the third circulation theory of CSF flow to discredit it and future research should present and test novel hypotheses.

8. The focus on the study of production of CSF is limiting our global understanding of the complex nature of water exchange processes in the brain.

9. The scientific publishing industry’s business model is harmful to science as it limits progress and hinders international collaboration.

10. Global capitalism is the principal driver of climate change which will lead humanity to extinction if it is not replaced with a new system.