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## **The iron brain: Post-mortem and in vivo imaging of iron in brain diseases**

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# Stellingen

behorende bij het proefschrift getiteld

## The Iron Brain: Post-mortem and in vivo imaging of iron in brain disease

1. Depending on the application, a simple  $T_2^*$ -weighted image is preferred over an average regional quantitative MRI value as it contains information on the spatial distribution patterns within a specific region.  
*Chapter 2 of this thesis.*
2.  $T_2^*$ -weighted MRI is not a simple proxy for just iron nor amyloid in Alzheimer's disease; it is the sum of several components, like iron associated with myelin, A $\beta$ , tau and microglia, that together form the final image.  
*Chapter 3 of this thesis.*
3. Although iron accumulation is a shared mechanisms among neurodegenerative diseases, depending on the disease and the brain area involved, iron is associated with (disease) specific pathological phenomena.  
*Chapter 3, 4 and 5 of this thesis.*
4. Correlating MRI findings with specific cerebrospinal fluid markers is necessary to obtain in vivo evidence on how susceptibility-based MRI is related to brain iron levels, neuroinflammation and disease progression in neurodegenerative diseases.  
*Chapter 6 of this thesis.*
5. As proposed by Moller et al., optimizing and standardizing acquisition protocols across different magnetic field strengths and vendor platforms as well as image processing software will be essential for obtaining more robust biomarkers.  
*Moller et al. Trends in Neuroscience (2019)*
6. Multi-modal approaches will remain extremely valuable as MRI is currently limited by its inability to measure absolute iron concentrations and intracellular localization of iron.
7. In order to develop therapeutic strategies targeting the early disease stage, it is fundamental to understand "which" are the biological pathways involved and "when" they are involved.  
*Adapted from Aloma et al. Alzheimer's & Dementia (2020)*
8. When standard protocols and equipment for MRI scanning of brain specimens are lacking, one should use their own creativity and not underestimate the potential value of do-it-yourself products from local shops.
9. Linking neuro-imaging findings to neurobiology should always be an interdisciplinary enterprise.
10. You can't always get what you want. But if you try sometimes, you get what you need.  
*Adapted from Rolling Stones, 1969*