Chapter 17

Acknowledgements
As probably became clear while reading the thesis, is that I engulfed myself in literature regarding both PET and MRI. This is mainly due to the finalization of the scanning acquisition of the first part of my project midway the third year of my PhD, and the 2 months later finalization of the longitudinal study. Therefore, meanwhile the data acquisition, I devoted my time figuring out the practical procedures on how to do all the analysis and acquiring the theoretical knowledge necessary for optimization of the analytical procedures. Nonetheless, I hope I haven’t bored you too much up until this point, and, as usual, this section should be a bit more lightweight.

As perhaps valid throughout my PhD, I seem to cohere with the famous quote:

“It’s about the journey, not about the destination”

As my supervisors, Erik and Jan, most likely can tell you all about, as soon as I figured out how something worked, I immediately thought about improvements and about what to do next, and thus immediately about the start of my next journey. While for me, all the choices were rather clear and the path how to proceed next seemed logical, during our discussions it took a lot of effort to convince Erik and Jan, which supposedly was on purpose to constrain my enthusiasm thereby guiding me towards the best journey. Therefore, I would like to thank them for giving me the liberty and opportunity to explore and think outside the box, harnessing me with the necessary tools, and aiding me with the right track.

“A day without laughter is a wasted day.”

While working in a highly international office, it may be challenging to connect with people as they are all used to different customs, habits, and beliefs. For me, comedy and humour was always an import aspect in my life, with a strong interest in action-comedy movies starring Eddie Murphy during my childhood. During my studies, which I did mostly abroad, I discovered that humour is an essential part which is shared among people irrespective of their customs, habits, and beliefs. I would even go to that extent, that I think that when you share the first laugh with someone, that that is the point that you connect with someone. Therefore, I also tried to incorporate this in my professional life, that no matter how complicated the material, try to make it as lightweight as possible due to the integration of humour.

“Man must evolve for all human conflict a method which rejects revenge, aggression, and retaliation. The foundation of such a method is love.”
Furthermore, due to living abroad and working with internationals, I experienced many people from different cultures, and I noticed that although all these cultures have their own unique manners and customs, no culture is either better or worse than the other, they are just different. The most important thing is to understand the differences and respect them.

“Courage is not the absence of fear, but the triumph over it. The brave man is not he who does not feel afraid, but he who conquers that fear.”

Now we came to the point of acknowledging the contributions that lead to this thesis. Above all, I would like to thank all the volunteers that participated in the study. Without them this work would per definition not be possible. Your participation, enthusiasm, and interest in this study is most appreciated. I would not be able to display my gratitude enough for your efforts to participate in this study. At this point, I would like to thank Thea, Jan, and Grunn Moves for their aid in identifying these amazing volunteers, which, of course, should not be underestimated, as both the participation and identification of volunteers is an essential part for enabling the work in this thesis.

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References

34. Han, X., Holtzman, D. M. & McKeel Jr, D. W. Plasmalogen deficiency in early Alzheimer’s disease


77. Ichise, M., Kimura, Y., Shimada, H., Higuchi, M. & Suhara, T. PET Quantification in Molecular Brain Imaging Taking into Account the Contribution of the Radiometabolite Entering the Brain. in *Perspectives on Nuclear Medicine for Molecular Diagnosis and Integrated Therapy* 219–228 (Springer, Tokyo, 2016).


200. Liu, T. et al. Nonlinear formulation of the magnetic field to source relationship for robust


266. Laule, C. et al. Myelin water imaging in multiple sclerosis: Quantitative correlations with


283. Bagnato, F. *et al.* Selective inversion recovery quantitative magnetization transfer brain MRI


328. Parlak, S. et al. Reduced myelin in patients with isolated hippocampal sclerosis as assessed by
REFERENCES


363. Cherry, S. R., Sorenson, J. A. & Phelps, M. E. *Physics in nuclear medicine e-Book*. (Elsevier...


397. Andersson, J. L. R., Graham, M. S., Zsoldos, E. & Sotiropoulos, S. N. Incorporating outlier


400. Dhollander, T., Raffelt, D. & Connelly, A. Unsupervised 3-tissue response function estimation from single-shell or multi-shell diffusion MR data without a co-registered T1 image. in *ISMRM Workshop on Breaking the Barriers of Diffusion MRI* **5**, (ISMRM Lisbon, Italy, 2016).


413. Singh, S. *et al.* Relationship of acute axonal damage, Wallerian degeneration, and clinical


469. Sombekke, M. H. *et al.* Genetic correlations of brain lesion distribution in multiple sclerosis: an


504. Politis, M. *et al.* Increased PK11195 PET binding in the cortex of patients with MS correlates...


Möhler, H. Role of GABAA receptors in cognition. (2009). doi:10.1042/BST0371328


Kindred, J. H., Koo, P. J. & Rudroff, T. Glucose uptake of the spinal cord in patients with multiple


617. Lapointe, E., Li, D. K. B., Trabousee, A. L. & Rauscher, A. What have we learned from perfusion


635. Ghorbani, S. & Yong, V. W. The extracellular matrix as modifier of neuroinflammation and


149 (2008).


667. van Horssen, J., Bö, L., Vos, C. M. P., Virtanen, I. & de Vries, H. E. Basement membrane proteins in multiple sclerosis-associated inflammatory cuffs: potential role in influx and transport of


734. Mouihate, A. & Kalakh, S. Ganaxolone enhances microglial clearance activity and promotes


