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Microcoil MRI of plants and algae at ultra-high field : an exploration of metabolic imaging

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PUBLICATIONS

Augustijn, D., Roy, U., **van Schadewijk, R.**, de Groot, H.J.M., & Alia, A. (2016). Metabolic Profiling of Intact *Arabidopsis thaliana* Leaves during Circadian Cycle Using ^1H High Resolution Magic Angle Spinning NMR. *PloS one*, 11(9), e0163258.

van Schadewijk, R., van den Berg, T.E., Gupta, K.B.S.S., Ronen, I., de Groot, H.J.M. & Alia, A. (2018). Non-invasive magnetic resonance imaging of oils in *Botryococcus braunii* green algae: Chemical shift selective and diffusion-weighted imaging. *PloS one*, 13(8), e0203217.

van Schadewijk, R., Krug, J.R., Shen, D., Sankar Gupta, K.B.S., Vergeldt, F.J., Bisseling, T., Webb, A., van As, H., Velders, A.H., de Groot H.J.M., Alia, A. (2020). Magnetic Resonance Microscopy at cellular resolution and Localised Spectroscopy of *Medicago truncatula* at 22.3 T. (Submitted)

van Schadewijk, R., Krug, J.R., Webb, A., van As, H., Velders, A.H., de Groot, H.J.M., Alia, A. (2019). Ultra-High Field Magnetic Resonance Microscopy using Microcoils: coil performance calibration and usage demonstrated on *Medicago truncatula* roots. *Scientific Reports* 10, 971.

Krug J., **van Schadewijk, R.**, Shen, D., Bisseling, T., Webb, A., de Groot H.J.M., Alia, A, van As, H., Velders A.H. (2019). Signal-to-noise ratio increase at 22.3 T - Perspectives to ultra-high-field NMR microscopy. (Submitted)

CURRICULUM VITAE

My name is Remco van Schadewijk. I was born on the 12th of August 1988 in Lisse, The Netherlands. After finishing gymnasium in 2007, I started my Bachelors in Life Science & Technology at the Delft University of Technology and Leiden University. In 2014 I graduated *cum laude* from the Master Life Science & Technology in Leiden. During my master I directed and produced 'The Dreamgazer', an educative children's film utilising participative writing, for my specialisation in Science Communication & Society.

I started doctoral research on plants and algae using Magnetic Resonance Imaging (MRI) in 2014, at the Solid State NMR group of the Leiden Institute of Chemistry under the supervision of Prof. Dr. A Alia and Prof. Dr. Huub J.M. de Groot. As part of my teaching duties I initiated and produced the educational fiction film 'On Being a Scientist', which was a part of a MOOC on scientific integrity. In 2019 I took up a position as a consultant multimedia at the KU Leuven, Belgium.

My work has been presented at various conferences and symposia: presented orally as well as posters at the BioSolar Cells Annual Meetings (2013, 2014, 2015, 2016) in Ede-Wageningen, The Netherlands. Poster presentation at the 6th Symposium on Ultrahigh Field MR (2015), in Berlin, Germany. Presented posters at BSC meeting and 51st meeting of the NMR-DG (2016) where I was runner-up for the poster prize and presented a poster at the 52nd meeting of the NMR-DG (2017), Geleen. Oral presentation at the Media & Learning Conference (2018, 2019) in Leuven, Belgium. Nomination for MEDEA award 2018.

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