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Microstructural and metabolic alterations in the zebrafish brain induced by toll-like receptor 2 deficiency: insights from ultra-high field magnetic resonance imaging and spectroscopy

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Citation

Singer, R. (2025, March 25). *Microstructural and metabolic alterations in the zebrafish brain induced by toll-like receptor 2 deficiency: insights from ultra-high field magnetic resonance imaging and spectroscopy*. Retrieved from <https://hdl.handle.net/1887/4208928>

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Microstructural and Metabolic Alterations in the Zebrafish Brain Induced by Toll-Like Receptor 2 Deficiency

Insights from Ultra-High Field Magnetic
Resonance Imaging and Spectroscopy

Rico Singer

Cover illustration: Ward van Zeijl
Layout: Susanne Ottenheym
Printing: Ridderprint, The Netherlands

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Microstructural and Metabolic Alterations in the Zebrafish Brain Induced by Toll-Like Receptor 2 Deficiency

Insights from Ultra-High Field Magnetic
Resonance Imaging and Spectroscopy

Proefschrift

ter verkrijging van
de graad van doctor aan de universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
ter verdediging op dinsdag 25 maart 2025
klokke 13:00 uur

door

Rico Singer

geboren te 's-Gravenhage, Nederland
in 1993

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LIST OF ABBREVIATIONS

ABBREVIATIONS	DEFINITION
ADC	Apparent diffusion coefficient
ADHD	Attention deficit hyperactivity disorder
Ala	Alanine
Asp	Aspartate
Cans	Ansulate commissure
CB	Cerebellum
CCeg	Granular layer of the cerebellar corpus
CCem	Molecular layer of the cerebellar corpus
Cgus	Commissure of the secondary gustatory nuclei
Cho	Choline
Chol	Cholesterol
CNR	Contrast-to-noise ratio
CNS	Central nervous system
CPMG	Carr-Purcell Meiboom-Gill
Cpost	Posterior commissure
CSD	Constraint spherical deconvolution
CSF	Cerebrospinal fluid
CT	Computed tomography
Cven	Ventral rhombencephalic commissure
CW	Continuous wave
$D_{\parallel}$	Axial diffusivity
$D_{\perp}$	Radial diffusivity
DALY	Disability-adjusted life year
DAMP	Danger-associated molecular pattern
DC	Diencephalon
DEC	Directional encoded colour
DIL	Diffuse nucleus of the inferior lobe
DKI	Diffusion kurtosis imaging

DM	Medial zone of dorsal telencephalon
dMRI	Diffusion-based magnetic resonance imaging
DTI	Diffusion tensor imaging
DW	Diffusion weighted
DWI	Diffusion-weighted imaging
EPI	Echo-planar imaging
ETL	Echo train length
FA	Fractional anisotropy
FID	Free-induction decay
fODF	Fibre orientation distribution functions
FOV	Field of view
GABA	γ -aminobutyric acid
G_{diff}	Diffusion gradient
G_f	Frequency encoding gradient
Gln	Glutamine
Glu	Glutamate
GM	Grey matter
G_p	Phase encoding gradient
G_s	Slice encoding gradient
HR-MAS	High-resolution magic angle spinning
ISIS	Image selected <i>in vivo</i> spectroscopy
$K_{\parallel}$	Axial kurtosis
$K_{\perp}$	Radial kurtosis
KFA	Kurtosis Fractional anisotropy
KO	Knock-out
Lac	Lactate
LASER	Localization by adiabatic selective refocusing
LLF	Lateral longitudinal fascicle
MC	Mesencephalon
MD	Mean diffusivity
m-Ins	Myo-inositol
MK	Mean kurtosis
MLF	Medial longitudinal fascicle

MRI	Magnetic resonance imaging
MRS	Magnetic resonance spectroscopy
MSME	Multi-slice multi-echo
msmt	Multi-shell multi-tissue
NAA	N-acetylaspartate
NAAG	N-acetylaspartyl-glutamate
NMR	Nuclear magnetic resonance
OB	Olfactory bulb
OT	Optic tract
OVS	Outer volume suppression
PA	Pallium
PAMP	Pathogen-associated molecular pattern
pCho	Phosphocholine
PRESS	Point resolved spectroscopy
PRR	Pattern recognition receptors
RARE	Rapid acquisition with relaxation enhancement
RC	Rhombencephalon
RF	Radio frequency
ROI	Region of interest
SNR	Signal-to-noise ratio
STEAM	Stimulated echo acquisition mode
stTDI	Short-track track-density imaging
T	Tesla
T_1	Longitudinal relaxation time
T_2	Transverse relaxation time
Tau	Taurine
tBW	Transmission bandwidth
tCr	Total creatine
TE	Echo time
TeO	Optic tectum
TL	Longitudinal torus
TLR	Toll-like receptor
TR	Repetition time

UHF	Ultra-high field
WM	White matter
WS	Water suppression
YLD	Years lived with disability