

Curriculum Vitae

Date Prepared: January 2nd, 2021
Name: Johanna Seitz-Holland
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Place of Birth: Munich, Germany

Education:

2009-2012	B.Sc.	Psychology	Ludwig-Maximilians-Universität, München
2012-2019	M.D.	Medicine	Technische Universität, München
2014-2020	Dr. med. (Ph.D.)	Neuroimaging/Psychiatry (Prof. Inga K. Körte)	Ludwig-Maximilians-Universität, München

Postdoctoral Training:

2019-present	Postdoctoral Research Fellow	Neuroimaging/Psychiatry (Prof. Marek Kubicki)	Harvard Medical School
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Appointments at Hospitals/Affiliated Institutions:

2019-present	Postdoctoral Research Fellow	Psychiatry	Brigham and Women's Hospital
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Other Professional Positions:

2010-2011	Research Assistant	Department of Psychology, Ludwig-Maximilians- Universität, München
2014-2015	Research Trainee	Department of Psychiatry, Harvard Medical School
2016	Research Assistant	Department of Neuroradiology, Technische Universität, München

Professional Societies:

2020-present	Schizophrenia International Research Society	Member
2020-present	Society of Biological Society	Member
2020-present	German Association for Psychiatry, Psychotherapy, and Psychosomatics	Member

Editorial Activities:

Ad hoc Reviewer

Neuropsychopharmacology
Psychiatry & Clinical Psychopharmacology
Schizophrenia Research

Honors and Prizes:

2008	Stipend	Deutsche Schülerakademie	Academic excellence
2009-2012	Dean's List	Ludwig-Maximilians-Universität, München	Academic excellence
2011-2012	Max Weber Award	Elite Network in Bavaria, Germany	Academic excellence
2016	Travel Award	5th Biennial Schizophrenia International Research Society Conference	
2016	Presentation Award	27th European Student's Conference	
2019	Momente program	Ludwig-Maximilians-Universität, München	Prestigious career development award given to excellent female junior researchers on their path for professorship
2020	Hans-Heimann Preis	German Association for Psychiatry, Psychotherapy, and Psychosomatics	Best doctoral thesis award
2021	Travel Award	Society of Biological Psychiatry	

Report of Local Teaching and Training

Teaching of Students in Courses:

2020	Introduction to statistical methods Research Assistants/ Bachelor Students	Brigham and Women's Hospital 5 hours
2020	Methodology for neuroimager Medical students	Ludwig-Maximilians-Universität, München 1 hour/ week for one semester

Research Supervisory and Training Responsibilities:

2016-2019	Mentorship Research Assistants	Ludwig-Maximilians-Universität, München Daily mentorship
2019-2020	Mentorship Research Assistants, US pre-doctoral students, international pre-doctoral students, international medical students, international doctors	Brigham and Women's Hospital Daily mentorship

Other Mentored Trainees and Faculty:

2019-2020	Mina Langhein – Visiting Medical Student from University Medical Center Hamburg-Eppendorf, Hamburg Will publish two first-author publications and complete her medical thesis
2019-present	Philine Rojczyk – Visiting PhD Student from Ludwig-Maximilians-Universität, München Will publish two first-author publications and complete her PhD thesis
2019	Maria Paula Maziero – Visiting Medical Student from University of Sao Paulo Medicine Scinicas HCFMUSP, Sao Paulo Presented at Biological Psychiatry Annual Meeting, will publish one first-author publications and complete her medical thesis
2019	Magdalena Seethaler – Visiting doctor from Psychiatric University Hospital Charité at St. Hedwig Hospital, Berlin Presented at 2020 Schizophrenia International Research Society Conference, will publish one first-author publication
2020	Olcay Senay Sahin – Visiting doctor from Istanbul University, Istanbul Will publish one first-author publication
2020-present	Katrina Hon– Bachelor student from Harvard Medical School, Boston Will write her bachelor thesis
2020-present	Birukti Tsige– Bachelor student from Harvard Medical School, Boston

Will write her bachelor thesis

Local Invited Presentations:

No presentations below were sponsored by 3rd parties/outside entities

- 2014 Presentation of thesis work
Psychiatry Neuroimaging Laboratory, Boston, MA
- 2016 Frühe Mikrostrukturelle Gehirnveränderung bei Schizophrenie
Child and adolescent psychiatry, Ludwig-Maximilians-Universität, Munich (Invited speaker)

Report of Regional, National and International Invited Teaching and Presentations

No presentations below were sponsored by 3rd parties/outside entities

National

- 2020 White matter abnormalities in the 22q11.2 deletion and duplication syndrome
University of California, Los Angeles (Invited speaker via Zoom)

International

- 2016 Heterogeneity - a novel way to study microstructural gray matter organization in schizophrenia?
5th Biennial Schizophrenia International Research Society Conference, Florence (selected presentation)
- 2016 White matter alterations and their clinical correlates in early course schizophrenia
27th European Students' Conference, Berlin (selected presentation)
- 2016 Using diffusion imaging to explore the anatomic nature of early course schizophrenia
Sechenov First Moscow State University, Moscow (Invited speaker via Skype)
- 2019 Sexual dimorphism in the human brain
Child and adolescent psychiatry, Ludwig-Maximilians-Universität, Munich (Invited speaker)

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. **Seitz J**, Zuo JX, Lyall AE, Makris N, Kikinis Z, Bouix S, Pasternak O, Fredman E, Duskin J, Niznikiewicz M, Nestor P, Goldstein JM, Petryshen TL, Mesholam-Gately RI, Wojcik J, McCarley RW, Seidman LJ, Shenton ME, Koerte I, Kubicki M. Tractography analysis of five white matter bundles and their clinical and cognitive correlates in early course schizophrenia. *Schizophrenia Bulletin*. (2016) May;42(3):762-71. PMID: [27009248](#). PMCID: [PMC4838095](#).
2. **Seitz J**, Sawyer KS, Ruiz SM, Papadimitriou G, Ng I, Kubicki A, Mouradian P, Oscar Berman M, Kubicki M, Harris GJ, Makris N: Alcoholism and Sexual Dimorphism in the middle longitudinal fascicle: a pilot study. *Brain Imaging and Behavior*. (2016). Aug;11(4):1006-1017. PMID:[27448160](#). PMCID: [PMC5253343](#).
3. **Seitz J**, Lyall AE, Kanayama G, Makris N, Hudson JI, Kubicki M, Pope HG Jr, Kaufman MJ. White matter abnormalities in long-term anabolic-androgenic steroid users: A pilot study. *Psychiatry Res Neuroimaging*. (2017). Feb 28;260:1-5. PMID: [27988413](#). PMCID: [PMC5272808](#).
4. **Seitz J**, Rathi Y, Lyall A, Pasternak O, del Re EC, Niznikiewicz M, Nestor P, Seidman LJ, Petryshen T L, Mesholam-Gately RI, Wojcik J, McCarley RW, Shenton M, Koerte I, Kubicki M: Alterations of gray matter microstructure in schizophrenia. *Brain Imaging Behav*. (2018);12(1):54-63. PMID: [28102528](#). PMCID: [PMC5517358](#).
5. Lyall AE, Savadjiev P, del Re EC, **Seitz J**, O'Donnell L, Seidman LJ, Goldstein J, Mesholam-Gately R, Petryshen T, Wojcik J, McCarley RW, Shenton ME, Kubicki M. Utilizing Mutual Information Analysis to Explore the Relationship Between Gray and White Matter Structural Pathologies in Schizophrenia. *Schizophrenia Bulletin*. (2019). Mar 7;45(2):386-395. PMID: [29618096](#). PMCID: [PMC6403063](#).
6. **Seitz J**, Kubicki M, Jacobs E, Cherkezian S, Weiss B, Papadimitriou G, Mouradian P, Buka S, Makris N, Goldstein J: Impact of Sex and Reproductive Status on Memory Circuitry Structure and Function using Structural Covariance

Analysis. *Human Brain Mapping*. (2019). March;40(4):1221-1233. PMID: [30548738](#). PMCID: [PMC6365200](#).

7. **Seitz J**, Cetin-Karayumak S, Lyall A, Pasternak O, Baxi M, Vangel M, Pearlson G, Tamminga C, Sweeney J, Clementz B, Schretlen D, Viher PV, Stegmayer K, Walther S, Lee J, Crow T, James, A, Voineskos, A; Buchanan RW, Szeszko PR, Malhotra A, Keshavan M, Koerte IK, Shenton ME, Rathi Y, Kubicki M: Investigating Sexual Dimorphism of Human White Matter: A Harmonized, Multisite Diffusion Magnetic Resonance Imaging Study. *Cerebral Cortex*. (2020). Aug 26; PMID: [32851404](#).
8. Baxi M, Di Base M*, Lyall A*, Cetin-Karayumak S, **Seitz J**, Ning L, Makris N, Rosene D, Kubicki M, Rathi Y: Quantifying genetic and environmental influence on gray matter microstructure using diffusion MRI. *Cerebral Cortex*. (2020). Nov 3; PMID: [32676671](#)
9. Del Re EC, Stone WS, Bouix S, **Seitz J**, Zeng V, Guliano A, Somes N, Zhang T, Reid B, Lyall A, Lyons M, Li H, Whitfield-Gabrieli S, Keshavan M, Seidman LJ, McCarley RW, Wang J, Shenton ME, Niznikiewicz MA. Baseline Cortical Thickness Reductions in Clinical High Risk for Psychosis: Brain Regions Associated with Conversion to Psychosis Versus Non-Conversion as Assessed at One-Year Follow-Up in the Shanghai-At-Risk-for-Psychosis (SHARP) Study. *Schizophrenia Bulletin*. (2020). PMID: [32926141](#).
10. **Seitz-Holland J***, Cetin-Karayumak S*, Wojcik J, Lyall A, Levitt J, Shenton M, Pasternak O, Baxi M, Kelly S, Pearlson G, Tamminga C, Sweeney J, Clementz B, Schretlen D, Viher PV, Stegmayer K, Walther S, Lee J, Crow T, James A, Voineskos, A; Buchanan RW, Szeszko PR, Malhotra A, Rathi Y, Keshavan M*, Kubicki M*: Elucidating relationship between brain structure and function in schizophrenia: a multicenter harmonized diffusion tensor imaging study. *Molecular Psychiatry* (in press).
11. **Seitz-Holland J***, Nägele FL*, Lyall AE, Pasternak O, Cho KI, Hough M, Mulert C, Shenton ME, Crow TJ, James ACD, Kubicki M: Shared and Distinct White Matter Abnormalities in Adolescent-Onset Schizophrenia and Psychotic Bipolar Disorder- A Free-Water Imaging Study. *Schizophrenia Bulletin*. (under review).
12. **Seitz-Holland J**, Seethaler M, Makris N, Rushmore J, Cho KIK, Rizzoni E, Vangel M, Sahin OS, Heller C, Pasternak O, Szczepankiewicz FA, Westin CF, Losak J, Ustohal L, Tomandl J, Vojtisek L, Ing PK, Jani, Woo WT, Kasperek T, Kikinis Z, Kubicki M: Matrix metalloproteinase 9 (MMP9) is associated with hippocampal volume and is implicated in schizophrenia: a structural MRI study. *Neuropsychopharmacology*. (under review).
13. **Seitz-Holland J**, Lyons M, Kushan L, Lin A, Villalon-Reina JE, Cho KIK, Zhang F, Billah T, Bouix s, Kubicki M, Barden CE, Pasternak O: White matter microstructure abnormalities in 22q11.2 deletion and duplication carriers. *Translational Psychiatry* (under review).

Non-peer reviewed scholarship in print or other media:

Book Chapter

1. Lyall A, **Seitz J**, Kubicki M: Structural connectivity in Psychosis. In: *Psychotic Disorders: Comprehensive Conceptualization and Treatments*, edited by Tamminga C, van Os J, Reinighouse U, Ivleva E (2020)

Thesis:

“Using diffusion imaging to explore the anatomical nature of early course schizophrenia”, by Johanna Seitz, Ludwig-Maximilians-Universität, München, 01/2020

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings (last 3 years):

1. Berndt M, Bäuml J G, **Seitz J**, Menegeaux A, Baumann N, Avram M, Bratec S M, Breeman L, Zimmer C, Wolke D, Sorg C: **Linking infant regulatory problems, adult behavioral problems, and the allostatic interoceptive system by altered structural connectivity** – Deutsche Gesellschaft für Neuroradiologie, 10/2018, Frankfurt

2. **Seitz J**, Cetin-Karayumak S, Wojcik J, Lyall A, Levitt J, Shenton M, Pasternak O, Baxi M, Kelly S, Pearlson G, Tamminga C, Sweeney J, Clementz B, Schretlen D, Viher PV, Stegmayer K, Walther S, Lee J, Crow T, James A, Voineskos, A; Buchanan RW, Szeszko PR, Malhotra A, Rathi Y, Keshavan M, Kubicki M: **Elucidating relationship between brain structure and function in psychosis a multicenter harmonized diffusion tensor imaging study**, 58th Annual Meeting of the American College of Neuropsychopharmacology, 12/2019, Orlando
3. **Seitz J**, Cetin-Karayumak S, Wojcik J, Lyall A, Levitt J, Pasternak O, Baxi M, Kelly S, Pearlson G, Tamminga C, Sweeney J, Clementz B, Schretlen D, Verena Viher PV, Stegmayer K, Walther S, Lee J, Crow T, James A, Voineskos A, Buchanan RW, Szeszko PR, Malhotra A, Rathi Y, Shenton M, Keshavan M, Kubicki M: **A diffusion tensor imaging study on the relationship between white matter structure and clinical functioning in schizophrenia**; accepted for Mysell Harvard Psychiatry Research Day, 04/2020, Boston
4. Lyons MG, **Seitz J**, Kushan L, Cho KIK, Billah T, Bouix S, Kubicki M, Bearden CE, Pasternak O: **Contrasting Structural and Diffusion MRI Findings in 22q11.2 Deletion and Duplication Syndrome**; accepted for Mysell Harvard Psychiatry Research Day, 04/2020, Boston
5. Seethaler M, **Seitz J**, Makris N, Rushmore J, Cho KIK, Rizzoni E, Heller C, Pasternak O, Szczepankiewicz F, Westin CF, Losak J, Ustohal L, Tomandl J, Vojtisek L, Kudlicka P, Woo TW, Kasperek T, Kikinis Z, Kubicki M: **The Association Between MMP-9 And Choroid Plexus Volume In Schizophrenia**; Schizophrenia International Research Society Conference, 04/2020, online
6. **Seitz J**, Lyons MG, Kushan L, Cho KIK, Billah T, Bouix S, Kubicki M, Bearden CE, Pasternak O: **Reciprocal changes in white matter microstructure in 22q11.2 deletion and duplication syndrome**; Schizophrenia International Research Society Conference, 04/2020, online
7. **Seitz J**, Cetin-Karayumak S, Wojcik J, Lyall A, Levitt J, Pasternak O, Baxi M, Kelly S, Pearlson G, Tamminga C, Sweeney J, Clementz B, Schretlen D, Verena Viher PV, Stegmayer K, Walther S, Lee J, Crow T, James A, Voineskos A, Buchanan RW, Szeszko PR, Malhotra A, Rathi Y, Shenton M, Keshavan M, Kubicki M: **A multicenter harmonized diffusion tensor imaging study on the association of white matter structure and clinical functioning**, Schizophrenia International Research Society Conference, 04/2020, online
8. Maziero MP, Cho KIK, **Seitz J**, Goldenberg J, Shavitt RG, Diniz JB, Cappi C, Mello R, Batistuzzo MC, de Mathis MA, Lopes AC, Miguel EC, Pasternak O, Hoexter MQ: **Greater extracellular free-water and white matter structural abnormalities in Obsessive-Compulsive Disorder: a diffusion tensor imaging study**; Biological Psychiatry Annual Meeting, 04/2020, online
9. **Seitz-Holland J**, Seethaler M, Makris N, Rushmore J, Cho KIK, Rizzoni E, Vangel M, Sahin OS, Heller C, Pasternak O, Szczepankiewicz FA, Westin CF, Losak J, Ustohal L, Tomandl J, Vojtisek L, Ing PK, Jani, Woo WT, Kasperek T, Kikinis Z, Kubicki M: **Matrix metalloproteinase 9, hippocampus, and schizophrenia**, Discover Brigham, 11/2020, online
10. Knyazhanskaya EE, **Seitz-Holland J**, Smedberg D, Conghaile A, Cho KIK, del Re EC, Coleman M, Niznikiewicz M, Shenton ME, DeLisi L, Kubicki K: **Investigation of Limbic White Matter Microstructure and Grey Matter Volume in Patients with Post-traumatic Stress Disorder with and without Psychosis**; Discover Brigham, 11/2020, online
11. **Seitz-Holland J**, Seethaler M, Makris N, Rushmore J, Cho KIK, Rizzoni E, Vangel M, Sahin OS, Heller C, Pasternak O, Szczepankiewicz FA, Westin CF, Losak J, Ustohal L, Tomandl J, Vojtisek L, Ing PK, Jani, Woo WT, Kasperek T, Kikinis Z, Kubicki M: **Matrix metalloproteinase 9 (MMP9) is associated with**

hippocampal volume and is implicated in schizophrenia: a structural MRI study, 59th Annual Meeting of the American College of Neuropsychopharmacology, 12/2020, online

12. **Seitz J**, Wojcik J, Cetin-Karayumak S, Lyall A, Pasternak O, Pearlson G, Tamminga C, Sweeney J, Clementz B, Schretlen D, Verena Viher PV, Stegmayer K, Walther S, Lee J, Crow T, James A, Voineskos A, Buchanan RW, Szeszko PR, Malhotra A, Kelly S, Rathi Y, Shenton M, Keshavan M, Kubicki M: **Cognitive deficits and their association with white matter in schizophrenia**, submitted for Schizophrenia International Research Society Conference, 04/2020, online

Narrative Report

My research's primary focus is to utilize advanced neuroimaging techniques to understand the human brain structure and its role in psychiatric symptoms and cognitive functioning. I am especially interested in the interaction of brain structure/function, physical health, and sex in psychosis. My long-term future goal is to conduct translational research that will increase our understanding of psychiatric disorders and lead to improvements in clinical diagnosis and treatment. While finishing my psychology degree (B.Sc.) from Ludwig-Maximilians-Universität München (LMU) in 2012 (top student of the year), I enrolled in an M.D./Ph.D. program in Munich. I was selected to become 1) a member of the cBRAIN laboratory at the Child and Adolescence Psychiatry Department and 2) in 2014/2015, a research trainee at the Psychiatry Neuroimaging Laboratory at Harvard Medical School. Upon returning to Germany in 2016 to finish my medical degree, I joined the Neuroradiology research core at the Technische Universität München. After an additional 1.5 years of clinical rotations (focusing on psychiatry, psychosomatic, and psychotherapy), I graduated from my M.D. in 2019 with the highest possible grade and finished my Ph.D. in 2020 with summa cum laude honors. In my Ph.D. work, I studied early course schizophrenia using advanced neuroimaging techniques.

To further develop my research skills, I re-joined the Psychiatry Neuroimaging Laboratory in March 2019 as a postdoctoral research fellow under Prof. Marek Kubicki's supervision. My present work concentrates on utilizing diffusion-weighted imaging and advanced statistical modeling to investigate the association between schizophrenia pathophysiology and clinical variables. While a large body of evidence has focused on characterizing abnormal white matter in psychosis, studies investigating: 1) the trajectory of white matter abnormalities over the lifespan; and 2) the dynamic interaction between structural abnormalities and clinical variables (including physical health and blood markers), are sparse. My work also centers on characterizing the influence of sex over the lifespan and the sex-specificity of the relationship between brain structure/function and clinical variables.

My past and current involvement in various projects allowed me to acquire an interdisciplinary set of research tools from imaging, statistics, and medicine. They further resulted in numerous publications in top journals. My significant accomplishments in my area of excellence, investigations, include the price for the best Ph.D. thesis by the German psychiatry association 2020 and a prestigious grant for young female investigators on the track to professorship ("Momente Programm") in 2019. Thus far, I have published seven first-author, three co-author papers, one co-author book chapter. I have three more first-author articles submitted. (7/14 publications directly result from my current work as a postdoctoral research fellow since 03/2019). These include articles in high-ranked psychiatric journals like Schizophrenia Bulletin, Cerebral Cortex, and Nature-Molecular Psychiatry (Impact Factor 12.5). Additionally, I have presented findings from my work as a postdoctoral research fellow at several national and international conference. In August, I was nominated by the Brigham Research Institute as one out of two candidates to apply for the 2021 NIH high-risk, high-award NIH Director's Early Independence Award (currently under review).

I spend approximately 30% of my effort mentoring and co-supervising trainees, research assistants, and volunteers. During the last two years, I have formally mentored or co-mentored several trainees (medical/ Ph.D. students, medical doctors), all of which have already published/presented their work or will publish at least one first-author paper while under my mentorship. Additionally, I provide guidance and support, including statistical training, to three research assistants and two bachelor students who will present their work locally/nationally.

In the future I am planning on continuing to bridge the gap between basic science and clinical work to improve diagnostic and treatment options for individuals with psychiatric disorders.