

## CURRICULUM VITAE

### Priv.-Doz. Dr.med.univ. et scient.med. Marie Spies

Universitätsklinik für Psychiatrie und Psychotherapie  
Klinische Abteilung für Allgemeine Psychiatrie  
Medizinische Universität Wien  
Waehringer Guertel 18-20, 1090 Wien, AT  
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### Persönliches

Geboren: 12.08.1988, Boston, Massachusetts, USA

### Beruflicher Werdegang

- Seit 11/21      Senior Research Fellow  
NEUROIMAGING LABs (NIL)  
Leiter: Univ.Prof. Priv.-Doz. Dr. Rupert Lanzenberger  
Universitätsklinik für Psychiatrie und Psychotherapie  
Klinische Abteilung für Allgemeine Psychiatrie  
Medizinische Universität Wien  
*Leitung Themenbereich: Schnell wirksame Antidepressiva*
- Seit 05/20      Fachärztin für Psychiatrie und Psychotherapeutische Medizin  
Universitätsklinik für Psychiatrie und Psychotherapie  
Klinische Abteilung für Allgemeine Psychiatrie  
Medizinische Universität Wien  
*Funktion: Stationsoberärztin*
- 04/21            Habilitation im Fach Psychiatrie  
Medizinische Universität Wien  
*Thema: „Neuroimaging of psychiatric pathophysiology, treatment, and risk“*
- 04/19 – 09/19    Forschungsaufenthalt  
Neurobiology Research Unit, Center for Integrated Molecular Brain Imaging,  
Rigshospitalet Copenhagen, Denmark  
*Thema: “Determining genetic variant effects on in-vivo human brain serotonin markers”*
- 06/13 – 05/20    Assistenzarztausbildung für Psychiatrie und Psychotherapeutische Medizin  
Universitätsklinik für Psychiatrie und Psychotherapie  
Klinische Abteilung für Allgemeine Psychiatrie  
Medizinische Universität Wien
- Seit 06/13      Research Fellow  
NEUROIMAGING LABs (NIL)  
Leiter: Univ.Prof. Priv.-Doz. Dr. Rupert Lanzenberger  
Universitätsklinik für Psychiatrie und Psychotherapie

Klinische Abteilung für Allgemeine Psychiatrie  
Medizinische Universität Wien

- 10/18 – 03/19      Gegenfach Klinische Pharmakologie  
                                         Universitätsklinik für Klinische Pharmakologie  
                                         Medizinische Universität Wien
- 10/17 – 03/18      Gegenfach Neurologie  
                                         Universitätsklinik für Neurologie  
                                         Medizinische Universität Wien
- 10/15 – 05/20      PSY III Aufbaucurriculum Verhaltenstherapie  
                                         Ärztekammer Wien
- Seit 2015              Klinische Erfahrung psychiatrische IMC
- 2015 – 2020        Assistenzärztin Demenzambulanz  
                                         Universitätsklinik für Psychiatrie und Psychotherapie  
                                         Klinische Abteilung für Allgemeine Psychiatrie  
                                         Medizinische Universität Wien
- 2015 – 2020        Assistenzärztin Ambulanz für Herbst- Winter Depression  
                                         Universitätsklinik für Psychiatrie und Psychotherapie  
                                         Klinische Abteilung für Allgemeine Psychiatrie  
                                         Medizinische Universität Wien

### **Forschungsschwerpunkt**

Erforschung von neurobiologischen Mechanismen die der Depression zugrunde liegen, sowie Wirkmechanismen antidepressiver Therapien, insbesondere rasch wirksamen Therapien (zB Ketamin).  
Methodischer Schwerpunkt ist Neuroimaging.  
PI und/oder Prüferin mehrerer Studien zu diesen Themen

### **Aus- und Weiterbildung**

- 2013-2019              Studium der angewandten medizinischen Wissenschaft, n790 (international: PhD),  
                                         “Clinical Neurosciences” (CLINS)  
                                         Medizinische Universität Wien  
*Thema: “Neuroimaging of the serotonergic system in depression and antidepressant treatment”*  
*Supervisor: Univ.Prof. Priv.-Doz. Dr. Rupert Lanzenberger*  
*Dr. scient.med.: 10/03/19*
- 2006 – 2013              Studium der Humanmedizin, n202  
                                         Medizinische Universität Wien  
*Dr.med.univ.: 06/13*
- 2012 – 2013              Diplomarbeit  
                                         NEUROIMAGING LABs (NIL)  
                                         Leiter: Univ.Prof. Priv.-Doz. Dr. Rupert Lanzenberger  
                                         Universitätsklinik für Psychiatrie und Psychotherapie

Klinische Abteilung für Allgemeine Psychiatrie  
Medizinische Universität Wien  
*Thema: "The influence of cross-sex hormone therapy on brain activation during the stop signal task measured with ultra high-field 7T fMRI"*

2011 – 2012      Auslandsaufenthalt  
Medizinische Fakultät, Universität Heidelberg, Deutschland  
ERASMUS

### **Preise**

2019              Travel grant, Österreichische Forschungsgemeinschaft, ÖFG

2019              Preis der ÖGPB für Schizophrenie, Österreichische Gesellschaft für Neuropsychopharmakologie und Biologische Psychiatrie, ÖGPB

2019              Rudolf Höfer Publikationspreis, Gesellschaft der Ärzte, Wien, zweiter Preis

2018              Teilnahme (kompetitiv) European College of Neuropsychopharmacology (ECNP) Workshop in Clinical Methodologies, Barcelona, Spain

2016              Researcher of the Month, Medizinische Universität Wien

2015              Poster Prize, 12<sup>th</sup> World Congress of Biological Psychiatry (WFSBP), Athens, Greece

2014              Preis der ÖGPB für klinische Psychiatrie, Österreichische Gesellschaft für Neuropsychopharmakologie und Biologische Psychiatrie, ÖGPB

2014              Preis für beste Presentation, 12<sup>th</sup> YSA PhD Symposium, Medizinische Universität Wien

2014              Travel grant, Österreichische Forschungsgemeinschaft, ÖFG

### **Grants**

#### ***Principle investigator***

2015              Positron emission tomography assessment of ketamine binding of the serotonin transporter and its relevance for antidepressant response  
NARSAD Young Investigator Grant, Brain and Behavior Research Foundation, USA (Nr. 23741)  
€ 58,688.00

#### ***Investigator***

- 2019                    Determining serotonergic genetic variant effects on in-vivo human brain serotonin markers  
Augustinusfonden, Denmark (19-0489)  
PI: Dr. Patrick Fisher, PhD, Neurobiology Research Unit, Rigshospitalet, Copenhagen, Denmark  
€ 13,383.00
- 2016                    Effects of sex steroid hormones on serotonin synthesis and degradation measured with PET  
FWF Austrian Science Fund (KLI 504)  
PI: Univ.Prof. Priv.-Doz. Dr.med. Rupert Lanzenberger, Universitätsklinik für Psychiatrie und Psychotherapie, Medizinische Universität Wien  
€ 330,614.56

## **Lehre**

### ***Planung und Koordination***

- 2018 – 2020            Tertialkoordinatorin „Psychiatrie Tertial“ (5. Studienjahr) Medizinische Universität Wien  
*Projekte: Aktualisierung von Lehrveranstaltungen, Lernunterlagen, und Lerninhalten, Digitalisierung über „Moodle,“ Entwicklung von „Moodle“ Prüfungen und Evaluationsverfahren, Treffen mit VertreterInnen der Medizinischen Universität Wien, StudentInnen Vertretung, und VertreterInnen der Lehrkrankenhäuser zur Verbesserung der Qualität der Lehre*
- 2018 – 2022            Mitglied Planungskommission Block 20 “Psychische Funktionen in Gesundheit und Krankheit” (4. Studienjahr) Medizinische Universität Wien

### ***Seminare, Vorlesungen, Prüfungen***

- Seit 2021                Abhalten von Prüfungen im „Psychiatrie Tertial“ (5. Studienjahr), Medizinische Universität Wien
- Seit 2020                Journal Club im “Clinical Neurosciences” (CLINS) Programm, Studium der angewandten medizinischen Wissenschaft, n790 (international: PhD), Medizinische Universität Wien
- Seit 2020                Objective structured clinical examination testing (OSCE), Block 20, Medizinische Universität Wien
- Seit 2013                Seminare und Lehrveranstaltungen im „Psychiatrie Tertial“ (5. Studienjahr), Medizinische Universität Wien

Seit 2013                    Seminare und Lehrveranstaltungen im Block 20 “Psychische Funktionen in Gesundheit und Krankheit” (4. Studienjahr), Medizinische Universität Wien

### ***DiplomandInnen***

Seit 2017                    *Betreuung von > 10 DiplomandInnen (5 abgeschlossen).*

### **Peer review**

Seit 2021                    Molecular Psychiatry

Seit 2021                    Journal of Affective Disorders Reports

Seit 2021                    Journal of Psychiatry and Neuroscience

Seit 2019                    World Journal of Biological Psychiatry

Seit 2019                    Journal of Psychiatry Research: Neuroimaging

Seit 2017                    Scientific Reports

Seit 2017                    International Journal of Neuropsychopharmacology

Seit 2017                    Journal für Neurologie, Neurochirurgie, und Psychiatrie

2018                         Abstract review 31<sup>st</sup> International College of Neuropsychopharmacology (CINP) World Congress

2017                         Abstract review International College of Neuropsychopharmacology (CINP) Thematic Meeting on Treatment Resistant Depression

### **Vorträge**

#### ***International***

*Preclinical evidence for antidepressant effects (of ketamin)*

Center of Excellence “Therapy Resistant Depression” General Hospital Vienna, October 13 – 14, 2022, Vienna, Austria.

*Preclinical evidence for antidepressant effects (of ketamin)*

Center of Excellence “Therapy Resistant Depression” General Hospital Vienna, June 20 – 21, 2022, Vienna, Austria.

*Stress and the serotonin system*

World Association for the Study of Anxiety Disorders. September 20 – 21, 2022, Vienna, Austria.

*The default mode network and antidepressant response prediction.*

31<sup>st</sup> International College of Neuropsychopharmacology (CINP) World Congress, June 16 – 19, 2018, Vienna, Austria.

*Ketamin in der antidepressiven Therapie (Antidepressant treatment with ketamine).*

Deutsche Bundesdirektorenkonferenz, March 27 – 28, 2018, Greifswald, Germany.

*Stress and the serotonergic system.*

25<sup>th</sup> European Congress of Psychiatry (EPA), April 1 – 4, 2017, Florence, Italy.

*Why do we need a neuroscience-based nomenclature for psychotropic medications in psychiatry?*

17<sup>th</sup> World Congress of Psychiatry (WPA), October 8 – 12, 2017, Berlin, Germany.

*The influence of stress on the serotonergic system, uncovered by PET.*

17<sup>th</sup> World Congress of Psychiatry (WPA), October 8 – 12, 2017, Berlin, Germany.

*A European psychopharmacology curriculum, a young psychiatrist's point of view.*

24<sup>th</sup> European Congress of Psychiatry (EPA), March 12 – 15, 2016, Madrid, Spain.

*Identifying career objectives and making career decisions, women's symposium.*

30<sup>th</sup> International College of Neuropsychopharmacology (CINP) World Congress, July 3 – 5, 2016, Seoul, Republik of Korea.

*(Imaging of ketamine's effects on the serotonin transporter with positron emission tomography Organization for Human Brain Mapping (OHBM) Annual Meeting, June 9 – 13 Rome, Italy.)*

## **National**

*Ketamin als Psychopharmakon*

Verein für Psychiatrie und Neurologie, November 30, 2022, Wien, AT.

*Neue Entwicklungen bei schnell Wirksamen Antidepressiva.*

24 Tagung der Österreichischen Gesellschaft für Neuropsychopharmacology und Biologische Psychiatrie, November 17 – 18, 2022, Wien, AT.

*Einfluss von Ketamin auf die Dynamik der Ruhenetzwerke untersucht mit fMRI.*

Winterseminar Biologische Psychiatrie, März 16 – 20, 2019, Oberlech, AT.

*Neuentwicklungen der antidepressiven Psychopharmakotherapie.*

Psychiatrie in Wissenschaft und Praxis, Februar 23, 2019, Wien, AT.

*Aktuelle Entwicklungen - Ketamin in der antidepressiven Therapie.*

20 Tagung der Österreichischen Gesellschaft für Neuropsychopharmacology und Biologische Psychiatrie, November 22 – 23, 2018, Wien, AT.

*Psychiatrische Problemvorstellung bei der Geschlechtsdysphorie.*

Wissenschaftsseminar der Universitätsklinik für Psychiatrie und Psychotherapie, Juli 6, 2018, Wien, AT.

*Psychotherapeutische Medikation bei depressiven Erkrankungen.*

State of the Art Psychiatrie, Mai 6, 2017, Wien, AT.

*Einfluss der Lichttherapie auf die Monoaminoxidase A erfasst mittels PET.*  
Winterseminar Biologische Psychiatrie, März 17 – 21, 2018, Oberlech, AT.

*Ketamin in der klinischen Praxis.*  
19 Tagung der Österreichischen Gesellschaft für Neuropsychopharmacology und Biologische Psychiatrie, November 9 – 10, 2017, Wien, AT.

*Psychotherapeutische Medikation bei depressiven Erkrankungen.*  
State of the Art Psychiatrie, Mai 6, 2017, Wien, AT.

*Die Binding von Ketamin am Serotonintransporter als potentieller antidepressiver Mechanismus.*  
Winterseminar Biologische Psychiatrie, März 18 – 22, 2017, Oberlech, AT.

*Neuroimaging bei Transidentität.*  
18 Tagung der Österreichischen Gesellschaft für Neuropsychopharmacology und Biologische Psychiatrie, November 3 – 14, 2017, Wien, AT.

*Transgender Projekt am AKH: Modell zur Erforschung des Einflusses von Geschlechtshormonen auf das menschliche Gehirn.*  
17 Tagung der Österreichischen Gesellschaft für Neuropsychopharmacology und Biologische Psychiatrie, November 12 – 13, 2015, Wien, AT.

*Transgender Projekt am AKH: Der Einfluss von gegengeschlechtlicher Hormontherapie auf die Struktur und Funktion des Gehirns.*  
XXI Update in Psychiatrie, Psychotherapie, und Psychopharmakotherapie, Mai 28 – 29, 2016, Wien, AT.

*The monoamine oxidase A in seasonal affective disorder.*  
12th PhD Symposium YSA Vienna, Juni 9 – 10, 2016, Wien, AT.

*Gegengeschlechtliche Hormontherapie bei Transsexuellen: Einfluss auf neuronale Korrelate der Emotionsverarbeitung.*  
Winterseminar Biologische Psychiatrie, März 22 – 26, 2014, Wien, AT.

*Einfluss der Hormontherapie auf die Gehirnaktivierung bei Transsexuellen erforscht mit 7 Tesla fMRI.*  
Winterseminar Biologische Psychiatrie, März 10 – 13, 2013, Oberlech, AT.

*The influence of cross-sex hormone therapy on stop signal task related brain activation measured with 7T fMRI.*  
13th Meeting of the Austrian Neuroscience Association (ANA), September 16 – 19, Wien, AT.

### **Kongressorganisation**

2017 – 2018            Organization “Wissenschaftsseminar” Department of Psychiatry and Psychotherapy, Medical University of Vienna

2017                    Programmkommittee Tagung der Österreichischen Gesellschaft für Neuropsychopharmacology und Biologische Psychiatrie, ÖGPB), November 9-10, 2017, Vienna, Austria.

## Publikationen

### *Erst- oder Letztautorin*

#### ***In Revision:***

Handschuh P, Murgaš M, Vranka C, Nics L, Hartmann AM, Winkler-Pjrek E, Baldinger-Melich P, Wadsak W, Winkler D, Hacker M, Rujescu D, Domschke K, Lanzenberger R, **Spies M**

*Effect of MAOA DNA methylation on human in vivo protein expression measured by [<sup>11</sup>C]harmine positron emission tomography*

**International Journal of Neuropsychopharmacology**, in Revision

Klöbl M, Reed MB, Handschuh PA, Kaufmann U, Konadu ME, Ritter V, Spurny-Dworak B, Kranz GS, Lanzenberger R, **Spies M**.

*Gender dysphoria and sexual euphoria – A Bayesian perspective on the influence of gender-affirming hormone therapy on sexual arousal*

**Archives of Sexual Behavior**, in Revision

#### ***Under Review:***

**Spies M**,\* Murgaš M\*, Vranka C, Philippe C, Gryglewski G, Nics L, Balber T, Baldinger-Melich P, Hartmann AM, Rujescu D, Hacker M, Winkler-Pjrek E, Winkler D, Lanzenberger R \*contributed equally  
*Impact of genetic variants of serotonin turnover enzymes on human cerebral monoamine oxidase A in vivo*

**Translational Psychiatry**, under Review

#### ***Published***

Kranz GS, **Spies M**\* (**\*shared first author**), Vranka C, Kaufmann U, Klebermass EM, Handschuh PA, Ozenil M, Murgaš M, Pichler V, Rischka L, Nics L, Konadu ME, Ibeschitz H, Traub-Weidinger T, Wadsak W, Hahn A, Hacker M, Lanzenberger R.

*High-dose testosterone treatment reduces monoamine oxidase A levels in the human brain: a preliminary report*

**Psychoneuroendocrinology**. 2021 Aug 6;133:105381. IF 2021: 4.693

**Spies M**, Nasser A, Ozenne B, Jensen PS, Knudsen GM, Fisher PM.

*Common HTR2A Variants and 5-HTTLPR are not associated with human in vivo serotonin 2A receptor levels.*

**Human Brain Mapping**. 2020 Nov;41(16):4518-4528. IF 2021: 5.399

Silberbauer LR, Spurny B, Handschuh P, Klöbl M, Bednarik P, Reiter B, Ritter V, Trost P, Konadu ME, Windpassinger M, Stimpfl T, Bogner W, Lanzenberger R, **Spies M**.

*Effect of ketamine on limbic GABA and glutamate. A human in vivo multivoxel magnetic resonance spectroscopy study.*

**Frontiers in Psychiatry**. 2020 Sep 8;11:549903. IF 2021: 5.435

**Spies M**, Klöbl M, Höflich A, Hummer A, Vanicek T, Michenthaler P, Kranz GS, Hahn A, Winkler D, Windischberger C, Kasper S, Lanzenberger R.

*Association between dynamic resting-state functional connectivity and ketamine plasma levels in visual processing networks.*

**Scientific Reports**. 2019 Aug 7;9(1):11484. IF 2021: 4.996

**Spies M**, James GM, Vranka C, Philippe C, Hienert M, Gryglewski G, Komorowski K, Kautzky A, Silberbauer L, Pichler V, Kranz GS, Nics L, Balber T, Baldinger-Melich P, Vanicek T, Spurny B, Winkler-Pjrek E, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Lanzenberger R, Winkler D.



*Brain monoamine oxidase A in seasonal affective disorder and treatment with bright light therapy.*  
**Translational Psychiatry.** 2018 Sep 21;8(1):198. IF 2021: 7.989

**Spies M**, James GM, Berroterán-Infante N, Ibeschitz H, Kranz GS, Unterholzner U, Godbersen M, Gryglewski G, Hienert M, Jungwirth J, Pichler C, Reiter B, Silberbauer L, Winkler D, Mitterhauser M, Stimpfl T, Hacker M, Kasper S, Lanzenberger R.

*Assessment of ketamine binding of the serotonin transporter in humans with positron emission tomography.*  
**International Journal of Neuropsychopharmacology.** 2018 Feb 1;21(2):145-153. IF 2021: 5.678

**Spies M**, Kraus C, Geissberger N, Auer B, Klöbl N, Tik M, Stürkat IL, Hahn A, Woletz M, Pfabigan DM, Kasper S, Lamm C, Windischberger C, Lanzenberger R.

*Default mode network deactivation during emotion processing predicts early antidepressant response.*  
**Translational Psychiatry.** 2017 Jan 24;7(1):e1008. IF 2021: 7.989

**Spies M**, Hahn A, Kranz GS, Sladky R, Kaufmann U, Hummer A, Ganger S, Kraus C, Winkler D, Seiger R, Comasco E, Windischberger C, Kasper S, Lanzenberger R.

*Gender transition affects neural correlates of empathy: A resting state functional connectivity study with ultra high-field 7T MR imaging.*

**Neuroimage.** 2016 Sep;138:257-265. IF 2021: 7.4

**Spies M**, Knudsen GM, Lanzenberger R, Kasper S.

*The serotonin transporter in psychiatric disorders: insights from PET imaging.*

**Lancet Psychiatry.** 2015 Aug;2(8):743-755. IF 2021: 77.056

Vanicek T\*, **Spies M\*** (\*shared first author), Rami-Mark C, Savli M, Höflich A, Kranz GS, Hahn A, Kutzelnigg A, Traub-Weidinger T, Mitterhauser M, Wadsak W, Hacker M, Volkow N, Kasper S, Lanzenberger R.

*The norepinephrine transporter in attention deficit and hyperactivity disorder investigated with (S,S)-[18F]FMeNER-D2.*

**JAMA Psychiatry.** 2014 Dec 1;71(12):1340-1349. IF 2021: 25.941

### **Koauthorin**

Spurny-Dworak B, Handschuh P, **Spies M**, Kaufmann U, Seiger R, Klöbl M, Konadu ME, Reed MB, Ritter V, Baldinger-Melich P, Bogner W, Kranz GS, Lanzenberger R.

*Effects of sex hormones on brain GABA and glutamate levels in a cis- and transgender cohort.*

**Psychoneuroendocrinology.** 2022 Apr;138:105683. IF 2021: 4.693

Godbersen GM, Murgas M, Gryglewski G, Klöbl M, Unterholzner J, Rischka L, Spies M, Baldinger-Melich P, Winkler D, Lanzenberger R.

*Coexpression of gene transcripts with monoamine oxidase A quantified by human in vivo positron emission tomography.*

**Cerebral Cortex.** 2021 Dec 25:bhab430. IF 2021: 4.861

Bednarik P, Spurny B, Silberbauer LR, Svatkova A, Handschuh PA, Reiter B, Konadu ME, Stimpfl T, **Spies M**, Bogner W, Lanzenberger R.

*Effects of Ketamine on Human Neurochemistry in Posterior Cingulate Cortex: A Pilot Magnetic Resonance Spectroscopy Study at 3 Tesla.*

**Frontiers in Neuroscience.** 2021 Mar 24;15:609485. IF 2021: 5.152

Mori A, Klöbl M, Okada G, Reed MB, Takamura M, Michenthaler P, Takagaki K, Handschuh PA, Yokoyama S, Murgas M, Ichikawa N, Gryglewski G, Shibasaki C, **Spies M**, Yoshino A, Hahn A, Okamoto Y, Lanzenberger R, Yamawaki S, Kasper S.

*Predicting ventral striatal activation during reward anticipation from functional connectivity at rest.*  
**Frontiers in Human Neuroscience.** 2019 Aug 27;13:289. IF 2021: 3.473

Bartova L, Dold M, Kautzky A, Fabbri C, **Spies M**, Serretti A, Souery D, Mendlewicz J, Zohar J, Montgomery S, Schosser A, Kasper S.  
*Results of the European group for the study of resistant depression (GSRD) – basis for further research and clinical practice.*  
**World Journal of Biological Psychiatry.** 2019 Jul;20(6):427-448. IF 2021: 3.418,

Spurny B, Heckova W, Seiger R, Moser P, Klöbl M, Vanicek T, **Spies M**, Bogner W, Lanzenberger R.  
*Automated ROI-based labeling for multi-voxel magnetic resonance spectroscopy data using FreeSurfer.*  
**Frontiers in Molecular Neuroscience.** 2019 Feb 14;12:28. IF 2021: 6.261

James GM, Gryglewski G, Vanicek T, Berroterán-Infante N, Philippe C, Kautzky A, Nies L, Vracka C, Godbersen GM, Unterholzner J, Sigurdardottir HL, **Spies M**, Seiger R, Kranz GS, Hahn A, Mitterhauser M, Wadsak W, Bauer A, Hacker M, Kasper S, Lanzenberger R.  
*Parcellation of the human cerebral cortex based on molecular targets in the serotonin system quantified by positron emission tomography in vivo.*  
**Cerebral Cortex.** 2019 Jan 1;29(1):372-382. IF 2021: 4.861

Kautzky A, Dold M, Bartova L, **Spies M**, Kranz GS, Souery D, Montgomery S, Mendlewicz J, Zohar J, Fabbri C, Serretti A, Lanzenberger R, Dikeos D, Rujescu D, Kasper S.  
*Clinical factors predicting treatment resistant depression: affirmative results from the European multicenter study.*  
**Acta Psychiatrica Scandinavia.** 2019 Jan;139(1):78-88. IF 2021: 7.734

Winkler D, **Spies M**, Al-Resheg Y, Wu JC, Bunney WE, Bunney BG, Kasper S, Pjrek E.  
*Usage of therapeutic sleep deprivation: A survey in psychiatric hospitals in Austria, Germany and Switzerland.*  
**Behavioral Sleep Medicine.** 2018 May 18:1-8. IF 2021: 3.492

Kranz GS, Hahn A, Kraus C, **Spies M**, Pichler V, Jungwirth J, Mitterhauser M, Wadsak W, Windischberger C, Kasper S, Lanzenberger R.  
*Probing the association between serotonin-1A autoreceptor binding and amygdala reactivity in healthy volunteers.*  
**Neuroimage.** 2018 May 1;171:1-5. 2018. IF 2021: 7.4

Kautzky A, Dold M, Bartova L, **Spies M**, Vanicek T, Souery D, Montgomery S, Mendlewicz J, Zohar J, Fabbri C, Serretti A, Lanzenberger R, Kasper S.  
*Refining prediction in treatment-resistant depression; results of machine learning analyses in the TRD III sample.*  
**Journal of Clinical Psychiatry.** 2018 Jan/Feb;79(1). IF 2021: 5.906

Nussbaumer-Streit B, Winkler D, **Spies M**, Kasper S, Pjrek E.  
*Prevention of seasonal affective disorder in daily clinical practice: results of a survey in German-speaking countries.*  
**BMC Psychiatry.** 2017 Jul 11;17(1):247. IF 2021: 4.144

Höflich A, Hahn A, Küblböck M, Kranz GS, Vanicek T, Ganger S, **Spies M**, Windischberger C, Kasper S, Winkler D, Lanzenberger R.  
*Ketamin-dependent neuronal activation in healthy volunteers.*  
**Brain Structure and Function.** 2017 Apr;222(3):1533-1542. IF 2021: 3.748

Kraus C, Rabl U, Vanicek T, Carlberg L, Popovic A, **Spies M**, Bartova L, Gryglewski G, Papageorgiou K, Lanzenberger R, Willeit M, Winkler D, Rybakowski JK, Kasper S.  
*Administration of ketamine for unipolar and bipolar depression.*

**International Journal of Psychiatry in Clinical Practice.** 2017 Mar;21(1):2-12. – 1.337. IF 2021: 2.750

Höflich A, Ganger S, Tik M, Hahn A, Kranz GS, Vanicek T, **Spies M**, Kraus C, Windischberger C, Kasper S, Winkler D, Lanzenberger R.

*Imaging the neuroplastic effects of ketamine with VBM and the necessity of placebo control.*  
**Neuroimage.** 2017 Feb 15;147:198-203. IF 2021: 7.4

James GM, Baldinger-Melich P, Philippe C, Kranz G, Vanicek T, Hahn A, Grygloewski G, Hienert M, **Spies M**, Traub-Weidinger T, Mitterhauser M, Wadsak W, Hacker M, Kasper S, Lanzenberger R.

*Effects of selective serotonin reuptake inhibitors on interregional relation of serotonin transporter availability in major depression.*

**Frontiers in Human Neuroscience.** 2017 Feb 6;11:48. IF 2021: 3.473

Baumann P, **Spies M**, Möller HJ, Kasper S, Bitter I, Laux G.

*A proposal for a psychopharmacology-pharmacotherapy catalogue of learning objectives and a curriculum in Europe.*

**World Journal of Biological Psychiatry.** 2017 Feb;18(1):29-38. IF 2021: 3.418

Komorowski A, James GM, Philippe C, Gryglewski G, Bauer A, Hienert M, **Spies M**, Kautzky A, Vanicek T, Hahn A, Traub-Weidinger T, Winkler D, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Lanzenberger R.

*Association of protein distribution and gene expression revealed by PET and post-mortem quantification in the serotonergic system of the human brain.*

**Cerebral Cortex.** 2017 Jan 1;27(1):117-130. IF 2021: 4.861

Winkler D, Pjrek E, **Spies M**, Willeit M, Dorffner G, Lanzenberger R, Kasper S.

*Has the existence of seasonal affective disorder been disproven?*

**Journal of Affective Disorders.** 2017 Jan 15;208:54-55. IF 2021: 6.533

Winkler-Pjrek E, **Spies M**, Baldinger-Melich P, Perkmann L, Kasper S, Winkler E.

*Use of light therapy by office-based physicians.*

**Neuropsychobiology.** 2016;74(4):182-187. IF 2021: 12.329

Kranz GS, Wolfgang W, Kaufmann U, Savli M, Baldinger P, Gryglewski G, Häusler D, **Spies M**, Mitterhauser M, Kasper S, Lanzenberger R.

*High-dose testosterone treatment increases serotonin transporter binding in transgender people.*

**Biological Psychiatry.** 2015 Oct 15;78(8):525-33. IF 2021:12.810

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## **Teilnahme an Konferenzen**

### ***Erst- oder Letztautorin***

Handschuh PA, Murgas M, Vranka C, Nics GS, Hartmann AM, Pichler V, Pjrek-Winkler E, Baldinger-Melich P, Wadsak W, Winkler D, Rujescu D, Hacker M, Domschke K, Lanzenberger R, **Spies M**.

*Effect of MAOA exon 1 methylation on cerebral MAO-A in seasonal depression and health.*

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Klöbl M, Reed MB, Handschuh P, Kaufmann U, Konadu ME, Ritter V, Spurny-Dworak B, Kranz GS, Lanzenberger R, **Spies M**.

*A Bayesian perspective on the influence of gender-affirming hormone therapy on behavioural and neuronal correlates of sexual arousal.*

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Vanicek T\*, **Spies M\*** (shared first author), Rami-Mark C, Savli M, Kranz GS, Kutzelnigg A, Mitterhauser M, Wadsak W, Volkow N, Kasper S, Lanzenberger R.

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Konadu ME, Reed MB, Kaufmann U, Handschuh P, **Spies M**, Spurny-Dworak B, Klöbl M, Ritter V, Godbersen GM, Seiger R, Baldinger-Melich P, Kranz GS, Lanzenberger R.

*The influence of gender-affirming hormone treatment on hypothalamic volumes and subunits in gender dysphoria.*

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*Investigating seasonal influences on brain GABA and glutamate levels.*

Annual Meeting of the Organization for Human Brain Mapping (OHBM), June 19-23 2022, Glasgow, Scotland.

Spurny B, Kranz GS, **Spies M**, Kaufmann U, Seiger R, Klöbl M, Handschuh P, Konadu M, Reed MB, Ritter V, Baldinger-Melich P, Bogner W, Lanzenberger R.

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Spurny B, Kranz GS, **Spies M**, Kaufmann U, Seiger R, Klöbl M, Handschuh P, Konadu M, Reed MB, Ritter V, Baldinger-Melich P, Bogner W, Lanzenberger R.

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*Investigating changes to glutamate and GABA in gender dysphoria.*

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Kraus C, Seiger R, Pfabigan DM, Sladky R, Auer B, Tik M, Paul K, Woletz M, **Spies M**, Gryglewski G, Vanicek T, Komorowski A, Kasper S, Lamm C, Windischberger C, Lanzenberger R.

*Antidepressant treatment outcome assessment with 7T MRI.*

SOBP Annual Meeting, May 16-18, 2019, Chicago, USA.

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*Prediction of Antidepressant Treatment Outcomes with Ultra-high Field Magnetic Resonance Imaging.*

ASCP 2019, American Society of Clinical Psychopharmacology, May 28-31, 2019, Scottsdale (Phoenix), Arizona, USA.

James GM, Gryglewski G, Vanicek T, Berroteran-Infante N, Philippe C, Kautzy A, Nics L, Vranka C, Godbersen GM, Unterholzner J, Sigurdardottir LH, **Spies M**, Seiger R, Kranz GS, Hahn A, Mitterhauser M, Wadsak W, Bauer A, Hacker M, Kasper S, Lanzenberger R.

*Parcellation of the cortical serotonergic neurotransmitter system using positron emission tomography and FreeSurfer.*

31<sup>st</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 6 – 9, 2018, Barcelona, Spain.

Kautzky A, Dold M, Bartova L, **Spies M**, Kranz GS, Souery D, Montgomery S, Mendlewicz J, Zohar J, Fabbri C, Serretti A, Lanzenberger R, Dikeos D, Rujescu D, Kasper S.

*Clinical predictors of treatment resistant depression: replication results from the European multicenter study.*

31<sup>st</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 6 – 9, 2018, Barcelona, Spain.

Baldinger-Melich P, Urquijo MF, Seiger R, Kranz GS, **Spies M**, Kaufmann U, Windischberger C, Kasper S, Falkai P, Koutsouleris N, Lanzenberger R.

*The neuroanatomical pattern of sex and gender in cis- and transgender individuals revealed by machine learning-based pattern recognition with NeuroMiner.*

31<sup>st</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 6 – 9, 2018, Barcelona, Spain.

Sigurdardottir HL, Kranz GS, Vanicek T, James GM, Gryglewski G, **Spies M**, Mitterhauser M, Wadsak W, Rujescu D, Kasper S, Lanzenberger R.

*Effects of methylation on norepinephrine transporter expression measured by PET in ADHD.*

31<sup>st</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 6 – 9, 2018, Barcelona, Spain.

Spurny B, Moser P, Seiger R, Heckova E, Klöbl M, Vanicek T, **Spies M**, Bogner W, Lanzenberger R.

*Introducing automated ROI-based analysis for 3D-multivoxel magnetic resonance spectroscopy.*

24<sup>th</sup> Annual Meeting of the Organization for Human Brain Mapping, June 17 – 21, 2018, Singapore, Republic of Singapore.



Kranz GS, Hahn A, Kraus C, **Spies M**, Pichler V, Mitterhauser M, Wadsak W, Windischberger C, Kasper S, Lanzenberger R.

*Investigating presynaptic serotonergic regulation of amygdala reactivity using PET and fMRI.*

24<sup>th</sup> Annual Meeting of the Organization for Human Brain Mapping, June 17 – 21, 2018, Singapore, Republic of Singapore.

James GM, Seiger R, **Spies M**, Vranka C, Philippe C, Hienert M, Gryglewski G, Komorowski A, Kautzky A, Silberbauer L, Pichler V, Kranz GS, Nics L, Balber T, Baldinger-Melich P, Vanicek T, Winkler-Pjrek E, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Lanzenberger R, Winkler D.

*Cortical monoamine oxidase A distribution in seasonal affective disorder compared to healthy controls.*

30<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, September 2 – 5, 2017, Paris, France.

Silberbauer L, Gryglewski G, **Spies M**, James GM, Vranka C, Philippe C, Hienert M, Komorowski A, Kautzky A, Kranz GS, Nics L, Baldinger P, Pjrek-Winkler E, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Winkler D, Lanzenberger R.

*Monoamine oxidase A quantification in the living human brain using positron emission tomography and [<sup>11</sup>C]harmine.*

13<sup>th</sup> YSA PhD Symposium, June 8 – 9, 2017, Medical University of Vienna, Vienna, Austria.

James GM, Gryglewski G, Vranka C, Seiger R, Pichler V, Silberbauer L, Nics L, Spurny B, **Spies M**, Mitterhauser M, Hahn A, Wadsak W, Hacker M, Kasper S, Lanzenberger R.

*Cortical segmentation of the human brain using distributions of serotonergic key proteins quantified by PET in vivo.*

13<sup>th</sup> YSA PhD Symposium, June 8 – 9, 2017, Medical University of Vienna, Vienna, Austria.

Kautzky A, Sigurdardottir HL, Rami-Mark C, James GM, Vanicek T, Kranz GS, Gryglewski G, **Spies M**, Traub-Weidinger T, Mitterhauser M, Wadsak W, Hacker M, Papageorgiou K, Kasper S, Lanzenberger R.

*Prediction of ADHD with PET imaging and genetic data in a machine learning model.*

6<sup>th</sup> World Congress on ADHD, April 20 – 23, 2017, Vancouver, Canada.

Vanicek T, Sigurdardottir HL, Rami-Mark C, James GM, Kautzky A, Kranz GS, Gryglewski G, **Spies M**, Traub-Weidinger T, Mitterhauser M, Wadsak W, Hacker M, Papageorgiou K, Kasper S, Lanzenberger R.

*Imaging genetics using PET: Effects of single nucleotide polymorphisms on NET binding in patients with ADHD and healthy controls.*

6<sup>th</sup> World Congress on ADHD, April 20 – 23, 2017, Vancouver, Canada.

Seiger R, James GM, **Spies M**, Vranka C, Nics L, Hienert M, Philippe C, Baldinger P, Wadsak W, Mitterhauser M, Kasper S, Winkler D, Lanzenberger R.

*Association between cortical thickness and MAO-A binding in subjects suffering from seasonal affective disorder.*

BRAIN PET 2017 (28<sup>th</sup> Symposium on cerebral blood flow, metabolism and function; 13<sup>th</sup> conference on quantification of brain function with PET), April 1 – 4, 2017, Berlin, Germany.

James GM, Gryglewski G, Vranka C, Seiger R, Pichler V, Silberbauer L, Nics L, Spurny B, **Spies M**, Mitterhauser M, Hahn A, Wadsak W, Hacker M, Kasper S, Lanzenberger R.

*Clustering serotonergic key players of the human cortex using positron emission tomography and FreeSurfer.*

BRAIN PET 2017 (28<sup>th</sup> Symposium on cerebral blood flow, metabolism and function; 13<sup>th</sup> conference on quantification of brain function with PET), April 1 – 4, 2017, Berlin, Germany.

Seiger R, Hahn A, Sladky R, Kranz GS, Ganger S, Hummer A, **Spies M**, Windischberger C, Kasper S, Lanzenberger R.

*Hormonal-induced resting-state functional connectivity alterations in transgender people measured with ultra-high field 7T MRI.*

5<sup>th</sup> Biennial Conference on Resting State and Brain Connectivity, September 21 – 23, 2016, Vienna, Austria.

Hienert M, **Spies M**, Vranka C, James GM, Hahn A, Nics L, Philippe C, Gryglewski G, Baldinger P, Kautzky A, Komorowski A, Vanicek A, Winkler-Pjrek E, Traub-Weidinger T, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Winkler D, Lanzenberger R.

*Light exposure and seasonal variation of the serotonin degrading enzyme monoamine oxidase A in the healthy human brain revealed by PET.*

30<sup>th</sup> International College of Neuropsychopharmacology (CINP) World Congress, July 3 – 5, 2016, Seoul, Republik of Korea.

Kautzky A, Dold M, Gryglewski G, Baldinger P, **Spies M**, Vanicek T, Souery D, Montgomery S, Mendlewicz J, Zohar J, Serretti A, Lanzenberger R, Kasper S.

*An update on prediction in treatment outcome in treatment resistant depression.*

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Seiger R, Hahn A, Spurny B, Mitterhauser M, Baldinger-Melich P, **Spies M**, Wadsak W, Hacker M, Kasper S, Lanzenberger R.

*Surface-based PET analysis of the 5-HT<sub>1A</sub> serotonin receptor and quantitative assessment of smoothing.*

Annual Meeting of the Organization for Human Brain Mapping (OHBM), June 26 – 30, 2016, Geneva, Switzerland.

James GM, Kranz GS, Hahn A, Gryglewski G, Hienert M, **Spies M**, Wadsak W, Mitterhauser M, Kasper S, Lanzenberger R.

*Interregional changes in serotonin transporter availability upon treatment with selective serotonin reuptake inhibitors.*

28<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, 29 August – 1 September, 2015, Amsterdam, Netherlands.

Hahn A, Kranz GS, Sladky R, Kaufmann U, Ganger S, Hummer A, Seiger R, **Spies M**, Vanicek T, Winkler D, Kasper S, Windischberger C, Swaab DF, Lanzenberger R.

*Neuronal plasticity of language-related brain regions induced by long-term testosterone treatment.*

28<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, 29 August – 1 September, 2015, Amsterdam, Netherlands.

Gryglewski G, Hienert M, Sigurdardottir HL, Komorowski A, Vanicek T, **Spies M**, Mitterhauser M, Wadsak W, Kasper S, Lanzenberger R.

*Interpolation of sparse mRNA samples to create comprehensive atlases of neuronal protein transcription.*

28<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, 29 August – 1 September, 2015, Amsterdam, Netherlands.

Baldinger P, James GM, **Spies M**, Kranz GS, Hienert M, Kautzky A, Gryglewski G, Kasper S, Lanzenberger R, Winkler D.

*Cerebral monoamine oxidase A distribution volume in seasonal affective disorder.*

28<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, 29 August – 1 September, 2015, Amsterdam, Netherlands.

Kautzky A, Papageorgiou K, Sigurdardottir HL, Hahn A, Kranz GS, **Spies M**, Vanicek T, Rami-Mark C, Traub-Weidinger T, Hacker M, Mitterhauser M, Wadsak W, Kasper S, Lanzenberger R.

*Norepinephrine transporter binding and personality traits in patients with attention deficit/hyperactivity disorder investigated with PET and (S,S)-[<sup>18</sup>F]FMeNER-D<sub>2</sub>.*

5<sup>th</sup> World Congress on ADHD, May 28 – 31, 2015, Glasgow, Scotland.

Vanicek T, Kutzelnigg A, Sigurdardottir HL, Hahn A, Kranz GS, **Spies M**, Kautzky A, Haeusler D, Traub-Weidinger T, Hacker M, Wadsak W, Kasper S, Mitterhauser M, Lanzenberger R.

*Altered serotonin transporter binding in patients with attention deficit/hyperactivity disorder investigated with PET and [<sup>11</sup>C]DASB.*

5<sup>th</sup> World Congress on ADHD, 28 – 31 May, 2015, Glasgow, Scotland.

Hahn A, Winkler D, Vranka C, Nics L, Philippe C, James GM, Gryglewski G, Hienert M, Baldinger P, Kautzky A, **Spies M**, Komorowski A, Vanicek T, Winkler-Pjrek E, Traub-Weidinger T, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Lanzenberger R.

*Seasonal variation of monoamine oxidase-A quantified with [<sup>11</sup>C]harmine and population-based input functions.*

12th International Conference on Quantification of Brain Function with PET, June 27th – 30th, 2015, Vancouver, Canada.

Sladky R, Kraus C, Stürkat IL, Hoffmann A, Lamplmair D, Tik M, **Spies M**, Pfabigan D, Lamm C, Lanzenberger R, Windischberger C.

*Effective connectivity of amygdalar sub regions and OFC in acute and remitted MDD patients at 7T.*

21st Annual Meeting of the Organization for Human Brain Mapping (HBM), June 14 – 18, 2015, Honolulu, Hawaii, USA.

Hoffmann A, Sladky R, **Spies M**, Pfabigan D, Küblböck M, Höflich A, Seidel E, Hummer A, Lamm C, Lanzenberger R, Windischberger C.

*Detection sensitivity of the default mode network at 3T and 7T.*

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*Continuous testosterone administration affects language-specific brain structures and function.*

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*Gray matter volume changes after long-term testosterone administration in transgender people.*

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*Attenuated serotonin transporter binding with increased age in patients with attention deficit/hyperactivity disorder.*

12<sup>th</sup> World Congress of Biological Psychiatry (WFSBP), June 14 – 18, 2015, Athens, Greece.

Hoffmann A, Sladky R, **Spies M**, Pfabigan D, Küblböck M, Höflich A, Paul K, Hummer A, Kranz GS, Lamm C, Lanzenberger R, Windischberger C.

*Frequency-dependency of the default-mode network.*

4<sup>th</sup> Biennial Conference on Resting State / Brain Connectivity, September 11 – 13, 2014, Boston/Cambridge, USA.

Savli M, Baldinger P, Haeusler D, Kranz GS, Philippe C, **Spies M**, Wadsak W, Mitterhauser M, Kasper S, Lanzenberger R.

*Alterations of molecular connectivity in major depression before and during treatment with selective serotonin reuptake inhibitors.*

27<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 18 – 21, 2014, Berlin, Germany.

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*Modulatory effects of cross-sex steroid hormones in the adult human brain: a voxel-based morphometry study.*

27<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 18 – 21, 2014, Berlin, Germany.

Baldinger P, Hahn A, Rami-Mark C, **Spies M**, Wadsak W, Höflich A, Mitterhauser M, Lanzenberger R, Kasper S.

*Neural correlates of the anxiolytic effects of Silexan.*

27<sup>th</sup> European College of Neuropsychopharmacology (ECNP) Congress, October 18 – 21, 2014, Berlin, Germany.

Kranz GS, Wadsak W, Kaufmann U, Savli M, Baldinger P, Gryglewski G, Haeusler D, **Spies M**, Mitterhauser M, Kasper S, Lanzenberger R.

*Testosterone increases serotonin transporter binding in a transgender treatment model investigated by positron emission tomography.*

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Vanicek T, **Spies M**, Rami-Mark C, Savli M, Höflich A, Kranz GS, Hahn A, Mitterhauser M, Wadsak W, Hacker M, Kasper S, Lanzenberger R.

*The norepinephrine transporter in adult attention deficit hyperactivity disorder quantified by PET in vivo.* Annual Meeting of the Organization for Human Brain Mapping (OHBM), June 8 – 12, 2014, Hamburg, Germany.

Sladky R, **Spies M**, Hoffmann A, Kranz GS, Hummer A, Gryglewski G, Lanzenberger R, Windischberger C, Kasper S.

*(S)-citalopram influences amygdalar modulation in healthy subjects demonstrated by DCM for fMRI.*

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Kranz GS, Kaufmann U, Haeusler D, Savli M, Baldinger P, **Spies M**, Gryglewski G, Wadsak W, Mitterhauser M, Kasper S, Lanzenberger R.

*Effects of cross-sex hormone treatment on serotonin transporter binding investigated using PET and [<sup>11</sup>C]DASB.*

The 10<sup>th</sup> International Symposium on Functional NeuroReceptor Mapping of the Living Brain (NRM), May 21 – 24, 2014, The Netherlands.

Hahn A, Baldinger P, Nics L, Höflich A, Philippe C, **Spies M**, Vraka C, Haeusler D, Vanicek T, Wadsak W, Mitterhauser M, Hacker M, Kasper S, Lanzenberger R.

*Population-based input functions for serotonin transporter quantification with [<sup>11</sup>C]DASB.*

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Kranz GS, Lanzenberger R, Haeusler D, Baldinger P, Savli M, **Spies M**, Gryglewski G, Wadsak W, Mitterhauser M, Kasper S.

*SSRI-induced occupancy of the serotonin transporter investigated with positron emission tomography.*

Joint Meeting of the Austrian Neuroscience Association (ANA) and the Austrian Pharmacological Society (APHAR), September 16 – 19, 2013, Vienna, Austria.

Kraus C, Ganger S, Losak J, Hahn A, Savli M, **Spies M**, Baldinger P, Windischberger C, Kasper S, Lanzenberger R.

*Rapid gray matter increases and resting state network changes after selective serotonin reuptake inhibitor administration*

11<sup>th</sup> World Congress of Biological Psychiatry (WFSBP), June 23 – 27, 2013, Kyoto, Japan.

Ganger S, Hahn A, Sladky R, Küblböck M, Kranz GS, Höflich A, Kraus C, Losak J, **Spies M**, Windischberger C, Lanzenberger R.

*Comparing techniques for resting state extraction from task data.*

19<sup>th</sup> Annual Meeting of the Organization for Human Brain Mapping (OHBM), June 16 – 20, 2013, Seattle, WA, USA.

Kranz GS, Lanzenberger R, Haeusler D, Baldinger P, Savli M, **Spies M**, Wadsak W, Mitterhauser W, Kasper S.

*Regional serotonin transporter occupancy by SSRIs investigated using positron emission tomography.*

19<sup>th</sup> Annual Meeting of the Organization for Human Brain Mapping (OHBM), June 16 – 20, 2013, Seattle, WA, USA.

Kranz GS, Hahn A, Haeusler D, Philippe C, Kaufmann U, Wadsak W, **Spies M**, Mitterhauser M, Kasper S, Lanzenberger R.

*Serotonin transporter asymmetry in females and males investigated by PET.*

XI<sup>th</sup> International Conference on Quantification of Brain Function with PET, May 20 – 23, 2013, Shanghai, China.

Lanzenberger R, Kranz GS, Baldinger P, Savli M, Haeusler D, **Spies M**, Hahn A, Wadsak W, Mitterhauser M, Kasper S.

*Regional occupancy differences of the serotonin transporter investigated by brain PET.*

XI<sup>th</sup> International Conference on Quantification of Brain Function with PET, May 20 – 23, 2013, Shanghai, China.