

MARLOES J.A.G. HENCKENS

PROFESSIONAL PROFILE

My research aims to understand how stress exposure can lastingly affect the brain. Using animal models that allow for controlled study of the mechanistic underpinnings of stress-related psychopathology as well as tests for causal relationships, I intend to elucidate how stress influences brain functioning. Since the brain is organized as set of functional neural networks, I focus on the neural circuit level (by means of neuronal activation markers, rodent MRI, viral tracing) and combine this with molecular studies to provide detailed mechanistic insight (investigating epigenetic mechanisms and local gene expression). I am particularly interested in inter-individual differences in the neural correlates of stress responsivity and subsequent coping, as I think that the natural resiliency against developing stress-related mental disorders contains unique information for new treatment options.



PROFESSIONAL EXPERIENCE

Radboudumc Nijmegen

Dep. Cognitive Neuroscience
Since 01/2018

● **Junior Principal Investigator**

Junior group leader investigating the neurobiology of stress and its long-term consequences, focussing on the inter-individual differences in stress sensitivity

Radboudumc Nijmegen

Dep. Cognitive Neuroscience
01/2015-12/2017

● **Postdoctoral Fellow**

Project: Neural networks of Post Traumatic Stress Disorder; natural resilience as key for new treatment options

Techniques: Rodent MRI, transgenic mouse models, behavioural testing
Principal Investigator: Dr. Judith Homberg

Weizmann Institute of Science

Dep. Neurobiology of Stress
Rehovot, Israel
01/2013-12/2014

● **Postdoctoral Fellow**

Project: The role of CRFR2 in the bed nucleus of stria terminalis in modulating stress and anxiety

Techniques: Viral manipulation, transgenic mouse models, optogenetics, behavioural testing, clarity
Principal Investigator: Prof. dr. Alon Chen

UMC Utrecht

Dep. Neuroscience and Pharmacology
08/2010-09/2012

● **PhD (cum laude)**

Project: Imaging the stressed brain. Elucidating the time- and region-specific effects of stress hormones on brain function; a translational approach

Techniques: Human functional MRI (task-related and resting state), behavioural testing, pharmacology, electrophysiology (patch-clamp), rodent MRI

Promoters: Prof. dr. Guillén Fernández, Prof. dr. Marian Joëls

Co-promotor: Dr. Guido van Wingen

Radboud University Nijmegen

Dep. Emotion and Memory
08/2008-07/2010



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EDUCATION

Radboud University Nijmegen
09/2006-07/2008

● **MSc Natural Sciences (cum laude)**

- Study trip to China, including a casestudy 'Corporate Social Responsibility in China' assigned by Diosynth, Organon

Radboud University Nijmegen
09/2002-08/2006

● **BSc Natural Sciences (bene meritum)**

- Honours student
 - Member board study association Leonardo da Vinci (Natural Sciences)
 - Member board study association Olympus (all natural and life sciences)
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TEACHING AND SUPERVISION

Co-promotor

- Pieter Schipper (Cognitive Neuroscience, Radboudumc Nijmegen) (thesis defense: 10/10/2017)
- Graeme Preston (School of Medicine of Tulane University, New Orleans, USA) (thesis defense: 22/02/2019)
- Bart Dirven (Anatomy, Radboudumc Nijmegen)
- Qi Song (Cognitive Neuroscience, Radboudumc Nijmegen)
- Chunan Guo (Cognitive Neuroscience, Radboudumc Nijmegen)
- Floriana Mogavero (Cognitive Neuroscience, Radboudumc Nijmegen)
- Maxime Houtekamer (Cognitive Neuroscience, Radboudumc Nijmegen)
- Sevgi Bahtiyar (Recipient Donders' Toptalent grant, Cognitive Neuroscience, Radboudumc Nijmegen)
- Dewi van der Geugten (Recipient Donders' Toptalent grant, Cognitive Neuroscience, Radboudumc Nijmegen)
- Kari Bosch (Cognitive Neuroscience, Radboudumc Nijmegen)

Supervisor

- Kubra Gulmez Karaca (postdoctoral fellow, Cognitive Neuroscience, Radboudumc Nijmegen)
- Archana Ashokan (postdoctoral fellow, Cognitive Neuroscience, Radboudumc Nijmegen)
- Daily supervisor of MSc and BSc students in their research internships and thesis writing (n = 18)

Lecturer in Academic Courses

- Neurobiology of stress module, Biomedical MSc students at the Radboudumc Nijmegen
- Animal models for psychiatric and neurological disorders module, Biomedical MSc students at the Radboudumc Nijmegen
- Stress-related psychopathology module, Biomedical and medical MSc students at the Radboudumc Nijmegen
- Neurobiology of stress (mal)adaptation module, Cognitive Neuroscience MSc students at the Radboud University Nijmegen
- Advanced psychopathology module, Neuroscience MSc students at the University of Amsterdam
- Translational Neuroscience module, Neuroscience MSc students at the ErasmusMC, Rotterdam
- Introduction to Cognitive Neuroscience Summer School, Radboud University Nijmegen

Tutor / Mentor

- Mentor (confidante) for 6 PhD students at the Donders Institute, Nijmegen
- Supervisor practical Translational Neuroscience, MSc students at the Radboud University and Radboudumc
- Tutor in the course Stress-related psychopathology as part of the Neuroscience minor for Biomedical MSc students at the Radboudumc Nijmegen
- Tutor at the Cognitive Science Center Amsterdam (CSCA) Summer School Emotional Memory: from patient to synapse, University of Amsterdam (2012)

ACADEMIC ACTIVITIES

Training

- SINCE 2017 ● Participant Radboud Galilei Talent Track, an initiative of the Radboudumc aimed at excellent postdocs who are creating their own unique niche in research, education and healthcare. It supports talents and helps them to stay on track by balancing professional and personal development.
- 2017 ● 'Supervising scientific internships', Radboudumc Health Academy
- 2017 ● 'Molecules, Mice and Math: A Statistical Toolbox for the Lab' Radboud University Summer School

Responsibilities

- SINCE 2017 ● Responsible employee ('Verantwoordelijk Medewerker') for supervising all activities involving genetically modified organisms (GMOs) within the translational neuroscience unit of the Donders Institute
- Responsible PI for the operational affairs in the wet labs of the Cognitive Neuroscience department

Committee Membership

- 2020 ● Secretary of the Dutch Neurofederation
- 2016-20 ● Programme Committee of the Dutch Neuroscience Meeting
- 2015-17 ● Donders Sessions Committee; organizing the monthly 'Donders Sessions' of the Donders Institute
- 2016-17 ● PI Nomination Advisory Committee for a PI Experimental NeuroImaging at the Radboudumc
- 2010 ● Student member PI Nomination Advisory Committee for a new junior PI at the Donders Institute
- 2009-10 ● Member Donders Discussions Committee, organizing the annual conference for PhD students at the Donders Institute

Organizer

- 2019 ● Organizer of the symposium 'Modulation of memory accuracy and generalization by stress' at the European Brain and Behavior Society (EBBS) Meeting, Prague, CZ
- 2018 ● Organizer of the symposium 'Stress modulation of memory accuracy vs. generalization' at the Dutch Neuroscience Meeting, Lunteren
- 2017 ● Organizer of a masterclass hosting Prof. Alcino Silva, UCLA Brain Research Institute, at the Donders Institute Nijmegen
- 2016 ● Organizer of the symposium 'Stress-related mental disorders: is the marriage between basic research and clinical application a happy one?' at the Dutch Neuroscience Meeting, Lunteren
- 2016 ● Organizer of the interactive 'Translational Neuroscience Discussion Session' session at the Dutch Neuroscience Meeting Lunteren
- 2015 ● Organizer of masterclass 'The stressed social brain' hosting Prof. Carmen Sandi, EPFL Lausanne, at the Radboudumc Nijmegen
- 2014 ● Organizer and chair of a symposium entitled 'The stressed social brain' at the FENS Forum for Neuroscience, Milan, IT
- 2012 ● Organizer and chair of the session 'Stress-induced alterations in brain activity/connectivity: a translational approach' at the Endo-Neuro-Psycho-meeting, Lunteren

PUBLIC OUTREACH & SOCIETAL INVOLVEMENT

Public Lectures / Events

- 2019 ● Jury member for the Dutch Brain Bee competition (Hersenolympiade), competition for high school students on neuroscience-related knowledge, Nijmegen
- 2018-17 ● Lecturer in 5 high school classes at the Stedelijk Gymnasium Nijmegen and Arnhem for the Brain Awareness Week
- 2017 ● Lecturer and discussant at the Science Café Eindhoven in a session on stress, organized by Studium Generale Technical University Eindhoven
- 2017 ● Co-organizer of 'Lowlands got Talent', running a stress experiment into stage fright at the Lowlands Science Park with visitors of the Lowlands Music Festival, Biddinghuizen
- 2017 ● Discussant in the KennisCafé session on "Vette Stress", organized by De Volkskrant, KNAW, NEMO Science Museum and De Balie, Amsterdam
- 2016 ● Pecha kucha presentation at the Health Valley Event 2016, Nijmegen
- 2016 ● Invited participant in 'Meet the expert' at InScience, a Dutch International Film festival for scientific movies, organized by the LUX and Radboud University/Radboudumc
- 2016 ● Invited lecturer and discussant at 5 broadcasts (twice for primary schools, once for the general public) of the Disney movie 'Inside Out' at InScience, a Dutch International Film festival for scientific movies, organized by the LUX and Radboud University/Radboudumc
- 2015 ● Invited discussant at the "Nacht van de herinnering", a public lecture organized by the Soeterbeeck programme (11/06/2015)
- 2010 ● Public lecture on "The stressed brain" at the Public Day 'Brain and Stress' of the Dutch Brain Foundation (Hersenstichting), Beatrix Theatre Utrecht

Press Coverage

- 2019 ● Coverage of scientific publication in PNAS in the magazine De Psycholoog (12/2019)
- 2019 ● Personal interview on scientific publication in PNAS at BNR news radio (28/11/2019)
- 2018 ● Commentary in the magazine Sprank on the effects of chronic stress exposure on brain function (09/2018)
- 2017 ● Commentary in the Volkskrant on the inappropriate use of neuroimaging data in the popular press (13/05/2017)
- 2015 ● Personal TV interview on PhD research in television show "Wetenschap redt de wereld" of CANVAS (Episode; 'Stop de stress' on 07/12/2015)
- 2013 ● Personal interview on Veni research in 'Hypothese' (2015:3), the public magazine of NWO

LECTURES AT (INTER)NATIONAL CONFERENCES

- 2019 ● Invited lecturer at the University Leuven, Belgium
- 2019 ● Invited speaker at the Mediterranean Society for Neuroscience (MSN) Meeting, Marrakesh, Morocco
- 2019 ● Invited keynote speaker at the Mind the Brain symposium, Utrecht
- 2019 ● Speaker at the European Brain and Behavior Society (EBBS) Meeting, Prague, Czech Republic
- 2018 ● Invited lecturer at University of Bordeaux, France
- 2018 ● Invited speaker at the Sociedade Brasileira de Neurociencias e Comportamento (SBNeC) Meeting, Santos, Brasil

2019	●	Invited speaker at the Dutch Neuroscience Meeting, Lunteren
2018	●	Invited speaker at the spring conference of the Dutch Society for Psychiatry (NVvP), MECC Maastricht
2018	●	Invited speaker at the international 'Brain SIN-posium: Stress, Inflammation & Nutrition Crosstalk', Amsterdam
2017	●	Invited speaker at the British Neuroscience Association (BNA) Meeting Festival of Neuroscience, Birmingham, UK
2015	●	Invited speaker at the Valkhof Lecture, Radboudumc, Nijmegen

HONOURS & AWARDS

Radboudumc 2019	●	Junior Researcher Grant Project: Neuro-epigenetic mechanisms of aberrant memory processing in PTSD – Towards a new road of intervention	245 000,-
Deutsche Forschungsgemeinschaft (DFG) & Netherlands Organization for Scientific Research (NWO) 2018	●	Open Research Area Funding Scheme Project: Stress effects on memory accuracy versus generalisation: Testing a new model based on influencing the temporal dynamics of memory consolidation	1 041 000,-
Netherlands Organization for Scientific Research (NWO) 2015	●	Veni Grant Project: Neural networks of post-traumatic stress disorder: natural resilience as key for intervention	250 000,-
KNAW 2015	●	Selected Participant for the Lindau Nobel Laureate Meeting To participate in the annual gathering of Nobel Laureates in Physics, Chemistry and Physiology and young, talented scientists, to discuss the future of science and beyond	
Dutch Neurofederation 2015	●	Poster Prize Dutch Neuroscience Meeting	250,-
Dutch Neurofederation 2014	●	PhD Thesis Award Award for the best Dutch PhD thesis in Neuroscience of 2013	1 000,-
Weizmann Institute of Science 2012	●	Feinberg Graduate School Research Grant Project: Dissecting the central stress response: Elucidating the role of the extended amygdala CRF system in modulating stress-induced psychopathologies	25 000,-
Niels Stensen Foundation 2012	●	Niels Stensen Stipendium Project: Dissecting the central stress response: Elucidating the role of the extended amygdala CRF system in modulating stress-induced psychopathologies	34 000,-
Netherlands Organization for Scientific Research (NWO) 2008	●	Toptalent Grant Project: When we cannot forget: Probing the mechanistic underpinnings of stress-related memories	180 000,-
FENS/IBRO WERC, EEBS, HBM, NSFw, Gordon research, RU 2008-2015	●	Travel Grants Awarded to attend international conferences	6 950,-

PEER-REVIEWED PUBLICATIONS

Scientific Articles

1. Song Q, Bolsius YG, Ronzoni G, **Henckens MJ**, Roozendaal B (2020). Noradrenergic enhancement of object recognition and object location memory in mice. *Stress* [epub ahead of print]
2. Everaerd DS, **Henckens MJ**, Bloemendaal M, Bovy L, Kaldewaij R, Maas FMWM, Mulders PCR, Niermann HCM, van de Pavert I, Przewdzik I, Fernández G Klumpers F, de Voogd LD (2020). Good vibrations: An observational study of real-life stress induced by a stage performance. *PNEC* 114:104593.
3. Schipper P, Hiemstra M, Bosch K, Nieuwenhuis D, Adinolfi A, Glotzbach S, Borghans B, Lopresto D, Fernández G, Klumpers F, Hermans EJ, Roelofs K, Homberg JR*, **Henckens MJ*** (2019). The association between serotonin transporter availability and the neural correlates of fear bradycardia. *Proc Natl Acad Sci U S A* 116(51):25941-25947.
*: equal contributions
4. Schipper P, Brivio P, de Leest D, Madder L, Asrar B, Rebuglio F, Verheij MMM, Kozicz T, Riva MA, Calabrese F, **Henckens MJ**, Homberg JR (2019). Impaired fear extinction recall in serotonin transporter knockout rats is transiently alleviated during adolescence. *Brain Sci* 9(5).
5. **Henckens MJ***, Kroes MC*, Homberg JR (2019). How serotonin transporter gene variance affects defensive behaviours along the threat imminence continuum. *Curr Opin Behav Sci* 26:25-31. *: equal contributions
6. Schipper P, **Henckens MJ**, Lopresto D, Kozicz T, Homberg JR (2018). Acute inescapable stress alleviates fear extinction recall deficits caused by serotonin transporter abolishment. *Behav Brain Res* 346:16-20.
7. Schipper P, **Henckens MJ**, Borghans B, Hiemstra M, Kozicz T, Homberg JR (2018). Prior fear conditioning does not impede enhanced active avoidance in serotonin transporter knockout rats. *Behav Brain Res* 326:77-86.
8. Dirven BCJ, Homberg JR, Kozicz T, **Henckens MJ** (2017). Epigenetic programming of the neuroendocrine stress response by adult life stress. *J Mol Endocrinol* 59(1):R11-R31.
9. van Bodegom M, Homberg JR, **Henckens MJ** (2017). Modulation of the Hypothalamic-Pituitary-Adrenal Axis by Early Life Stress Exposure. *Front Cell Neurosci* 11:87.
10. **Henckens MJ**, Printz Y, Shamgar U, Dine J, Lebow M, Drori Y, Kuehne C, Kolarz A, Eder M, Deussing JM, Justice NJ, Yizhar O, Chen A (2017). CRF receptor type 2 neurons in the posterior bed nucleus of the stria terminalis critically contribute to stress recovery. *Mol Psychiatry* 22(12):1691-1700.
11. **Henckens MJ**, Deussing JM, Chen A (2016). Region-specific roles of the corticotropin-releasing factor-urocortin system in stress. *Nat Rev Neurosci* 17(10):636-51.
12. **Henckens MJ**, Klumpers F, Everaerd D, Kooijman SC, van Wingen GA, Fernández G (2016). Interindividual differences in stress sensitivity: basal and stress-induced cortisol levels differentially predict neural vigilance processing under stress. *Soc Cogn Affect Neurosci* 11(4):663-73.
13. Schipper P, Lopresto D, Reintjes RJ, Joosten J, **Henckens MJ**, Kozicz T, Homberg JR (2015). Improved Stress Control in Serotonin Transporter Knockout Rats: Involvement of the Prefrontal Cortex and Dorsal Raphe Nucleus. *ACS Chem Neurosci* 6(7):1143-50.
14. Hermans EJ, **Henckens MJ**, Joëls M, Fernández G (2015). Toward a mechanistic understanding of interindividual differences in cognitive changes after stress: reply to van den Bos. *Trends Neurosci* 38(7):403-4.
15. **Henckens MJ**, van der Marel K, van der Toorn A, Pillai AG, Fernández G, Dijkhuizen RM, Joëls M (2015). Stress-induced alterations in large-scale functional networks of the rodent brain. *NeuroImage* 105:312-22.
16. Pillai AG, **Henckens MJ**, Fernández G, Joëls M (2014). Delayed effects of corticosterone on slow afterhyperpolarization potentials in mouse hippocampal versus prefrontal cortical pyramidal neurons. *PLoS One* 9(6):e99208.
17. Hermans EJ, **Henckens MJ**, Joëls M, Fernández G (2014). Dynamic adaptation of large-scale brain networks in response to acute stressors. *Trends Neurosci* 37(6):304-14.
18. Hermans EJ, **Henckens MJ**, Roelofs K, Fernández G (2013). Fear bradycardia and activation of the human periaqueductal grey. *NeuroImage* 66:278-87.
19. **Henckens MJ**, van Wingen GA, Joëls M, Fernández G (2012). Time-dependent effects of cortisol on selective attention and emotional interference: a functional MRI study. *Front Integr Neurosci* 6:66.
20. **Henckens MJ**, van Wingen GA, Joëls M, Fernández G (2012). Corticosteroid induced decoupling of the amygdala in men. *Cereb Cortex* 22(10):2336-45.
21. **Henckens MJ**, Pu Z, Hermans EJ, van Wingen GA, Joëls M, Fernández G (2012). Dynamically changing effects of corticosteroids on human hippocampal and prefrontal processing. *Hum Brain Mapp* 33(12):2885-97.
22. **Henckens MJ**, van Wingen GA, Joëls M, Fernández G (2011). Time-dependent corticosteroid modulation of prefrontal working memory processing. *Proc Natl Acad Sci U S A* 108(14):5801-6.

23. Hermans EJ, **Henckens MJ***, van Marle HJ*, Ossewaarde L*, Qin S*. van Kesteren MT*. Schoots VC*. Cousijn H*, Rijpkema M, Oostenveld R, Fernández G (2011). Stress-related noradrenergic activity prompts large-scale neural network reconfiguration. *Science* 334(6059):1151-3. *: equal contributions
24. **Henckens MJ**, van Wingen GA, Joëls M, Fernández G (2010). Time-dependent effects of corticosteroids on human amygdala processing. *J Neurosci* 30(38):12725-32.
25. **Henckens MJ**, Hermans EJ, Pu Z, Joëls M, Fernández G (2009). Stressed memories: how acute stress affects memory formation in humans. *J Neurosci* 29(32):10111-9.
26. Meijer JT, **Henckens MJ**, Minten IJ, Lowik DWPM, van Hest JCM (2007). Disassembling peptide-based fibres by switching the hydrophobic-hydrophilic balance. *Soft Matter* 3:1083-90.
27. Korosi A, Veening JG, Kozicz T, **Henckens MJ**, Dederen J, Groenink L, van der Gugten J, Olivier B, Roubos EW (2006). Distribution and expression of CRF receptor 1 and 2 mRNAs in the CRF over-expressing mouse brain. *Brain Res* 1072(1):46-54.

Book Chapters

1. **Henckens MJAG**, Deussing JM, Chen A (2019). The Role of the CRF-Urocortin System in Stress Resilience. In A Chen (Ed.), *Stress Resilience: Molecular and Psychological Aspects*. Elsevier.
2. Hermans EJ, **Henckens MJAG**, Joëls M, Fernández G (2017). Time-dependent shifts in neural systems supporting decision-making under stress. In JC Dreher & L Tremblay (Eds.), *Decision Neuroscience: Handbook of Reward and Decision Making* (2nd edition). Elsevier.

AD HOC REVIEWER

Scientific Journals

- Behavioural Pharmacology
 - Behavioural Brain Research
 - Biological Psychiatry
 - Brain Research Bulletin
 - Cerebral Cortex
 - European Journal of Neuroscience
 - Frontiers in Behavioral Neuroscience
 - Frontiers in Emotion Neuroscience
- Int J of Neuropsychopharmacology
 - Journal of Neuroscience
 - Neuropsychologia
 - NeuroImage
 - PLoS ONE
 - Psychoneuroendocrinology
 - Social Cognitive and Affective Neurosci

Grant Agencies

- Swiss Science Foundation
- Deutsche Forschungsgemeinschaft

REFERENCES

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