

# Martijn L.T.M. Müller, Ph.D.

Research Investigator

University of Michigan, Department of Radiology  
Functional Neuroimaging, Cognitive and Mobility Laboratory  
Domino's Farms - Suite B1000, Box #362  
24 Frank Lloyd Wright Drive  
Ann Arbor, MI 48106

Phone: 734-998-8422

Email: [mtmuller@umich.edu](mailto:mtmuller@umich.edu)

## Education and Training

9/1992-7/1999: University of Nijmegen M.A.  
(a.k.a. Radboud University),  
the Netherlands

*Major Subject:* Experimental Psychology/Motor Control  
*Thesis title:* The relation between trait anxiety and motor  
performance explained by the neuromotor noise theory  
*Advisor:* Prof. Dr. Gerard P. van Galen

9/1999-6/2007: University of Amsterdam, Ph.D.  
the Netherlands

*Major Subject:* Experimental Psychology/Motor Control  
*Thesis title:* Attentional components of postural control  
*Advisor:* Prof. Dr. Maurits A.W. van der Molen

## Academic Appointments

9/1999 –6/2006: Research Associate, University of Pittsburgh, Department of Otolaryngology.  
7/2006 – 9/2007: Research Lab Specialist Senior, University of Michigan, Department of Radiology.  
10/2007 – present: Research Investigator, University of Michigan, Department of Radiology.

## Research Interest

- Neuroimaging (MR/PET) of motor control, in particular of balance and gait functions.
- Falls and falls prevention
- Cognition
- Aging and Parkinson Disease
- Depression
- Biomechanics

## Grants

### Present and Active Grants

1. NIH/NIA (PI: Muller): 09/2009 – 08/2011. 'White Matter Lesions and Cortical Serotonergic Deafferentation in Older Adults.' Role: Principal Investigator.

2. NIH (PI: Frey): 9/2008-6/2013. 'PET Study of Biochemistry and Metabolism of the CNS.' Role: Research Investigator.
3. NIH/NIA (PI: Halter), Sub only: University of Michigan Claude D. Pepper Older Americans Independence Center: 8/2008-7/2009. 'The Relationship between Brain White Matter Abnormalities, Cognition and the Biomechanics of (Dual-Task) Balance and Gait in Older Adults.' Role: Project Director.
4. Pfeiffer Foundation (PI: Seidler): 1/2008-12/2009. 'Parkinson's Disease: Interactions between Stage of Disease, Treatment, and Motor and Cognitive Performance.' Role: Research Investigator.
5. Michael J. Fox Foundation, (PI: Albin): 11/2007 – 10/2010. 'Serotonin and Sleep Disordered Breathing in Parkinson Disease.' Role: Research Investigator
6. Veterans Administration, (PI: Bohnen): 06/2006 - 05/2010. 'Striatal and Extra-Striatal Mechanisms of Falling in Parkinson's Disease'. Role: Research Investigator.

### Previous Grants

1. Michael J. Fox Foundation, (PI: Bohnen): 09/2005 – 08/2008. 'Executive, ADL, and Cholinergic Functions in PD.' Role: Research Investigator.
2. NIH/NIA, (PI: Halter), Sub Only: University of Michigan Claude D. Pepper Older Americans Independence Center, (PI: Bohnen): 8/2006-7/2009. 'Oculomotor bradykinesia, visuospatial attention, dopamine and risk of falling in the elderly.' Role: Research Investigator.

### Submitted Grants

1. Michael J. Fox Foundation, (PI: Muller): Pending. 'Cholinergic and Dopaminergic Mechanisms Underlying Postural Instability and Gait Disturbances in Parkinson Disease.' Role: Principal Investigator.

## **Memberships in Professional Societies**

- 2001 – present: International Society for Posture and Gait Research (ISPGR)

## **Peer-Review Service**

Developmental Psychology, Gait & Posture, Human Movement Science, Journal of Neurophysiology, Journal of Psychophysiology, Journal of Vestibular Research, Motor Control.

## **Teaching**

### *University of Pittsburgh*

- Spring term 2005: Danielle Senge (Undergraduate Student Internship)

### *University of Michigan*

- Fall term 2006: Rohit Khattar, B.Sc. (Graduate Student Research Assistant)
- Summer 2007 – Spring term 2008: Chris Bogan (Undergraduate Work Student)
- March 2009 - Ongoing: Monthly speaker at VA Neurology service U of M medical students lecture series: 'Cognitive Assessment and PET Imaging of Dementias'

## **Volunteer Service**

- East-Lansing (MI) Parkinson Disease Support Group presentation (10/2007): ‘Rethinking Parkinson’s Disease: More than Striatal Dopaminergic Denervation.’
- Howell (MI) Parkinson Disease Support Group presentation (04/2008): ‘Rethinking Parkinson’s Disease: More than Striatal Dopaminergic Denervation.’
- Jackson (MI) Parkinson Disease Support Group presentation (05/2008). ‘Rethinking Parkinson’s Disease: More than Striatal Dopaminergic Denervation.’

## Bibliography

### *Peer-reviewed Journals and Publications*

- Van Galen, GP, & **Müller, MLTM** (2001). Stress, neuromotorische ruis en spierspanning en het ontstaan van RSI [Stress, neuromotor noise and muscular tension as ingredients for an etiological model of repetitive strain injuries]. *Tijdschrift voor Ergonomie*, 26 (2), 3-18. [Dutch]
- Redfern MS, **Müller MLTM**, Jennings JR, & Furman JM (2002). Attentional dynamics in postural control during perturbations in young and older adults. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, 57 (8), B298-303.
- Van Galen GP, **Müller MLTM**, Meulenbroek RG, & Van Gemmert AWA (2002). Forearm EMG response activity during motor performance in individuals prone to increased stress reactivity. *American Journal of Industrial Medicine*, 41 (5), 406-419.
- Furman JM, **Müller MLTM**, Redfern MS, & Jennings JR (2003). Visual-vestibular stimulation interferes with information processing in young and older adults. *Experimental Brain Research*, 152 (3), 383-392.
- **Müller MLTM**, Jennings JR, Redfern MS, & Furman JM (2004). Effect of preparation on dual-task performance in postural control. *Journal of Motor Behavior*, 36 (2), 137-146.
- **Müller MLTM**, & Redfern MS (2004). Correlation between EMG and COP onset latency in response to a horizontal platform translation. *Journal of Biomechanics*, 37 (10), 1573-1581.
- **Müller MLTM**, Redfern MS, & Jennings JR (2007). Postural prioritization defines the interaction between a reaction time task and postural perturbations. *Experimental Brain Research*, 183, 447-456.
- Bohnen NI, **Müller MLTM**, Kuwabara H, Constantine GM, & Studenski SA (2009). Age-associated leukoaraiosis and cortical cholinergic deafferentation. *Neurology*, 72, 1411-1416.
- Bohnen NI, **Müller MLTM**, Kuwabara H, Cham R, Constantine GM, & Studenski SA (2009). Age-associated nigrostriatal dopaminergic denervation and falls in community-dwelling subjects, *Journal of Rehabilitation Research and Development*, Accepted.
- Bohnen NI, **Müller MLTM**, Koeppel RA, Studenski SA, Kilbourn MA, Frey KA, & Albin RL (2009). History of falls in Parkinson disease is associated with reduced cholinergic activity, *Neurology*, Accepted.
- Bohnen NI, Bogan, CW, & **Müller MLTM** (2009). Frontal and periventricular brain white matter lesions and cortical deafferentation of cholinergic and other neuromodulatory axonal projections, *The European Neurological Journal*, Accepted.

### *Abstracts*

- Van Galen GP, & **Müller MLTM** (1999). Stress, spierstijfheid en de neuromotorische ruistheorie: Een EMG-studie [Stress, muscle stiffness and the neuromotor noise theory: an EMG study]. *De Psychonoom*, 14 (S), 25-26.
- Furman JM, Redfern MS, **Müller MLTM**, & Jennings JR (2001). Influence of vestibular stimulation and visual-vestibular interaction on cognitive task performance in young and older humans. *Association for Research in Otolaryngology Midwinter Research Meeting, abstract #413*.

- **Müller MLTM**, Redfern MS, Jennings JR, & Furman JM (2001). Temporal dynamics of attention during a postural control task. In: *Control of Posture and Gait*. Eds: J Duysens, BCM Smits-Engelsman, & H Kingma.
- Redfern MS, Jennings JR, **Müller MLTM**, & Furman JM (2001). Attentional effects during postural perturbations in young and older adults. *Association for Research in Otolaryngology Midwinter Research Meeting, abstract #414*.
- Redfern MS, **Müller MLTM**, Jennings JR, & Furman JM (2001). Attentional dynamics in older adults during perturbations. In: *Control of Posture and Gait*. Eds: J Duysens, BCM Smits-Engelsman, & H Kingma.
- Furman JM, **Müller MLTM**, Redfern MS, & Jennings JR (2003). Vestibular-induced eye movements while performing an information processing task in young and older humans. *Association for Research in Otolaryngology Midwinter Research Meeting, abstract #332*.
- **Müller MLTM**, Jennings JR, Redfern MS, & Furman JM (2005). Postural preparation defines the interaction between standing balance and cognitive processes. *Psychophysiology*, 42 (S1), S93.
- **Müller MLTM**, Redfern MS, Jennings JR, & Furman JM (2005). The interaction between cognitive and postural processes: A 'posture-first' principle? *Gait & Posture*, 21 (S1), S54-S55.
- Redfern MS, **Müller MLTM**, Furman, JM, & Jennings JR (2005). Postural prioritization defines the interaction between cognitive and postural task processes. *Association for Research in Otolaryngology Midwinter Research Meeting, abstract #179*.
- **Müller MLTM**, Constantine GM, Moore RY, & Bohnen NI (2007). Postural sway and striatal dopaminergic denervation in Parkinson disease and healthy aging adults. *Proceedings of the International Society of Posture and Gait Research*, 41, Burlington VT.
- **Müller MLTM**, Kuwabara H, Constantine GM, Moore RY, & Bohnen NI (2007). Postural sway as a biomarker of dopaminergic denervation in patients with mild Parkinson's disease. *Journal of Nuclear Medicine*, 48 (S2), 9P.
- Redfern MS, **Müller MLTM**, & Jennings, JR (2007). Attention influence sensory integration during standing posture. *Proceedings of the International Society of Posture and Gait Research*, 29, Burlington VT.
- Kwak Y, **Müller MLTM**, Bohnen NI, Huismann DJ, & Seidler RD (2008). Impaired early learning of explicit motor sequences by dopaminergic medications in Parkinson's disease. *Movement Disorders*, 23 (S1), S100.
- Kwak Y, **Müller MLTM**, Bohnen NI, & Seidler RD (2008). Impaired early learning of explicit motor sequences by dopaminergic medications in Parkinson's disease. *Society for Neuroscience, November*, Washington DC.
- Bohnen NI, **Müller MLTM**, Syré P, Ziolkowski S, & Studenski SA (2008). Basal ganglia MRI hyperintensities and falls in community-dwelling elderly. *Neurology*, 70 (S1), A68.
- Bohnen NI, Frey KA, Koeppe RA, **Müller MLTM**, Kilbourn MA, & Albin RL. (2008). Cerebellar acetylcholinesterase activity and parkinsonian motor impairment. *Journal Nuclear Medicine*, 49 (Suppl 1), 222P.
- **Müller MLTM**, Studenski SA, & Bohnen NI (2008). Fall history is associated with severity of white matter changes but not striatal dopaminergic denervation. *Parkinsonism & Related Disorders*, 14 (S1), S5
- Kuwabara H, **Müller MLTM**, & Bohnen NI (2008). A constrained analysis improved estimates of acetylcholinesterase density with [<sup>11</sup>C]PMP and PET. *Journal Nuclear Medicine*, 49 (Suppl 1), 118P.

- Bogan C, Bohnen N, Koeppe R, Frey K, Albin R, & **Müller MLTM** (2008). Age-associated dopaminergic influences on foot-tapping and temporal gait parameters in healthy older adults. *Proceedings of the North American Congress on Biomechanics, August, Ann Arbor, MI, Abstract 372.*
- Kotagal V, **Müller MLTM**, Koeppe RA, Frey KA, Albin RL, & Bohnen NI (2009). Executive dysfunction in Parkinson's disease is more closely associated with cortical cholinergic than with nigrostriatal dopaminergic denervation. *Neurology, 72 (suppl 3), A264-A265.*
- Kotagal V, **Müller MLTM**, Koeppe RA, Frey KA, Albin RL, & Bohnen NI (2009). Parkinson and Alzheimer-selective hyposmia measures have different neurochemical substrates in patients with Parkinson's disease. *Neurology, 72 (suppl 3), A146.*
- Bogan CW, **Müller MLTM**, Koeppe RA, Kilbourn MA, Albin RL, Frey KA, & Bohnen NI (2009). Variability in foot-tapping as a new biomarker of nigrostriatal denervation in Parkinson's disease. *Journal of Nuclear Medicine, 50 (S2), 128.*
- Bogan CW, Ma Y, Eidelberg D, **Müller MLTM**, & Bohnen NI (2009). Associations between a measure of brain network metabolic activity and non-motor measures of Parkinson's disease. *Journal of Nuclear Medicine, 50 (S2), 1248.*
- Bogan CW, Kuwabara H, **Müller MLTM**, & Bohnen NI (2009). Age-associated nigrostriatal dopaminergic denervation and falls in community-dwelling subjects. *Journal of Nuclear Medicine, 50 (S2), 1243.*
- Bogan CW, Ma Y, **Müller MLTM**, & Bohnen NI (2009). Feasibility of carbon-11-dihydrotetrabenazine ligand influx images in a principal component based analysis. *Journal of Nuclear Medicine, Accepted.*
- Bohnen NI, **Müller MLTM**, Koeppe RA, Frey KA, & Albin RL (2009). Postural Instability and Gait Difficulty (PIGD) score is independently associated with both cerebellar cholinergic and nigrostriatal dopaminergic activity In PD. *Neurology, 72 (suppl 3), A166.*
- Bohnen NI, **Müller MLTM**, Kuwabara H, Constantine GM, & Studenski SA (2009). Age-associated leukoaraiosis and cortical cholinergic deafferentation. *Neurology, 72 (suppl 3), A436.*
- Bohnen NI, Frey KA, **Müller MLTM**, Koeppe RA, Kilbourn MA, & Albin RL (2009). History of falls in Parkinson disease is associated with reduced cholinergic but not nigrostriatal dopaminergic activity. *Journal of Nuclear Medicine, 50 (S2), 1235.*
- Bohnen NI, **Müller MLTM**, Koeppe RA, Kilbourn MA, Albin RL, & Frey KA (2009). Heterogeneity of neurodegeneration in Parkinson disease: variable degree of dopaminergic versus cholinergic denervation. *Journal of Nuclear Medicine, 50 (S2), 129.*
- Bohnen NI, **Müller MLTM**, Koeppe RA, Kilbourn MA, Frey KA, & Albin RL (2009). Ratings of activities of daily living are associated with cortical cholinergic but not with the degree of nigrostriatal dopaminergic activity in Parkinson disease. *Journal of Nuclear Medicine, 50 (S2), 1250.*
- **Müller MLTM**, Albin RA, Koeppe RA, Frey KA, & Bohnen NI (2009). Monoaminergic and cholinergic correlates of falling in Parkinson disease, *Proceedings of the International Society of Posture and Gait Research, Bologna (Italy), O.74.*