

BIOGRAPHICAL SKETCH

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NAME M. Felice Ghilardi	POSITION TITLE Associate Professor		
eRA COMMONS USER NAME ghilardim			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University degli Studi, Milano, Italy	MD	1983	Medicine
University degli Studi, Milano, Italy	Specialist	1987	Neurology

A. Personal statement

The focus of the research is on the characterization of motor control and motor learning and on the definition of the neural correlates of such motor behaviors using High Density (HD) EEG, MRI and PET. In addition, we are studying the role of sleep in the learning and consolidation of motor skills using HD-EEG.

These studies are conducted in normal subjects and in patient populations with different neurodegenerative diseases. Our lab is part of the Center of Excellence for Aging Studies at New York University and we take advantage of a normally aging population of more than five hundreds of normal subjects who have been tested with extensive neuropsychological batteries and biochemical studies. In addition, the studies on sleep and learning are performed in collaboration with Dr. Tononi.

B. Positions**Positions and Employment**

2007-present Adjunct Associate Professor, Dept. of Neurology, NYU Medical School, New York
 2010-present Associate Professor, Research Director, Dep. of Physiology & Pharmacology, CUNY Medical School, New York, NY
 2007-2009 Adjunct Assistant Professor, Dept. of Neurology, NYU Medical School, New York
 2006-2009 Assistant Professor, Research Director, Dep. of Physiology & Pharmacology, CUNY Medical School, New York, NY
 1996- 2006 Associate Research Scientist, Center for Neurobiology & Behavior, Columbia University, College of Physicians and Surgeons, New York, NY
 1990-1996 Assistant Research Scientist, Center for Neurobiology & Behavior, NY State Psychiatric Institute, New York, NY
 1985-1999 Fellow, Mount Sinai School of Medicine, Department of Neurology, New York, NY

Professional Memberships

2007- Sleep Research Society
 1990 - Society for Neuroscience
 1993 - Italian Society for Neuroscience

C. Selected peer-reviewed publications (in chronological order from 2000).

McIntosh AR, Ghilardi MF, Sporns O. Overview: integrating computational, cognitive and clinical expertise to understand brain network recovery. Arch Ital Biol, 2010, in press

Perfetti B, Moissello C, Lanzafame S, Varanese S, Landsness E, Onofri M, Di Rocco A, Tononi G, Ghilardi MF. Attention modulation regulates both motor and non-motor performance: a high-density EEG study in Parkinson's disease. Arch Ital Biol, 2010, in press

Marinelli L, Perfetti B, Moissello C, Di Rocco A, Eidelberg D, Abbruzzese G, Ghilardi MF. Increased reaction time predicts visual learning deficits in Parkinson's disease. Mov Disord. 2010; 25: 1498-1501.

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- Määttä S, Landsnæs E, Sarasso S, Ferrarelli F, Ferreri F, Ghilardi MF, Tononi G. The effects of morning training on night sleep: A behavioral and EEG study. *Brain Res Bull*. 2010 Jan 25. [Epub ahead of print]
- Carbon M, Reetz K, Ghilardi MF, Dhawan V, Eidelberg D. Early Parkinson's disease: longitudinal changes in brain activity during sequence learning. *Neurobiol Dis*. 2010; 37:455-460
- Landsnæs EC, Crupi D, Hulse BK, Peterson MJ, Huber R, Ansari H, Coen M, Cirelli C, Benca RM, Ghilardi MF, Tononi G. Sleep-dependent improvement in visuomotor learning: a causal role for slow waves. *Sleep*. 2009; 32:1273-84
- Landsnæs EC, Crupi D, Hulse BK, Peterson MJ, Huber R, Ansari H, Coen M, Cirelli C, Benca RM, Ghilardi MF, Tononi G. Sleep-dependent improvement in visuomotor learning: a causal role for slow waves. *Sleep*. 2009; 32:1273-84.
- Moisello C, Crupi D, Tunik E, Quartarone A, Bove M, Tononi G, Ghilardi MF. The serial reaction time task revisited: a study on motor sequence learning with an arm-reaching task. *Exp Brain Res*. 2009;194:143-155.
- Ghilardi MF, Moisello C, Silvestri G, Ghez C, Krakauer JW. Learning of a sequential motor skill comprises explicit and implicit components that consolidate differently. *J Neurophysiol*. May;101(5):2218-29.
- Marinelli L, Crupi D, Di Rocco A, Bove M, Eidelberg D, Abbruzzese G, Ghilardi MF. Learning and consolidation of visuomotor adaptation in Parkinson's disease. *Parkinsonism & Rel. Disorders*. 2009 Jan;15(1):6-11.
- Argyelan M, Carbon M, Ghilardi MF, Feigin A, Mattis P, Tang C, Dhawan V, Eidelberg D. Dopaminergic suppression of brain deactivation responses during sequence learning. *J Neurosci*. 2008 Oct 15;28(42):10687-95.
- Hill S, Tononi G, Ghilardi MF. Sleep improves the variability of motor performance. *Brain Res Bull*. 2008 Aug 15;76(6):605-11. Epub 2008 Mar 10
- Marinelli L, Crupi D, Di Rocco A, Bove M, Eidelberg D, Abbruzzese G, Ghilardi MF. Learning and consolidation of visuomotor adaptation in Parkinson's disease. *Parkinsonism & Rel. Disorders*. In press
- Ghilardi MF, Silvestri G, Feigin A. et al. , Implicit and explicit aspects of sequence learning in pre-symptomatic Huntington's disease. *Parkinsonism & Rel. Disorders*. In press
- Carbon M, Ghilardi MF, Dhawan V, Eidelberg D. Correlates of movement initiation and velocity in Parkinson's disease: A longitudinal PET study. *Neuroimage*. 2007 Jan 1;34(1):361-70. Epub 2006 Oct 24.
- Bove M, Tacchino A, Novellino A., Trompetto C, Abbruzzese G, Ghilardi MF. The effects of rate and sequence complexity on repetitive finger movements. *Brain Res*. 2007 Jun 11;1153:84-91. Epub 2007 Mar 28
- Battaglia F, Wang HY, Ghilardi MF, Gashi E, Quartarone A, Friedman A, Nixon RA. Cortical plasticity in Alzheimer's disease in humans and rodents. *Biological Psychiatry*, 2007 Jul 23; [Epub ahead of print]
- Ghilardi MF, Feigin AS, Battaglia F, Silvestri G, Mattis P, Eidelberg D, Di Rocco A. L-Dopa infusion does not improve explicit sequence learning in Parkinson's disease. *Parkinsonism & Rel. Disorders*. 2007:146-51.
- R Huber, M.F Ghilardi, M Massimini, F Ferrarelli, B A. Riedner, M J. Peterson, G Tononi, Arm immobilization, cortical plasticity, and local sleep homeostasis. *Nature Neurosci.*, 2006;9:1169-76.
- F Battaglia, A Quartarone, MF Ghilardi, R Dattola, S Bagnato, V Rizzo, L Morgante, G Girlanda. Cerebellar stroke disrupts movement preparation and motor imagery. *Clin Neurophysiol*. 2006;117:1009-16.
- Feigin A, Ghilardi MF, et al. Huntington's disease: compensatory brain responses during learning. *Ann Neurol*. 2006, 59:53-9.
- Krakauer JW, Ghez C, Ghilardi MF Adaptation to visuomotor transformations: consolidation, interference, and forgetting. *J Neurosci*. 2005; 25:473-8.
- Huber R, Ghilardi MF, Massimini M, Tononi G. Local sleep and learning. *Nature*, 2004, 430:78-81.
- Carbon M, Ma Y, Barnes A, Dhawan V, Chaly T, Ghilardi MF, Eidelberg D. Caudate nucleus: influence of dopaminergic input on sequence learning and brain in parkinsonism. *Neuroimage.*, 2004, 21:1497-507.
- Krakauer, J.W., Ghilardi MF, et al., Differential Cortical and Subcortical activations in the learning of visuomotor transformations for reaching: a PET study. *J Neurophysiol*. 2004, 91:924-33.
- Carbon M, Trost M, Ghilardi MF, Eidelberg D. Abnormal brain networks in primary torsion dystonia. *Adv Neurol*. 2004;94:155-61.
- Mentis MJ, Dhawan V, Nakamura T, Ghilardi MF, Feigin A, Edwards C, Ghez C, Eidelberg D. Enhancement of brain activation during trial-and-error sequence learning in early PD. *Neurology*. 2003; 60:612-9.
- Ghilardi MF, Eidelberg D, Silvestri G, Ghez C. The differential effects of aging and PD on early explicit sequence learning. *Neurology*, 2003, 60:1313-1319.
- Carbon M, Ghilardi M, Feigin A, et al. Learning networks in health and Parkinson's disease: Reproducibility and treatment effects. *Hum. Brain Mapping* 11:197-211, 2003.
- Ghilardi MF, Carbon M, Silvestri G, Dhawan V, Tagliati M, Bressman S, Ghez C, Eidelberg D. Impaired Sequence Learning in Carriers of the DYT1 Dystonia Mutation. *Ann Neurol.*, 2003, 54:102-109.
- Feigin A, Ghilardi MF, Fukuda M, Mentis M, Dhawan V, Ghez C, Eidelberg D. Effects of Levodopa Infusion on Motor Activation Responses in Parkinson's Disease. *Neurology*, 2002, 59:220-6

Fukuda M, Ghilardi MF, et al. Pallidal Stimulation For Parkinsonism: Improved Brain Activation During Sequence Learning, *Ann Neurol*. 2002, 52:144-52.

Nakamura T, Ghilardi MF, M. Mentis, V. Dhawan, J.R. Moeller, C. Ghez, D. Eidelberg. Functional Networks in Motor Sequence Learning: Abnormal Topographies in PD. *Hum Brain Mapping* 2001,12 42-60.

Fukuda M, Mentis M, Ghilardi MF, et al. Brain activation responses with internal pallidal stimulation for Parkinson's disease. *Ann. Neurology*, 2001: 49: 155-164.

Ghilardi MF, Ghez C, Dhawan V, Moeller J., Eidelberg D et al. . Pattern of regional brain activation associated with different forms of learning. *Brain Res.*, 2000: 871: 127-145

Ghilardi MF, Alberoni M, Rossi M, Franceschi M. Visual feedback has differential effects on reaching movements in Parkinson's Disease. *Brain Res.*, 2000, 876: 112-123.

D. Research Support.

Ongoing Research Support

Dates of Project: 08/01/20/05 – 11/30//2010

University of Toronto/McDonnell Foundation (A.R. McIntosh, PI)

"Network Mechanisms Underlying Cognition and Recovery of Function in the Human Brain"

This project will focus on studies of effective connectivity utilizing transcranial magnetic stimulation (TMS) and high-density electroencephalography (hd-EEG).

Role: P.I. on subcontract, 0.24 calendar

Project Number: R01 NS055185 (G. Tononi, PI)

NINDS

Dates of projects: 04/01/06-03/31/11

"Local Sleep Regulation and Brain Plasticity"

To advance our understanding of the functions of sleep at the fundamental level, the overall goal of this project is to test a recent, comprehensive hypothesis about the function of non-rapid eye movement sleep – the synaptic homeostasis hypothesis.

Role: P.I. on subcontract, 2.4 calendar

Project Number: R01 NS054864 (Ghilardi MF, PI)

NINDS

Dates of projects: 12/01/06-11/30/11

"Consolidation of Motor Skills and Sleep Homeostasis in Parkinson's Disease"

This study will ascertain whether non-rapid eye movement sleep abnormalities in PD are associated to impairment of memory consolidation.

Role: P.I., 4.0 calendar

Dates

Completed Research

Project Number 5 K08 NS01961 Ghilardi (PI)

Dates of Project: 12/01/97 – 01/31/05

Source: NINDS

Motor Learning in Parkinson's Disease

The specific aims of this project are 1) to determine the effect of Parkinson's disease on the learning of spatial and temporal features of motor learning tasks, compared to a normally aging population; 2) to test the hypothesis that the deficits in motor learning in PD result from the altered function of specific cortical and subcortical networks whose expression correlates with task performance in age-matched controls; 3) to assess the effect on motor learning of new therapies, such as pallidal ablation and pallidal stimulation.

Role: PI

Project Number: RO1 NS 047668 (David Eidelberg, PI)

Dates of Project: 09/20/04 – 06/30/08

Status: ONGOING

Source: NIH/NINDS

"Brain and Behavior in Dystonia: A Multicenter Study"

This study will delineate the anatomical distribution of functional alterations in the brain in manifesting and non-manifesting gene carriers of dystonia genes using Positron Emission Tomography (PET), and will determine the mode of action of novel therapeutic interventions in these conditions.

Role: P.I. on subcontract, 3.0 calendar

Dates of Project: 02/01/20/06 – 01/31//2010

Source: National Parkinson Foundation, Large grants, (MF Ghilardi, PI)

"Mood and Movement in Parkinson's Disease"

This study is characterizing depression in patients with Parkinson's disease and defining relations of depressive symptoms with motor problems, and cognitive abnormalities of this disease.

Role: PI, 0.24 calendar