

## CURRICULUM VITAE

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**Pablo A. Celnik, M.D.**


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**July 1, 2016**
**DEMOGRAPHIC INFORMATION****CURRENT APPOINTMENTS:**

2016- present Director, Department of Physical Medicine and Rehabilitation (PMR), Johns Hopkins.  
 2016- present Lawrence Cardinal Shehan Professor, Department of PMR, Johns Hopkins  
 2015- present Professor, Department of Neurology, Johns Hopkins  
 2015- present Professor, Department of Neuroscience, Johns Hopkins  
 2006- present Director, Human Brain Physiology Laboratory, Johns Hopkins  
 2004- present Medical Director, Outpatient Neurorehabilitation Program, PMR Department, Johns Hopkins  
 2011- present Vice Chair for Research, PMR Department, Johns Hopkins

**Personal Data**

Physical Medicine and Rehabilitation  
 Johns Hopkins Hospital – Phips 160  
 600 North Wolfe St  
 Baltimore, MD 21287  
 Office Phone: (410) 502-2446 Fax: (410) 502-2420  
 Lab phone: (443) 923-2723 Fax: (410) 502-4900  
 e-mail address: [pcelnik@jhmi.edu](mailto:pcelnik@jhmi.edu)  
 Web site: <http://celniklab.johnshopkins.edu/>

**EDUCATION AND TRAINING:**

## Undergraduate

1985 Baccalaureate, Colegio Manuel Dorrego, Buenos Aires, Argentina

## Doctoral degree

1990 MD, University of Buenos Aires School of Medicine, Argentina.

## Postdoctoral

1990-1991 Intern, J M Ramos Mejia Hospital, University of Buenos Aires, Argentina.  
 1992-1994 Resident, Neurology, French Hospital, University of Buenos Aires, Argentina  
 1994-1996 Fellow, Neurological Rehabilitation, University of Maryland School of Medicine, Baltimore  
 1996-1997 Fellow, Human Motor Control Section, NINDS, NIH, Bethesda, MD.  
 1999-2000 Intern, Saint Barnabas Medical Center, Livingston, New Jersey.  
 2000-2003 Resident, Physical Medicine and Rehabilitation, Johns Hopkins Hospital, Baltimore, MD  
 2003-2006 Visiting Fellow, Human Cortical Physiology Section, NINDS, NIH, Bethesda, MD.

**PROFESSIONAL EXPERIENCE:**

1987-1989 Anatomy Instructor, School of Medicine, University of Buenos Aires, Buenos Aires, Argentina  
 1988-1994 Neurophysiology Instructor, University of Buenos Aires, Buenos Aires, Argentina  
 1997-1999 Medical Director Neurorehabilitation, FLENI Institute, Buenos Aires, Argentina.  
 1997-1999 Neurology Attending, FLENI Institute, Buenos Aires, Argentina.  
 1998-1999 Co-Director, FLENI Rehabilitation Hospital Development, Buenos Aires, Argentina.  
 2003-2006 Clinical Fellow, Human Cortical Physiology Section, NINDS, NIH, Bethesda, MD.  
 2003- 2009 Assistant Professor, Department of PMR, Johns Hopkins, Baltimore, MD  
 2004- 2009 Assistant Professor, Department of Neurology, Johns Hopkins, Baltimore, MD

- 2004- present Medical Director, Outpatient Neurorehabilitation Program, Department of PMR, Johns Hopkins, Baltimore, MD
- 2006- present Director, Human Brain Physiology and Stimulation Laboratory, PMR, Johns Hopkins, Baltimore, MD
- 2009- 2014 Associate Professor, Department of PMR, Johns Hopkins, Baltimore, MD
- 2009- 2014 Associate Professor, Department of Neurology, Johns Hopkins, Baltimore, MD
- 2010- 2014 Associate Professor, Department of Neuroscience, Johns Hopkins, Baltimore, MD
- 2011- present Vice Chair for Research, Department of PMR, Johns Hopkins, Baltimore, MD
- 2015- present Interim Director, Department of Physical Medicine and Rehabilitation (PMR), Johns Hopkins.
- 2015- present Professor, Department of PMR, Johns Hopkins
- 2015- present Professor, Department of Neurology, Johns Hopkins
- 2015- present Professor, Department of Neuroscience, Johns Hopkins

## RESEARCH ACTIVITIES

	All	Since 2011
<b>Citations</b>	<b>7532</b>	<b>4730</b>
<b>h-index</b>	<b>33</b>	<b>32</b>
<b>i10-index</b>	<b>46</b>	<b>45</b>

Information from Google Scholars on 5-30-2016

## Peer Reviewed Original Science Publications

1. Bonamico L, **Celnik P**. Syncope and seizure-like activity secondary to acute herpes zoster infection of the trigeminal nerve. *Cephalalgia*. 1995 Jun;15(3):241-2
2. Zeilig G, **Celnik P**, Wagner G, Reynolds G, Drubach DA. Metastatic and Spinal Cord Injury: Acute Rehabilitation Outcome, Post-discharge Placement and One Year Survival. *J Neuro Rehab*. 1996
3. Chen R, Classen J, Gerloff C, **Celnik P**, Wassermann EM, Hallett M, Cohen LG (1997) Depression of motor cortex excitability by low frequency transcranial magnetic stimulation. *Neurology*. 48:1398-1403.
4. Cohen LG, **Celnik P**, Pascual-Leone A, Faiz L, Corwell B, Honda M, Sadato H, Gerloff C, Catala MD, Hallett M. Functional relevance of cross-modal plasticity in the blind (1997) *Nature*. 389:180-182.
5. Cohen LG, Weeks RA, Sadato N, **Celnik P**, Ishii K, Hallett M. Period of susceptibility for cross-modal plasticity in the blind. *Ann Neurol*. 1999;45(4):451-60.
6. Classen J, Steinfeld B, Liepert J, Stefan K, **Celnik P**, Cohen LG, Hess A, Kunesch E, Chen R, Benecke R, Hallett M. Cutaneomotor integration in humans is somatotopically organized at various levels of the nervous system and is task dependent. *Exp Brain Res*. 2000 Jan;130(1):48-59.
7. Liepert J, Hallett M, Samii A, Oddo D, **Celnik P**, Cohen LG, Wassermann EM. Motor cortex excitability in patients with cerebellar degeneration. *Clin Neurophysiol*. 2000 Jul;111(7):1157-64.
8. **Celnik P**, Cohen LG. Modulation of motor function and cortical plasticity in health and disease. *Restor Neurol Neurosci*. 2004;22(3-5):261-8. Review.
9. Hummel F, **Celnik P**, Giraux P, Floel A, Wu C, Gerloff C, Cohen LG. Improvement of hand function by noninvasive cortical stimulation in chronic stroke. *Brain*. 2005 Mar;128:490-9.
10. Floel A, Breitenstein C, Hummel F, **Celnik P**, Gingert C, Sawaki L, Knecht S, Cohen LG. Dopaminergic influences on formation of a motor memory. *Ann Neurol*, 2005. 58(1): p. 121-30.
11. Duque J, Hummel F, **Celnik P**, Murase N, Mazzocchio R, Cohen LG. Transcallosal inhibition in chronic subcortical stroke. *Neuroimage*, 2005 Dec;28(4):940-6. Epub 2005 Aug 9.
12. **Celnik P**, Stefan K, Duque J, Hummel F, Cohen LG. Encoding a motor memory in the elder by action observation. *Neuroimage*, 2006 Jan 15;29(2):677-84. Epub 2005 Aug 24.
13. Stefan K, Cohen LG, Duque J, Mazzocchio R, **Celnik P**, Sawaki L, Ungerleider L, Classen J. Formation of a motor memory by action observation. *J Neuroscience*, 2005;Oct 12;25(41):9339-46 (see Research Highlight comment in *Nature* 2005;437: 1210-1211).
14. Hummel F, Voller B, **Celnik P**, Floel A, Giraux P, Gerloff C, Cohen LG. Effects of brain polarization on reaction times and pinch force in chronic stroke. *BMC Neurosci*. 2006 Nov 3;7:73.
15. Webster BR, **Celnik PA**, Cohen LG. Noninvasive Brain Stimulation in Stroke Rehabilitation. *NeuroRx* 1 Oct 2006 3(4): 474. Review
16. Duque J, Murase N, **Celnik P**, Hummel F, Mazzocchio R, Olivier E, Cohen LG. Movement-related interhemispheric inhibition and handedness. *J Cogn Neurosci*. 2007 Feb;19(2):204-13.

17. **Celnik P**, Hummel F, Harris-Love M, Wolk R, Cohen LG. Somatosensory Stimulation Enhances Learning of Functional Tasks after Stroke. *Arch Phys Med Rehabil*. 2007 Nov;88(11):1369-76.
18. **Celnik P**, Webster B, Glasser D, Cohen LG. "Effects of Action Observation on Physical Training after Stroke. *Stroke*, 2008 Jun;39(6):1814-20. Epub 2008 Apr 10. Cited by Faculty of 1000 Medicine. Nick Ward: Faculty of 1000 Medicine, 10 May 2010 <http://f1000medicine.com/article/jrbh34mbqs0j8pz/id/3102956>
19. Makley M, English J, Drubach D, Kreuz A, **Celnik P**, Tarwater P. Prevalence of Sleep Disturbance in Closed Head Injury Patients on a Rehabilitation Unit. *Neurorehabil Neural Repair*, 2008 Jul-Aug;22(4):341-7.
20. Hummel F, **Celnik P**, Pascual-Leone A, Fregni F, Byblow WD, Butefisch C, Rothwell J, Cohen LG, Gerloff C. Controversy: "Noninvasive and invasive cortical stimulation show efficacy in treating stroke patients." *Brain Stimulation*. 2008 Oct;1(4):370-382
21. Reis J, Robertson EM, Krakauer JM, Rothwell J, Marshall L, Gerloff C, Wassermann EM, Pascual-Leone A, Hummel F, **Celnik PA**, Classen J, Floel A, Ziemann U, Paulus W, Siebner HR, Born J, Cohen LG. "Consensus: Can transcranial direct current stimulation and transcranial magnetic stimulation enhance motor learning and memory formation?" *Brain Stimulation*. 2008 Oct;1(4):363-369.
22. Stefan K, Classen J, **Celnik P**, Cohen LG. Concurrent action observation modulates practice-induced motor memory formation. *Eur J Neurosci*. 2008 Feb; 27(3): 730.
23. Makley MJ, Johnson-Greene LJ, Tarwater PM, Kreuz AJ, Spiro J, Rao V, **Celnik P**. Memory Return and Sleep Efficiency Following Moderate to Severe Closed Head Injury. *Neurorehabil Neural Repair*. 2009 May;23(4):320-6. Epub 2009 Jan 26.
24. Hummel F, Heise K, **Celnik P**, Floel A, Gerloff C, Cohen LG. "Facilitating skilled hand motor function in the elderly by anodal polarization of the primary motor cortex. *Neurobiol Aging*. 2010 Dec;31(12):2160-8. Feb 5. [Epub ahead of print]
25. **Celnik P**, Paik NJ, Vandermeeren Y, Dimyan M, Cohen LG. "Combined peripheral nerve stimulation and brain polarization on motor function after chronic stroke. *Stroke*. 2009 May;40(5):1764-71. Epub 3/12/09
26. Reis J, Cohen LG, Buch ER, Fritsch B, Zarahn E, **Celnik P\***, Krakauer JW. "Augmenting visuomotor skill acquisition and long term performance by noninvasive brain stimulation." *Proc Natl Acad Sci USA*. 2009 Jan 21. [Epub ahead of print]. \*Note: **Celnik** and Krakauer share the senior author role. Cited by the Faculty of 1000 Medicine. Heidi Johansen-Berg: Faculty of 1000 Medicine, 10 Mar 2009 <http://www.f1000medicine.com/article/id/1157452/evaluation>
27. Galea JM, **Celnik P**. Brain polarization enhances the formation and retention of motor memories. *J Neurophys*. 2009 Jul;102(1):294-301. Epub 2009 Apr 22.
28. Galea JM, Jayaram G, Ajagbe L, **Celnik P**. "Focal modulation of cerebellar excitability by polarity-specific non-invasive direct current stimulation. *J Neurosci*. 2009 Jul 15;29(28):9115-22.
29. Galea JM, Vazquez A, Pasricha N, Orban de Xivry JJ, **Celnik P**. Dissociating the Roles of the Cerebellum and Motor Cortex during Adaptive Learning: The Motor Cortex Retains What the Cerebellum Learns. *Cereb Cortex*. 2011 Aug;21(8):1761-70. Epub 2010 Dec 7. Cited by the Faculty of 1000 Medicine. Krakauer J: 2011. [F1000.com/7295956](http://F1000.com/7295956)
30. Jayaram G, Galea JM, Bastian AJ, **Celnik P**. Human locomotor adaptive learning is proportional to depression of cerebellar excitability. *Cereb Cortex*. 2011 Aug;21(8):1901-9. Epub 2011 Jan 14.
31. Orban de Xivry JJ, Marko MK, Pekny SE, Pastor D, Izawa J, **Celnik P**, Shadmehr R. Stimulation of the human motor cortex alters generalization patterns of motor learning. *J Neurosci*. 2011;May11;31(19):7102-10
32. Cantarero G, Galea JM, Ajagbe L, Salas R, Willis J, **Celnik P**. Disrupting the ventral premotor cortex interferes with the contribution of Action Observation to Use-Dependent Plasticity. *J Cogn Neurosci*. 2011 Dec;23(12):3757-66. Epub 2011 May 12.
33. Jayaram G, Tang B, Pallegadda R, Vasudevan EV, **Celnik P\***, Amy Bastian. Modulating Locomotor Adaptation with Cerebellar Stimulation. *J Neurophysiol*. 2012 Jun;107(11):2950-7. \*Note: **Celnik** and Bastian shared the senior author role.
34. Schlerf JE, Galea JM, Bastian AJ, **Celnik P**. Dynamic modulation of cerebellar excitability for abrupt, but not gradual, visuomotor adaptation. *J Neurosci*. 2012 Aug 22;32(34):11610-7.
35. Humbert IA, Christopherson H, Lokhande A, German R, Gonzalez-Fernandez M, **Celnik P**. Human Hyolaryngeal Movements Show Adaptive Motor Learning During Swallowing. *Dysphagia*. 2012 Aug 29. [Epub ahead of print]
36. Hoyer EH, **Celnik PA**. Understanding and enhancing motor recovery after stroke using transcranial magnetic stimulation. *Restor Neurol Neurosci*. 2011;29(6):395-409

37. Block HJ, **Celnik P**. Can cerebellar transcranial direct current stimulation become a valuable neurorehabilitation intervention? *Expert Rev Neurother*. 2012 Nov 12(11):1275-7. PMID: 23234389.
38. Cantarero G, Tang B, O'Malley R, Salas R, **Celnik P**. Motor learning interference is proportional to occlusion of LTP-like plasticity. *J Neurosci*. 2013 Mar 13;33(11):4634-41.
39. Block H, Bastian A, **Celnik P**. Virtual Lesion of Angular Gyrus Disrupts the Relationship between Visuoproprioceptive Weighting and Realignment. *J Cogn Neurosci*. 2013 Apr 25(4):636-48. Epub 2012 Dec 18. PMID: 23249345
40. Block H, **Celnik P**. Stimulating the Cerebellum Affects Visuomotor Adaptation but not Intermanual Transfer of Learning. *Cerebellum*. 2013 Dec;12(6):781-93.
41. Cantarero G, Lloyd A, **Celnik P**. Reversal of long-term potentiation-like plasticity processes after motor learning disrupts skill retention. *J Neurosci*. 2013 Jul 31;33(31):12862-9.
42. Grimaldi G, Argyropoulos GP, Boehringer A, **Celnik P**, Edwards MJ, Ferrucci R, Galea JM, Groiss SJ, Hiraoka K, Kassavetis P, Lesage E, Manto M, Miall RC, Priori A, Sadnicka A, Ugawa Y, Ziemann U. Non-invasive Cerebellar Stimulation-a Consensus Paper. *Cerebellum*. 2014 Feb;13(1):121-38.
43. Ilg W, Bastian AJ, Boesch S, Burciu RG, **Celnik P**, Claaßen J, Feil K, Kalla R, Miyai I, Nachbauer W, Schöls L, Strupp M, Synofzik M, Teufel J, Timmann D. Consensus Paper: Management of Degenerative Cerebellar Disorders. *Cerebellum*. 2013 Nov 13. [Epub ahead of print]
44. Salas RE, Galea JM, Gamaldo AA, Gamaldo CE, Allen RP, Smith MT, Cantarero G, **Celnik P**. "Increased Use-Dependent Plasticity in Chronic Insomnia" *Sleep* 2014;37 (3):535-544.
45. Yau JM, **Celnik P**, Hsiao SS, Desmond JE. "Feeling better: Separate pathways for targeted enhancement of spatial and temporal touch. *Psychol Sci*. 2014 Feb 1;25 (2):555-65.
46. Schlerf JE, Galea JM, Spampinato D, **Celnik P**. Laterality differences in cerebellar-motor cortex connectivity. *Cereb Cortex*. 2014 Jan 15. [Epub ahead of print].
47. Hardwick R, **Celnik P**. "Cerebellar direct current stimulation enhances motor learning in older adults." *Neurobiol Aging*. 2014 Oct;35 (10):2217-21. Epub 2014 Apr 2.
48. **Celnik P**. "Understanding and modulating motor learning with Cerebellar stimulation". *Cerebellum*. 2015 Apr;14(2):171-4.
49. Grimaldi G, Argyropoulos GP, Bastian A, Cortes M, Davis NJ, Edwards D, Ferrucci R, Fregni F, Galea J.M., Hamada M, Manto M, Miall RC, Morales-Quezada L, Pope PA, Priori A, Rothwell J, Tomlinson SP, and **Celnik P**. "Cerebellar Transcranial Direct Current Stimulation (ctDCS): A Novel Approach To Understanding Cerebellar Function In Health And Disease". *Neuroscientist*. 2014 Nov 18. [Epub ahead of print] Review.
50. Hone-Blanchet A, Salas RE, **Celnik P**, Kalloo A, Schar M, Puts NA, Harris AD, Barker PB, Fecteau S, Earley CJ, Allen RP, Edden RA. "Co-registration of magnetic resonance spectroscopy and transcranial magnetic stimulation." *J Neurosci Methods*. 2015 Mar 15;242:52-7
51. Cantarero G, Spampinato D, Reis J, Ajagbe L, Thompson T, Kulkarni K, **Celnik P**. "Cerebellar Direct Current Stimulation Enhances On-Line Motor Skill Acquisition through an Effect on Accuracy." *J Neurosci*. 2015 Feb 18;35(7):3285-90.
52. Statton M, **Celnik P** and Bastian AJ. "A Single Bout of Moderate Aerobic Exercise Improves Motor Skill Acquisition" *PLoS One*. 2015 Oct 27;10(10).
53. Lu H, Kobil T, Robertson C, Tong S, **Celnik P**, Pelled G. "Transcranial magnetic stimulation facilitates neurorehabilitation after pediatric traumatic brain injury." *Sci Rep*. 2015 Oct 6;5:14769.
54. Chae J, **Celnik PA**. "Stroke Rehabilitation." *Phys Med Rehabil Clin N Am*. 2015 Nov;26(4):xv-xvi.
55. Woods AJ, Antal A, Bikson M, Boggio PS, Brunoni AR, **Celnik P**, Cohen LG, Fregni F, Herrmann CS, Kappenman ES, Knotkova H, Liebetanz D, Miniussi C, Miranda PC, Paulus W, Priori A, Reato D, Stagg C, Wenderoth N, Nitsche MA. A technical guide to tDCS, and related non-invasive brain stimulation tools. *Clin Neurophysiol*. 2015 Nov 22. pii: S1388-2457(15)01088-3.
56. Wymbs N, Bastian AJ, and **Celnik, P**. "Motor skills are strengthened through reconsolidation". *Curr Biol*. 2016 Feb 8;26(3):338-43.
57. Hardwick RM, Rajan VA, Bastian AJ, Krakauer JW, **Celnik PA**. Motor Learning in Stroke: Trained Patients Are Not Equal to Untrained Patients With Less Impairment. *Neurorehabil Neural Repair*. 2016 Oct 27. [Epub ahead of print]

### **Inventions, Patents, Copyrights**

Pending

3/10 “Methods And Devices For Increasing Learning And Effects Of Training In Healthy Individuals And Patients After Brain Lesions Using Dc Stimulation And Apparatuses And Systems Related Thereto”

### **Extramural Sponsorship**

#### Current

- 7/10-6/16 Tracking and altering the time course of spontaneous biological recovery after stroke  
MCDONNELL FOUNDATION COLLABORATIVE PROPOSAL  
\$2,398,598.13  
PI: John W. Krakauer  
Role: Co-PI (Hopkins PI), this grant does not support PI salary
- 4/11-3/16 Mechanisms and Rehabilitation of Cerebellar Ataxia  
NCMRR, NICHD, NIH (5R01HD040289).  
\$116,516  
PI: Amy Bastian  
Role: Co-I, 8.5%
- 7/12-6/17 Understanding Motor Behavior In Stroke Patients  
NICHD, NIH (R01 HD073147)  
\$1,770,199  
PI: Pablo Celnik  
Role: PI; 20%
- 9/12-7/15 Glutamate, Hyper Arousal and Restless Legs Syndrome  
NINDS, NIH (R01NS075184).  
\$737,804  
PI: Richard Allen  
Role: Co-I, 2.5%
- 6/14-5/17 Rethinking the reaction time  
NSF (BCS-1358756)  
\$1,309,122  
PI: Krakauer  
Role: Co-I, 10%
- 7/14-6/19 Applying Motor Learning Principles To Swallowing Rehabilitation  
NIH, NIDC (R01DC014285)  
\$ 2,025,000  
PI: Humbert  
Role: Co-I, 5%
- 7/14-6/16 Insights into human learning and development from visual cortex plasticity in blindness  
Science of Learning Institute, Johns Hopkins University  
\$150,000  
PI: Bedny  
Role: Co-PI, no effort support
- 5/14-4/19 Research Training in Rehabilitation for Brain Injury and Neurological Disability  
NIH, NICHD (T32 HD007414)  
\$1,412,697.00  
PI: Johnston  
Role: Co-I, no effort support
- 8/15-7/20 The role of the Transcallosal Pathway in Neuroplasticity Following Nerve Injury  
R01; NINDS, NIH (2R01NS072171-06)

\$ 1,762,281  
 PI: Galit Pelled, PhD  
 Role: Co-I; 10%

7/15-6/20 Novel Strategies to Enhance Motor Function after Stroke  
 R01; NCMRR, NICHD, NIH (2R01HD053793)  
 \$ 2,665,760.17  
 PI: Pablo Celnik  
 Role: PI; 20%

7/15-6/20 Human Locomotor Plasticity In Health And Disease  
 R01; NCMRR, NICHD, NIH (2 R37-NS090610-10A1)  
 \$ 2,820,500  
 PI: Amy Bastian, PhD  
 Role: Co-I; 10%

04/16-02/21 Center for the Study of Aphasia Recovery (C-STAR)  
 P50; NIDCD, NIH (DC014664-01)  
 \$1,492,352  
 PI: Fridriksson  
 Role: Co-I; 5%

#### Pending

09/16 – 05/21 Behavioral and Neural Representations of Physical Effort Costs  
 R01; NICHD, NCMRR  
 PI: Vikram Chib  
 \$50,227  
 Role: Co-I; 5%

09/16 – 0821 Visual cortex plasticity in blindness: a window into flexibility of human cortex  
 R01; NEI  
 PI: Marina Bedny  
 \$400,000  
 Role: Co-I; 5%

#### Completed

7/03-6/06 Influence of Age on Use-Dependent Plasticity in Health and Disease  
 Association of Academic Physiatrists and NICHD, NIH  
 K12 Grant Recipient “Rehabilitation Medicine Scientist Training Program (RMSTP)” NIH  
 5K12HD001097  
 \$353,160.00  
 PI: John Whyte, MD, PhD.  
 Role: Hopkins PI, 75%

7/03-6/05 Influence of Age on Use-Dependent Plasticity in Health and Disease  
 Foundation for Physical Medicine and Rehabilitation  
 Total funds: \$10,000  
 Role: PI

7/06-6/07 Enhancing Motor Function in Chronic Stroke Patients by Action Observation  
 Johns Hopkins School of Medicine, Clinician Scientist Award  
 \$40,000  
 Role: PI

- 7/06-6/08 Use Dependent Plasticity In Frail Older Adults  
Dennis W. Jahnigen Career Development Scholars Award, Mid-Atlantic Affiliate, American Geriatric Society.  
\$150,000  
Role: PI; (Non-cost extension until June 2009)
- 7/06-6/08 Enhancing Motor Function in Stroke Patients by Action Observation  
American Heart Association, Beginning Grant-in-Aid; Award Number: 0665347U  
\$131,836  
Role: PI; (Non-cost extension until June 2009)
- 11/08-10/12 Cerebellar stimulation to improve learning  
Brain Science Institute, Johns Hopkins University  
\$200,000  
Role: PI
- 12/08-11/11 Non-invasive cerebellar stimulation to improve locomotion”  
NCMRR, NICHD, NIH.  
1R21HD060169-01  
\$275,000  
Role: PI
- 7/10-6/13 Motor Skill Learning in Autism  
NICHD, NIH (2 R01 NS048527-06A1)  
\$29,904  
PI: Mostofsky  
Role: Co-I
- 4/12-10/13 Improving situational awareness with non-invasive brain stimulation  
APL  
\$108,730.24  
Role: PI; (Celnik/ Vogelstein)
- 7/07-1/16 Novel Strategies to Enhance Motor Function after Stroke  
NCMRR, NICHD, NIH (1 R01 HD053793-01A1)  
\$ 2,665,760.17  
Role: PI

### **Research Program Building / Leadership**

- 7/06-present Director, Human Brain Physiology and Stimulation Laboratory, Department of PM&R. In this capacity, I have developed and supervise all research activities taking place in the lab as well as collaborations with other groups. The lab has been successful recruiting a number of excellent students, obtaining research grants and attracting interesting collaborators from within and outside of JHMI.
- 2/09-12/13 Organize and run the “Sensorimotor Research Day” at JHU. This 1-day event allows interaction of more than 10 different Hopkins Laboratories with participation of NIH scientists interested in sensorimotor research. More than 80 researchers and students have been participating in this annual meeting.
- 3/11-present Vice Chair for Research, Department of PMR. In my capacity, I am responsible to coordinate and organize all research-related activities taking place in the department. Together with Dr. Jeffrey Palmer, I have worked on developing and maintaining the departmental research mission, targeting four main areas: physiology of swallowing, motor control and stroke recovery, early rehabilitation interventions in the ICU, and psychological interventions to prevent secondary injury. Other responsibilities have been mentoring junior research faculty members, meeting with graduate and postdoctoral student education, overseeing the department’s research space, and advocating for

research. In addition, I monitor the dept. research budget and productivity. I assist other faculty members with grant and IRB submissions. I co-direct with Dr. Sam Mayer the Academic Medicine Experience for Medical Students (for the JHU site) sponsored by the Association of Academic Psychiatrists. I meet with each research faculty member annually as part of the annual evaluation process, and provide feedback to the faculty member and the dept. director.

- 2/12-5/12 Member of the working group: “Human-Machine Learning” that led to the development of the Institute for Learning. Selected by the JHU Provost Dr Lloyd Minor.
- 3/12-present T32 Co-Director. Pediatric and Adult Rehabilitation T32 co-sponsored by KKI and the JHSOM PMR Dept. This grant supports a postdoctoral training program aimed to provide physicians and PhD scientists with the skills necessary to conduct independent translational research to improve the lives of children and adults with brain injuries and neurological disabilities. The training program includes faculty from the School of Medicine, the Johns Hopkins Bloomberg School of Public Health as well as Kennedy Krieger Institute.
- 4/12-present Member of the Traumatic Brain Injury working group, Brain Science Institute, Johns Hopkins Medicine.
- 6/12-9/12 Member of the SOM Strategic Research Planning: Early T1 Translation Approaches
- 2014 - present Member of the Johns Hopkins Medicine Research Council.

## EDUCATIONAL ACTIVITIES

### Educational Publications

#### Editorials:

1. **Celnik P**, Hillis AE. Reconnecting the Dots after Stroke. *Ann of Neurol.* 2009 Nov;66(5):570-1.
2. **Celnik P**, Birnbaumer N. How Much Will I Recover Doctor? Some Help To An Ever-Elusive Answer. *Neurology.* 2014 Jan 21;82(3):192-3.

#### Book Chapters, Monographs:

1. Cohen LG, Chen R, **Celnik P**. Functional relevance of cortical plasticity. In: **“Research and Perspectives in Neuroscience.”** Grafman J (ed). Springer-Verlag. 1999.
2. **Celnik P**. Traumatic Brain Injury and Spinal Cord Injury. In: **“Medicina.”** Mautner B (ed). Editores de la Fundacion Favalaro, Buenos Aires, Argentina. 1998 [Spanish]
3. **Celnik P**. Neurorehabilitacion. In: **“Neurologia.”** Micheli F, Nogués M, Asconapé J, Fernández Pardal M, Biller J (eds). Panamericana. 2001. [Spanish]
4. **Celnik P**, Cohen LG. Functional relevance of cortical plasticity. In **“Plasticity in the human nervous system: studies with transcranial magnetic stimulation.”** Boniface S, U Ziemann (eds). Cambridge University Press. Cambridge. 2003
5. Fridman E, **Celnik P**, Cohen LG. Visual cortex involvement in performance of somatosensory tasks. In: **“Handbook of Multisensory Integration.”** Stein B (ed). MIT Press. 2003
6. **Celnik P**, Makley M, Fridman E, Cohen LG. Reorganization in the central nervous system and neural prostheses. In: **“Neuroprosthetics: theory and practice.”** (Series in Bioengineering and Biomedical Engineering). Horsh K, Dhillon G (ed). World Scientific Publishing Co. 2003
7. **Celnik P**, Cohen LG. Cortical Plasticity and Motor Disorders. In **“Higher-Order Motor Disorders From neuroanatomy and neurobiology to clinical neurology.”** Freund J, Hallett M, Leiguarda R (eds). Oxford University Press. 2005
8. Harvey R, Elliot R, Yu D, **Celnik P**. Stroke Rehabilitation. In **“Physical Medicine and Rehabilitation”** 4<sup>th</sup> Ed. Braddom R (ed). Saunders, Elsevier. 2010
9. Hummel F, **Celnik P**. Brain Stimulation. In: **“Textbook on Neural Repair and Rehabilitation Vol 2.”** 2<sup>nd</sup> Ed. Selzer M, Clarke S, Cohen LG, Kwakkel G, Miller R (eds). Cambridge Univ Press. 2013
10. Gabriela C and **Celnik P**. Applications of TMS to Study Brain Connectivity. In **“Brain Stimulation:**

**Methodologies and Interventions”** Irving Reti (Ed). John Wiley & Sons, Inc. 2015.

## Teaching Experience

### Classroom instruction:

- 1987-1989 Human Anatomy. Teaching Assistant, lead bench practical work 3 times per week, annual course. School of Medicine, University of Buenos Aires, Argentina.
- 1988-1994 Neurophysiology. Teaching Assistant, lead weekly bench practical work and teach seminars. Two trimesters per year. School of Medicine, University of Buenos Aires, Argentina
- 1997-1999 Neurology Resident Didactic Series, lecturer, “Neurological Rehabilitation.” “Traumatic Brain Injury.” “Neuroplasticity and Recovery.” given yearly to neurology house staff. FLENI Institute, Buenos Aires, Argentina.
- 2003-present Physical Medicine and Rehabilitation Resident Didactic Series, lecturer, “Radiculopathies.” “Stroke rehabilitation.” “Neurodegenerative Syndromes.” “Electromyography.” “Traumatic Brain injury.” given yearly to PMR house staff, Johns Hopkins.
- 2007-present Johns Hopkins Neuroscience Graduate Program, lecturer, “Neuroscience and Cognition II” (ME440.812), one class per year discussing “Methods to investigate human brain plasticity and Non-invasive brain stimulation.” given to neuroscience graduate students, Johns Hopkins.
- 2008 Physical Medicine and Rehabilitation Resident Didactic Series, Module Director, “Neuromuscular Diseases.” given to PMR house staff and rotating medical students, Johns Hopkins.
- 2009-present Neurology Resident Didactic Series, Lecturer, “Stroke rehabilitation.” “Non-invasive Brain Stimulation.” given annually to neurology housestaff and rotating medical students, Johns Hopkins.
- 2011-present Clinical Neurophysiology Fellowship Didactic Series, Lecturer, “Non-invasive Brain Stimulation.” given annually to neurophysiology fellows, Johns Hopkins.
- 2012-present Stroke Neurology Fellowship Didactic Series, Lecturer, “Stroke rehabilitation.” given annually to stroke fellows, Johns Hopkins.
- 2012-present BME Undergraduate Program, Lecturer, “Introduction to Rehabilitation Engineering.” give a talk annually on “Transcranial Magnetic Stimulation and Direct Current Stimulation: Studies of Motor Function in Healthy and Stroke patients” to BME undergraduates, Johns Hopkins.
- 2012 Johns Hopkins Medical School, Lecturer, “Regenerative Medicine Course.” responsible for the “Recovery of motor function after stroke” lecture and discussion group to medical students, Johns Hopkins.
- 2013 Physical Medicine and Rehabilitation Resident Didactic Series, Module Director, “Traumatic Brain Injury.” given to PM&R housestaff and rotating medical students, Johns Hopkins.
- 2013-present Johns Hopkins Neuroscience Undergrad program, Lecturer, “Cerebellum course.” give a lecture annually on “Non-invasive methodologies to study the cerebellum” to neuroscience undergraduates, Johns Hopkins.

### Clinical instruction

- 1993-1994 Neurology, Instructor for the medical students clerkship, 1 month each year, Department of Neurology, French Hospital, University of Buenos Aires, Argentina.
- 1997-1999 Neurology resident rounds, Instructor/Preceptor, 4 times a year for 2 weeks. Neurology Department, FLENI, Buenos Aires, Argentina.
- 2003-present Mentor undergraduate students “Medical Shadow Program.” Preceptor, given to Hopkins undergraduates in the premed program one to two semesters per year, Johns Hopkins.
- 2004-present Outpatient Neurorehabilitation Program, Preceptor, directed to Physical Medicine and Rehabilitation and Neurology residents, medical students and stroke and pain fellows rotating in the PM&R Department, Johns Hopkins.
- 2004-2010 Outpatient EMG clinic, Preceptor, directed to Physical Medicine and Rehabilitation residents and medical students rotating in the PM&R Department, Good Samaritan Hospital.
- 2010-present Outpatient EMG clinic, Preceptor, directed to Physical Medicine and Rehabilitation residents and medical students rotating in the PM&R and Neurology Departments, JHBMC.
- 2011-present Johns Hopkins Medical School, Preceptor, “Chronic Disease Prevention” course, given to medical students rotating in the Outpatient Neurorehabilitation Program, Johns Hopkins.

### CME instruction

Role: Lecturer

- 3/03 Continue Education Seminars, Baltimore Adult Communication Disorders Interest Group “Dysphagia and Neuroplasticity.” Johns Hopkins.
- 4/04 Grand Round, Medical Neurology Branch, NINDS, NIH, “Influence of Somatosensory Input in Human Neurorehabilitation.” Speaker, Bethesda, Maryland.
- 9/04 Grand Round, National Rehabilitation Hospital “A Forgotten Strategy? Somatosensory Input can Modulate Human Neurorehabilitation.” Speaker, Washington DC.
- 3/06 Annual Meeting of the Association of Academic Physiatrist, Course C: New Technologies and their Application to Rehabilitation Research, “Transcranial Magnetic Stimulation and Stroke Recovery.” Invited Speaker, San Juan Puerto Rico.
- 4/07 Association of Academic Physiatrist, RMSTP, “Scientific Autobiography.” Invited speaker, San Juan, Puerto Rico.
- 2/08 Association of Academic Physiatrist. “Grant writing skills.” Invited panel speaker, Anaheim, CA.
- 4/08 Grand Rounds, Spaulding Rehabilitation Hospital, Harvard, “Can Action Observation be used as a Strategy to Enhance beneficial Effects of Motor Training in Neurorehabilitation after Stroke?.” Speaker, Boston, MA.
- 11/08 Annual Meeting American Academy of Physical Medicine and Rehabilitation, “Transcranial Magnetic Stimulation to Understand and Enhance Motor Recovery after Stroke.” Invited Course Speaker, San Diego, Ca.
- 2/09 Grand Rounds, Department of Neurology, Johns Hopkins University. “Non-Invasive Brain Stimulation to Enhance Motor Function after Stroke.” Speaker, Baltimore, MD.
- 2/09 Research council presentation, Association of Academic Physiatrists, “Lessons learned in the course to my first R01” Speaker, Colorado Springs, CO.
- 5/09 NCCU Lecture series, Department of Neurology, Neurosurgery and Anesthesia, “Non-Invasive Stimulation to Enhance Motor Function in Healthy and after Stroke.” Johns Hopkins, Baltimore, MD.
- 7/09 Grand Rounds, Department of Physical Medicine and Rehabilitation, Pittsburgh University. “Understanding and Enhancing Recovery of Motor Function after Stroke.” Speaker, Pittsburgh, PA.
- 12/09 Grand Rounds, Department of Physical Medicine and Rehabilitation, Columbia University. “Modulation of Cerebellar Function with Non-Invasive Stimulation.” Speaker, Manhattan, NY.
- 3/10 International Brain Injury Association’s 8th World Congress on Brain Injury, “Applications of TMS & tDCS to Motor Performance.” Invited Speaker, Washington, DC.
- 3/10 6<sup>th</sup> World Congress in Neurological Rehabilitation. “Understanding and Augmenting Motor Learning Processes using Neurorehabilitation Strategies.” Invited Speaker, Vienna, Austria.
- 7/10 Grand Rounds, Department of Medicine, Division of Geriatric Medicine, “Augmenting Motor Function in Health and Disease Using Non-invasive Brain Stimulation.” Speaker, Johns Hopkins, Baltimore, MD.
- 9/10 Scientific Updates in Exercise, Robotics and Neuro-Rehabilitation 2010, “Brain stimulation to modulate motor Pablo Celnik Processes.” Invited Speaker, The VA Capitol Health Care Network, University of Maryland; Baltimore, MD.
- 10/10 Joint meeting American Congress Rehabilitation Medicine and American Society of Neurological Rehabilitation, “Understanding and Augmenting Motor Learning Processes for the Benefit of Neurological Rehabilitation.” Keynote Speaker, Montreal, Canada.
- 11/10 Theodore M. Cole Research Lecture, Dept. of PMR, “Augmenting Motor Function in Stroke Patients and Healthy Individuals.” Invited speaker, University of Michigan, Ann Arbor, Michigan.
- 12/10 Grand Rounds, Burke Rehabilitation Institute, Cornell University “Augmenting Motor Learning Processes for the Benefit of Neurological Rehabilitation.” Speaker, White Plains, NY.
- 12/10 Neural and Behavioral Science Seminar, State University of New York, SUNY Downstate. “Using Transcranial Magnetic Stimulation and Direct Brain Polarization to Understand and Improve Motor Behavior.” Speaker, Brooklyn, NY
- 4/11 Association of Academic Physiatrist, Course B. “Enhancing Motor Learning with Non-Invasive Brain Stimulation.” Invited Speaker, Chandler, AZ.
- 5/11 Johns Hopkins Traumatic Brain Injury A National Conference: From Impact to Recovery, Invited Speaker, “Non-invasive Brain Stimulation to Augment Motor Function.” Johns Hopkins, Baltimore
- 6/11 Johns Hopkins Spinal Cord Injury 2nd National Research Symposia, “Non-invasive Brain Stimulation to Enhance Motor Function.” Keynote Speaker, Johns Hopkins, Baltimore, MD.

- 9/11 German Neurological Society Meeting, “Action Observation Therapy as a Neurorehabilitation Strategy.” Invited Speaker, Wiesbaden, Germany.
- 9/11 German Neurological Society Meeting, Invited Speaker, “Cerebellar Lesions and Response to Split-belt Treadmill Training” Invited Speaker, Wiesbaden, Germany.
- 11/11 American Academy of Physical Medicine and Rehabilitation, Session 222, “Modulation of Motor Function Using Non-Invasive Brain Stimulation.” Invited Speaker, Orlando, FL.
- 11/11 Society for Neuroscience, American Society for Neurorehabilitation satellite, “Human Cortical Physiology and Neurorehabilitation (Back to Mechanisms).” Keynote Speaker, Washington DC.
- 11/11 Society for Neuroscience, Methods for Studying Human Cerebellar Structure and Function satellite, “Non-invasive Cerebellar Stimulation (tDCS): Background, Methods and Applications.” Invited Speaker, Washington DC.
- 2/12 University of Alabama, PMR Dept. Grand Rounds. “Understanding and enhancing motor behavior in healthy individuals and stroke patients” Speaker, Birmingham, AL.
- 2/12 Association for Academic Physiatrist. Course B, “TMS & tDCS: Non-invasive Brain Stimulation to Understand Brain Function and Recovery” Speaker, Las Vegas, Nevada.
- 2/12 Association for Academic Physiatrist. RMSTP, “Preparing a K award Application.” Speaker, Las Vegas, Nevada.
- 2/12 Association for Academic Physiatrist. RMSTP, “Pathways for research success.” Speaker, Las Vegas, Nevada.
- 2/12 Association for Academic Physiatrist, RMSTP, “Mentors.” Speaker, Las Vegas, Nevada.
- 10/12 University of Michigan. Neuroscience Dept. Lecture Series. “Using Non-Invasive Brain Stimulation to Study Cerebellar Contributions to Motor Learning.” Invited Speaker, Ann Arbor, Michigan.
- 11/12 Brain Night, Brain Science Institute, Johns Hopkins Medicine, “Can a 9v Battery Help You Behave?” Speaker, Johns Hopkins, Baltimore, MD.
- 2/13 Bodian Seminar, Krieger Mind Brain Institute, Dept of Neuroscience, Johns Hopkins Medicine. “Neurophysiological mechanisms underlying human motor learning retention and interference” Speaker, Johns Hopkins, Baltimore, MD.
- 3/13 Association for Academic Physiatrist. RMSTP, “Preparing a K award Application.” Speaker, New Orleans, Louisiana.
- 3/13 Association for Academic Physiatrist. RMSTP, “Pathways for research success” Speaker, New Orleans, Louisiana.
- 3/13 Third Annual Johns Hopkins Traumatic Brain Injury Meeting, A National Conference. “Biomarkers in mild Traumatic Brain Injury” Moderator, Johns Hopkins, Baltimore, MD.
- 1/14 47<sup>th</sup> Winter Brain Conference in Brain Research “Spike timing-dependent plasticity in cortical learning” Speaker.
- 2/14 Association for Academic Physiatrist. RMSTP, “Preparing a K award Application.” Speaker, Nashville, Tennessee.
- 2/14 Association for Academic Physiatrist. RMSTP, “Responsible conduct in research.” Speaker, Nashville, Tennessee.
- 3/14 24th Annual Practical Update in Outpatient Neurology “Novel Interventions in Stroke Rehabilitation.” Speaker, Johns Hopkins.
- 3/14 30th International Congress on Clinical Neurophysiology of the IFCN “Adaptive, maladaptive and epiphenomenal functional brain changes in human stroke” Speaker, Berlin, Germany.
- 3/15 Association for Academic Physiatrist. RMSTP, “Preparing a K award Application.” Speaker, San Antonio, Texas.
- 3/15 Association for Academic Physiatrist. RMSTP, “Responsible conduct in research.” Speaker, San Antonio, Texas.
- Workshops/seminars: Course Director
- 6/07 4th World Congress of the International Society Physical Rehabilitation Medicine, Seoul, Korea. “Novel Stimulation Techniques To Enhance Motor Recovery After Stroke.”
- 9/07 2nd Pan-American Congress of Neurorehabilitation, Buenos Aires, Argentina. “Emergent Treatments to Enhance Motor Function after Stroke”
- 1/09 42<sup>nd</sup> Annual Winter Conference on Brain Research, Colorado, USA. “Novel Strategies for CNS Regeneration and Modern Rehabilitation.”

- 4/10 Neural control of movement annual meeting, Naples, Florida. “Using TMS to study connectivity in the context of motor behaviour.”
- 5/11 Johns Hopkins Traumatic Brain Injury A National Conference: From Impact to Recovery. Organizational committee.
- 1/12 45<sup>th</sup> Annual Winter Conference on Brain Research, Utah. “Using non-invasive brain stimulation to study human motor learning.”
- 10/13 American Academy of Physical Medicine and Rehabilitation, Workshop director W22, “Using Noninvasive Brain Stimulation Techniques: A Hands-On Experience.”
- 7/14 Sixth International Congress of the Society for Research on the Cerebellum, session chair, “Cellular, Synaptic and Physiological Mechanisms”
- 9/14 Johns Hopkins Hospital, symposium organizer and speaker, “Motor Control and Rehabilitation: A Collaborative Johns Hopkins University - University College London Meeting”

## Mentoring

### Graduate students:

- 2008 – 2013 Gabriela Cantarero, PhD, graduate student, Dept. of Neuroscience, Post-doctoral fellow (May to August 2013) Dept. of PMR, Johns Hopkins. Recipient of the “2008 William and Mary Drescher Award for Graduate Medical Research.” This award is to support biomedical research by promising young scientists. Recipient of NRSA (F31) by the NINDS, NIH. Currently postdoctoral fellow at Walter Reed Army Institute of Research.
- 2008 – 2013 Gowri Jayaram, PhD, graduate student, Dept. of Biomedical engineering. Recipient of F31 award (NRSA), NINDS, NIH. Currently working as an associate in the Biomechanics Practice of Exponent.
- 2009 – 2009 Alejandro Vasquez, M.S., BME graduate student. Currently, graduate student at Dr Amy Bastian’s lab, and I serve as co-mentor.
- 2013 – 2014 Vikram Rajan, master student, Biomedical Engineering Department, Johns Hopkins. First author of paper currently being prepared for submission.
- 2015 - 2016 Claudia Amman, PhD candidate. Claudia is a visiting student from Sevilla, Spain. She has done research investigating the mechanisms of transcranial direct current stimulation in the eye-blink conditioning rabbit model. Currently, we are translating some of her research studies to human subjects.
- 2011 – present Daniel Spampinato, PhD candidate, Biomedical Engineering Department, Johns Hopkins. First author of abstracts presented in the Neural control of movement meeting 2012 and SFN 2012, 2013. Recipient of NRSA (F31) by NICHD (NCMRR), NIH.

### Undergraduate, medical, and pre-medical students:

- 2004 - 2004 Rebecca Wolk, BA, pre-medical student, Brown University. Author in article: Celnik P, Hummel F, Harris-Love M, Wolk R, Cohen LG. Arch Phys Med Rehabil. 2007 Nov;88(11):1369-76.
- 2004 - 2005 Jihye Chang, BA, undergraduate pre-medical student, enrolled in the clinical doctor tutorial program. Currently at Albert Einstein Medical Institution.
- 2005 Thomas Reynolds, BA, medical student at the University of Witten/Herdecke, Germany. Project Title: “Action Observation as strategy to enhance motor memory formation after stroke.”
- 2005 Martin Gaudinski, BA, undergraduate pre-medical student, enrolled in the clinical doctor tutorial program.
- 2005 Aaron Baughman, MS., biomedical engineering student. Project Title: “Formation of motor memory during motor skill learning.” Currently is a senior data analytics and software engineer at IBM.
- 2005 - 2006 Brian Webster, BA, medical student at UCSD, sponsored by the Howard Hughes Medical Institution. First author abstract presented in the Human Brain Mapping meeting 2006. First author review paper. Article: Webster B, Celnik P, Cohen LG. Author in article: Celnik P., Webster B, Davis Glasser, Cohen LG. Stroke 2008 Jun;39(6):1814-20. Epub 2008 Apr 10. Currently, deceased.
- 2005 - 2006 Davis Glasser, BA, undergraduate student, New York Rochester University. Author in article: Celnik P., Webster B, Davis Glasser, Cohen LG. Stroke 2008 Jun;39(6):1814-20. Epub 2008 Apr 10. Currently a graduate student at the University of Rochester in the Department of Brain and Cognitive Sciences and the Center for Visual Science.
- 2006 - 2007 Mitra Hashimati, undergraduate neuroscience program and premedical student. Project Title: “Modulation of Cerebellar Activity by Non-invasive Stimulation”

- 2007 Essence Worthy, neuroscience undergraduate and premedical student. Project Title: "Use Dependent Plasticity In Frail Older Adults"
- 2008 Kopal Shama Kulkarni, M.A. medical student, recipient of the 2008 "Rehabilitation Research Experience for Medical Students Award (RREMS)" from the Association of Academic Physiatrists. First author abstract and winner of the "Best Paper Award by Medical Student" presented at Association of Academic Physiatrist 2009. Currently a resident in Hopkins Radiology Dept
- 2008 Smita Mohan, biomedical engineer undergraduate. Project Title: "Enhancing Prism Adaptation by tDCS." Currently a graduate student at UC Davis.
- 2009 - 2010 Jeffrey Willis, PhD. Medical Student and postdoctoral fellow. Recipient of the 2009 "Rehabilitation Research Experience for Medical Students Award (RREMS)" from the Association of Academic Physiatrists. First author abstract presented at Association of Academic Physiatrist 2009. Currently is Ophthalmology resident at UCLA.
- 2010 - 2011 Byron Tang, BME undergraduate and research assistant. Co-author in two papers: (1) "Motor learning interference is proportional to occlusion of LTP-like plasticity." J Neuroscience 2013. (2) "Modulating locomotor adaptation with cerebellar stimulation." J. Neurophysiology 2012. Currently working as a consultant at BTS, San Francisco Bay Area, Management Consulting.
- 2010-2012 Rebecca O'Malley, neuroscience undergraduate student. Co-author in the paper: "Motor learning interference is proportional to occlusion of LTP-like plasticity." J Neuroscience 2013. Currently is a Senior Strategy Consultant, Healthcare Consulting Firm, Washington DC.
- 2011-2012 Neel Pasricha, neuroscience undergraduate and research assistant. Co-author on a paper "Dissociating the roles of the cerebellum and motor cortex during adaptive learning: the motor cortex retains what the cerebellum learns." Cerebral Cortex 2011. With this paper he received First Place: 2011 Sigma Xi Northeastern Research Symposium, People's Choice Award: 2011 Sigma Xi Northeastern Research Symposium, and a Neuroscience Travel Grant: \$1,000. Currently: medical student at Duke University. Currently completing medical school at Duke University.
- 2012 Ashley Lloyd, neuroscience undergraduate and premedical student. Co-author in the paper: "Reversal of long-term potentiation-like plasticity processes after motor learning disrupts skill retention." J Neuroscience 2013. Currently is a research assistant at Dr Akira Sawa's lab, Department of Psychiatry, Johns Hopkins Medicine. Applying to medical school.
- 2013-2015 Stefano Castagnola, neuroscience undergraduate student. Co-author in abstract submitted to Society for Neuroscience annual meeting 2014. Currently assisting with manuscript in preparation.
- 2015 Maxwell Silverstein, high school student. Co-author in abstract submitted to Society for Neuroscience annual meeting 2015. Currently assisting with manuscript in preparation.

Post-doctoral fellows:

- 2008 - 2010 Joseph Galea, PhD, post-doctoral fellow. Author in 7 papers, first author of 3 articles in J. of Neurophysiology, J of Neuroscience and Cereb Cortex. Winner of the "Klein-Vogelbach prize for the research of human movement" in 2012 with the article: "Dissociating the roles of the cerebellum and motor cortex during adaptive learning: the motor cortex retains what the cerebellum learns." Cerebral Cortex 2011. Currently: Independent Research Fellow. School of Psychology, University of Birmingham, Birmingham, UK.
- 2010 - 2012 Johns Schlerf, PhD, post-doctoral fellow. First author of 2 papers in J Neuroscience 2012 and Abstracts submitted to Neural Control of Movement and Society for Neuroscience annual meetings 2011, 2012. Currently works in EBay advertisement performing Machine Learning Algorithms.
- 2010 - 2013 Hannah Block, PhD, post-doctoral fellow. First author in 3 papers in J Cognitive Neuroscience, Cerebellum and Expert Rev Neurotherapeutics. Currently: Assistant Professor in the Physical Therapy Dept. Indiana University
- 2010 - 2014 Jeffrey Yau, PhD, post-doctoral fellow, co-mentor with Dr. John Desmond, Neurology Dept. Received F32 finding. First author of paper "Dissociable crossmodal recruitment of visual and auditory cortex for tactile perception." Hired as Assistant Professor in the Department of Neuroscience, Baylor College of Medicine.
- 2012 - 2014 Robert Hardwick, PhD, post-doctoral fellow. Robert has been studying the role of tDCS as a strategy to enhance skill learning in stroke patients. He has presented his results in the sensorimotor research day at Hopkins. He is also a first author in a manuscript in Neurobiology of Aging demonstrating that cerebellar tDCS augments learning in older subjects making their abilities similar to younger adults.

- Robert is now a post-doctoral fellow in Dr Krakauer Lab at Johns Hopkins.
- 2013 - 2014 Panagiotis Kassavetis, MD, graduate student, research rotation as part of his PhD training at the University College of London. Advisors: Professors Mark Edwards, MD and John Rothwell, PhD. Panagiotis obtained funding via the Wellcome Trust foundation to support his experience in my lab, project: "Learning under fatigue." Dr Kassavetis is now a neurology resident in Boston University, Massachusetts.
- 2014 - 2015 Lei Lew, PhD, post-doctoral fellow in collaboration with Dr. Leo G Cohen, NIDS, NIH. She spent 6 months rotation learning non-invasive brain stimulation techniques in the context of motor learning studies. Currently, Lei is preparing a manuscript submission from work performed in my lab. Dr Lew is now an Assistant Professor of Occupational Therapy at USC, California.
- 2013 - 2016 Nicholas Wymbs, PhD, post-doctoral fellow. Currently, he is studying the role of different forms of motor practice to augment retention of motor memories. First author of publication in Current Biology 2016.
- 2014 - present Shintaro Uehara, PhD, post-doctoral fellow. Currently, he is studying the role of the primary motor cortex when learning a motor task that relies on adaptation mechanisms.
- 2014 - present Firas Mawase, PhD, post-doctoral fellow. Firas completed his PhD in Ben Gurion, Israel with Dr Amir Karniel. Currently, he is investigating the role of reinforcement on use dependent motor learning mechanisms. He is preparing his first manuscript as first author from the lab.
- 2015 - present Meret Branscheidt, MD, post-doctoral fellow. Meret is a German physician, training in neurology in Switzerland. Currently, she is investigating whether patients after stroke express increased levels of neural plasticity that can potentially impact positively the response to rehabilitation interventions.
- 2016 - present Rajani Sebastian, PhD, post-doctoral fellow. Raj is an Indian descent SLP. She is currently funded by a K99/R00 to study the role of cerebellar stimulation as a potential treatment for patients with aphasia. I am the co-primary mentor of her award together with Dr. Argye Hillis.
- 2016 - present Kendra Cherry-Allen, PhD, post-doctoral fellow. Kendra work focuses on combining the right learning mechanisms to maximize motor learning in patients with stroke.

#### Junior Faculty:

- 2007 - 2012 Rachel Salas, MD, first Sleep Neurology fellow and since 2008 assistant professor of Neurology. Recipient of NIH Minority Supplement and JHU Mosaic Award. First author, article in Sleep journal. Currently, assistant professor of Neurology, JHU.
- 2008 - present Ianessa Humbert, SLP, PhD, assistant professor of PMR. Awarded K23 NICDC, NIH under my mentorship. Recipient of "Dysphagia Research Society New Investigator Award." Recipient of the "Early Career Contributions in Research" award 2010 from the American Speech Language Hearing Association. First author of paper in Dysphagia. An assistant professor of PM&R at JHU, she is currently being reviewed to be promoted to the rank of associate professor. She has recently received her first R01 where I am a co-investigator.
- 2010 - 2012 Erik Hoyer, MD, instructor of PMR. Winner of best presentation and first author in Abstracts submitted to the Association Academic Physiatrist and Society for Neuroscience annual meetings 2011 and 2012. First author in review paper, in the Journal of Restorative Neurology and Neuroscience 2012. Currently assistant professor in the PMR, Dept. Johns Hopkins.
- 2013 - present Amir Kheradmand, MD, assistant professor of Neurology. Amir was recently awarded a K23 where I am his secondary mentor. His primary mentor is Dr David Zee. I am responsible to train Amir on neurophysiology and TMS techniques.
- 2015 - present Lei Lew, PhD. Lei is an Assistant Professor of Occupational Therapy at USC, California. I am providing scientific and academic mentoring to help her develop into an independent PI and clinician scientists with focus on neurorehabilitation.
- 2015 - present Gabriela Cantarero, PhD. Gabriela is a Captain in the US Army working as a scientist at WRAIR with an adjunct Assistant Professor appointment in the Dept. of PMR at Hopkins. Gabriela's interests are to understand predictors and the mechanisms of recovery following mild traumatic brain injury. I am providing mentoring in her research area as well as on overall professional academic development. Her work, performed in its majority at Johns Hopkins, is funded through a CRADA agreement between the US Army and Johns Hopkins.
- 2016 - present Nicholas Puts, PhD. Nick is an Assistant Professor in the Radiology Dept. He is currently funded by a K99/R00 to study GABAergic mechanisms in children with Autism Spectrum Disorder. I am primary

mentor of his award.

#### Thesis committees

- 2009 Julia Choi, PhD. BME “Neural Control of Locomotor Adaptation In Humans” Role: Thesis committee member.
- 9/10 Natalie Trzcinski, Neuroscience PhD Candidate: Mechanisms and Perceptual Consequences of Somatosensory Plasticity. Role: Co-advisor.
- 2011 Laura Malone, PhD. BME. “Spatial And Temporal Coordination In Locomotor Learning” Role: Thesis committee member.
- 6/11 Danny Spampinato, BME PhD candidate. “Understanding the Physiological Role of the Cerebellum on Human Motor Learning” Role: primary advisor.
- 2012 Nassir Bhanpurri, PhD. BME “Cerebellar Internal Models Contribute to Action and Perception” Role: Thesis committee member.
- 2012 Aaron Wang, PhD. BME. “Motor Learning In The Saccadic System: The Importance Of Prediction In Maintaining Movement Accuracy” Role: Thesis committee member.
- 2013 Gabriela Cantarero, PhD. Neuroscience, “Neurophysiological Mechanisms Underlying Retention of Motor Learning” Role: primary advisor.
- 2013 Gowri Jayaram, PhD. BME "Understanding and enhancing locomotor adaptation using transcranial stimulation" Role: Co-advisor.
- 2014 Vikram Rajan, BME Masters: “Intralimb transfer of skill learning.” Role: primary advisor
- 2015 Alex Vaquez, BME PhD candidate. “Cerebellar Learning of Action and Perception in Walking” Role: co-advisor.
- 5/13 Heidi Weeks, BME PhD candidate. “Movement and Sensation in Cerebellar Ataxia” Role: Co-advisor.
- 7/09 Natalie Trzcinski, Neuroscience PhD candidate. Mechanisms and Perceptual Consequences of Somatosensory Plasticity (F31-NS073309). Role: Thesis committee member.

#### Training grant participation

- 7/1/08 - 6/30/10 “Novel strategies to enhance motor function after stroke”  
Supplement R01 HD053793  
NICHD/NIH  
Role PI: Pablo Celnik, for Rachel Salas; I am the PI of the parent grant and primary mentor of Dr Rachel Salas.
- 5/6/09 – 12/1/14 “Effects of aging on swallowing physiology with transient cortical disruption”  
5K23DC010776  
NIH/NICDC  
PI: Humbert, Ianessa  
Role: I am the primary mentor in this K award. Beyond the standard mentor activities, I am also responsible to train Dr Humbert on non-invasive brain stimulation techniques and issues of motor control.
- 7/1/10 - 11/1/12 “Improving bimanual tasks with non-invasive brain stimulation”  
K12  
AAP-NICHD/NIH  
PI: Erik Hoyer  
Role: I was a co-mentor of this award.
- 7/1/11 – 1/15/14 “Crossmodal recruitment of visual and auditory cortex for tactile perception”  
F32 HD073371  
NINDS/NIH  
PI: Jeffrey Yau  
Role: I was a co-mentor of this award.
- 4/8/12 - 5/15/13 “Behavioral and Neurophysiologic Mechanisms Underlying Interference and

- Transfer of Learning”  
F31 NS073386  
NINDS/NIH  
PI: Gabriela Cantarero  
Role: I was the primary mentor of this NRSA award.
- 10/10/13 - present “Understanding the physiological role of the cerebellum on human motor learning  
F31 HD078130  
NICHD/NIH  
PI: Danny Spampinato  
Role: I am the primary mentor of this NRSA award.
- 2/7/14 – 5/1/2016 “Movement and Sensation in Cerebellar Ataxia”  
F31NS086399  
NINDS/NIH  
PI: Heidi Weeks  
Role: I am a co-mentor on this award
- 07/15/14 - 06/30/19 TMS of the Supramarginal Gyrus: A Window To Spatial Orientation  
NIH, NIDCD (K23)  
PI: Amir Kherardmand, MD.  
Role: Secondary mentor, no effort
- 7/1/16- present A multimodal investigation of inhibitory dysfunction in children with Autism  
Spectrum Disorder  
NIH, NIMH K99/R00  
\$ 930,000  
PI: Nick Puts, PhD.  
Role: Primary mentor, no effort
- 7/1/16- present Cerebellar Transcranial Direct Current Stimulation to Augment Chronic Aphasia Treatment  
NIH, NIDCD K99/R00  
\$ 930,000  
PI: Rajani Sebastian, PhD.  
Role: Co-Primary mentor, no effort

### **Educational Program Building/Leadership**

- 2008 Module Director, “Neuromuscular Diseases.” Physical Medicine and Rehabilitation Resident Didactic Series. In this capacity, I help organize and lead a month of weekly lectures on this topic given to PMR housestaff and rotating medical students at Johns Hopkins.
- 2013-present Module Director, “Traumatic Brain Injury.” Similar to above, I help organize and lead a month of weekly lectures on this topic given to PMR housestaff and rotating medical students at Johns Hopkins.

### **CLINICAL ACTIVITIES:**

#### **Certification**

- 2003 - present Maryland License #D60459  
1991 - present Argentina, Medical license #51477

Boards, other specialty certifications

- 2004 - 2024 American Board of Physical Medicine and Rehabilitation #7517

#### **Clinical (Service) Responsibilities**

- 1997 - 1999 Inpatient general neurology service, attending, 4 month/year; FLENI Institute, Buenos Aires, Argentina

- 1997 - 1999 Outpatient neurorehabilitation clinic, medical director, 2 days/week, FLENI Institute, Buenos Aires, Argentina
- 1997 - 1999 Inpatients neurorehabilitation services, attending for neurorehabilitation patients admitted to FLENI Institute, Buenos Aires, Argentina.
- 2003 - present Outpatient Neurorehabilitation Program, Medical Director, clinic ½ day /week and weekly interdisciplinary meetings; Johns Hopkins.
- 2003 - 2010 EMG clinic, attending, ½ day per week; Good Samaritan Hospital.
- 2010 - present EMG clinic, attending, ½ day per week; Johns Hopkins Bayview Medical Center.

### **Clinical Program Building/Leadership**

- 6/97 - 5/99 FLENI Adult Rehabilitation Hospital, member of the planning and development committee. In this capacity, I was responsible for the development of a 120 beds free standing neurological rehabilitation hospital. This was the first rehab facility built in Argentina following US standards with the goal of providing inpatient and outpatient neurological rehabilitation services.
- 8/03 - present Medical Director, Outpatient Neurorehabilitation Program, Dept. of Physical Medicine and Rehabilitation. I co-direct this program with a neuropsychologist, first with Dr. Felicia Hill Briggs and more recently with Dr. Kathleen Kortte. In this capacity, I helped organize and develop this comprehensive rehabilitation outpatient program that provides care for neurological patients who need rehab services. The program integrates the work of physical therapy, occupational therapy, speech language pathology, neuropsychology, social work and psychiatry with the goal of helping neurological patients recover and re-integrate to society with the highest level of independence possible.

### **Clinical Extramural Funding**

- 2006 Women's Board of The Johns Hopkins Hospital Grant. An award for \$13,410.85 was obtained to support the development of the Outpatient Neurorehabilitation Program. This grant provided a comprehensive set of audiovisual (AV) equipment, augmentative/alternative communication equipment for patients with communication impairments, and equipment to assess vision and driving abilities.

## **SYSTEM INNOVATION and QUALITY IMPROVEMENT Activities**

### **ORGANIZATIONAL ACTIVITIES:**

#### **Institutional Administrative Appointments**

- 1997 - 1999 FLENI Adult Rehabilitation Hospital, Planning and development committee, FLENI, Buenos Aires, Argentina. Responsible for the development of a 120 beds free standing neurological rehabilitation hospital. My work comprised from reviewing architectural design, financial and marketing analysis, to development of operations, workflow, and personnel selection. In addition, I was involved in planning the training and education of the entire rehabilitation team, including nursing, physiatrists, neurologists, PT, OT, SLP, and psychologists, as well as organize rotations of the rehab team at the University of Maryland.
- 2003 - present Medical Director, Outpatient Neurorehabilitation Program, Dept. of PM&R, Johns Hopkins.
- 2006 - present Director, Human Brain Physiology and Stimulation Laboratory, Dept. of PM&R, Johns Hopkins.
- 2008 United Way Campaign, Department of PM&R representative, Johns Hopkins.
- 2009 – present Organize and run the "Sensorimotor Research Day." This 1-day event allows interaction of more than 10 different Hopkins Labs with participation of NIH scientists interested on sensorimotor research.
- 2010 - 2011 Member of the ENT department director search committee, Johns Hopkins.
- 2011 - present Vice Chair for Research, Department of PM&R, Johns Hopkins.
- 2011 Completed Leadership Development Program, Johns Hopkins.
- 2011 Selected by the Provost, Dr Lloyd Minor, to participate in the working group: "Human-Machine Learning." Johns Hopkins.
- 2012 Strategic Research Planning Committee: Early T1 Translation Approaches task force, Johns Hopkins.
- 2012 - present T32 Co-Director. Pediatric and Adult Rehabilitation T32 co-sponsored by KKI and the JHSOM PM&R Dept.
- 2014 - present Member of the Johns Hopkins Medicine Research Council.
- 2015 - present Interim Director, Department of PM&R, Johns Hopkins. At the request of Dean Paul Rothman I assumed in this position January 1 of 2015. During this time I have been responsible for the clinical

and academic operations of the PMR Dept. Major accomplishments during this time have been the recruitment of 5 new faculty members (2 MDs and 3 Clinical Psychologists), the creation of a new advanced specialty training Spinal and Musculoskeletal Fellowship, and opening rehabilitation therapy services at Johns Hopkins White Marsh as well as within Johns Hopkins Community Physicians.

- 2015 - present Member of the Johns Hopkins Medicine Compensation Committee.
- 2015 Co-chair of the Youth Mentoring Task Force. This workgroup focused on developing actionable, impactful and sustainable ideas to help Baltimore community in the area of mentoring their youth.

### **EDITORIAL ACTIVITIES**

- 2009 - present Editorial Board, American Journal of Physical Medicine & Rehabilitation.

Journal peer-review activities, Reviewer:

- 2005 - present Neuroimage
- 2005 - present Journal of Physiology
- 2005 - present Neurorehabilitation and Neural Repair
- 2006 - present Stroke
- 2007 - present American Journal of Physical Medicine and Rehabilitation
- 2007 - present Archives of Physical Medicine and Rehabilitation
- 2008 - present Neurobiology of Aging
- 2009 - present Journal of Neurophysiology
- 2010 - present Journal of Neuroscience
- 2010 - present Journal of Cognitive Neuroscience
- 2010 - present Cerebral Cortex
- 2010 - present Neuron
- 2011 - present Brain
- 2011 - present The Lancet
- 2012 - present Neurology
- 2012 - present Molecular Psychiatry
- 2012 - present Current Biology
- 2012 - present Annals of Neurology
- 2013 - present Brain Stimulation
- 2014 - present Trends in Cognitive Sciences
- 2015 - present Nature communications

### **Advisory Committees, Review Groups/Study Sections**

- 2006 - present Ad hoc grant reviewer, The German Research Foundation DFG and the German Federal Ministry of Education and Research (BMBF).
- 2007 Ad hoc grant reviewer, DANA foundation.
- 2007 Ad hoc grant reviewer, Rehabilitation Research and Development Study Section, Veterans Affairs Administration.
- 2008 - 2009 Ad hoc grant reviewer, Center for Scientific Review, NIH: Neuro-Technology Study Section.
- 2009 Ad hoc grant reviewer, Center for Scientific Review, NIH: CDRC Study Section.
- 2009 - 2013 Member, Center for Scientific Review, NICHD, NIH: Function, Integration and Rehabilitation Sciences (FIRS) Subcommittee,
- 2009 - present Ad hoc grant reviewer, Medical Research Council (MRS), United Kingdom.
- 2010 - 2011 Discussant, NICHD Scientific Vision Process: "Plasticity."
- 2010 - 2011 Team leader and speaker, NICHD Scientific Vision Process: "Diagnostics & Therapeutics."
- 2010-present Advisory Board Member, Rehabilitation Medicine Scientist Training Program (RMSTP), a K12 funded program by the NIH and the Association of Academic Physiatrist.
- 2011 Ad hoc grant reviewer, Donoghue Foundation.
- 2011 - present Ad hoc grant reviewer, Wellcome Fund Trust, United Kingdom.
- 2014 Ad hoc grant reviewer, Center for Scientific Review, NIH: ETTN Study Section.
- 2014 Ad hoc reviewer, JHM Research council, Discovery fund.

**Professional Societies**

- 2001- 2003 Member, American Academy of Physical Medicine and Rehabilitation
- 2003 - present Fellow, American Academy of Physical Medicine and Rehabilitation
- 2003 - present Member, Association of Academic Physiatrists
- 2003 - present Member, Society for Neuroscience
- 2005 - 2006 Member, Academic Affairs Committee, Association of Academic Physiatrists
- 2005 - 2007 Member, Organization for Human Brain Mapping
- 2007 - present Member, Neural Control of Movement Society
- 2007 - present Member, Program Committee, Association of Academic Physiatrists
- 2009 - 2011 Member, Program Committee, American Society of Neurorehabilitation.
- 2010 - 2011 Chair, Research Council, Association of Academic Physiatrists.
- 2010 - present Member, Advisory Board, Rehabilitation Medicine Scientist Training Program, Association of Academic Physiatrists
- 2012 - present Member, Research Committee, Association of Academic Physiatrists.

**Conference Organizer, Session Chair**

- 6/07 Workshop Director, International Society Physical Rehabilitation Medicine, 4<sup>th</sup> World Congress, Seoul, Korea
- 9/07 Scientific Session Director, 2<sup>nd</sup> Pan-American Congress of Neurorehabilitation, Buenos Aires, Argentina.
- 3/08 Panel director, Annual Meeting of the Brain Injury Association of Maryland, Columbia, MD
- 1/09 Session Chair, 42<sup>nd</sup> Annual Winter Conference on Brain Research, Colorado, USA.
- 4/10 Panel director, Neural Control of Movement Annual meeting, Naples, Florida.
- 5/11 Organizational committee, Johns Hopkins Traumatic Brain Injury, A National Conference: From Impact to Recovery, Johns Hopkins.
- 1/12 Session chair, 42<sup>nd</sup> Annual Winter Conference on Brain Research, Salt Lake City, Utah.
- 4/12 Course director, Association of Academic Physiatrist Annual Meeting, Las Vegas, Nevada.
- 3/13 International Organizational Committee Member, 5th International Conference on Non-Invasive Brain Stimulation, Leipzig, Germany.
- 10/13 Workshop director, American Academy of Physical Medicine and Rehabilitation Annual meeting, Washington DC.
- 10/13 Director and International Organizer, International Symposium of Neurorehabilitation, INECO, Buenos Aires Argentina.
- 3/14 Co-chair. “NiBS – Innovative neurorehabilitation after stroke” 30th International Congress of Clinical Neurophysiology (ICCN) of the IFCN, Berlin, Germany.

**Consultantships**

- 2010 Avanir Pharmaceuticals
- 2012 - 2013 Merz Pharmaceuticals
- 2013 Moss Rehabilitation Research Institute
- 2015 Developing Rehabilitation Research Capacity, Baylor Health Care, Dallas, Texas.

**RECOGNITION****Awards, Honors**

- 1997 “Fellows Award for Research Excellence (FARE).” FARE was begun in 1995 to provide recognition for the outstanding scientific research performed by intramural postdoctoral fellows. National Institute of Health.
- 2003 Selected for the “Rehabilitation Medicine Scientist Training Program (RMSTP).” This program provides funding to physiatrists interested on developing as scientists. Association of Academic Physiatrists
- 2003 “ERF New Investigator Award.” This award provides seed money to physiatrist performing rehabilitation research. Foundation for Physical Medicine and Rehabilitation
- 2005 Best Paper Presentation Award. This award recognizes the best paper presentation during the annual meeting of the Association of Academic Physiatrists.
- 2006 “Clinician Scientist Award.” Johns Hopkins University.
- 2006 “Dennis W. Jahnigen Career Development Scholars Awards.” American Geriatric Society
- 2006 “Best Paper Presentation Award.” American Society of Neurorehabilitation, ASNR 13<sup>th</sup> Annual

- Meeting, ACRM-ASNR Joint Conference
- 2006 Selected for “Program for Academic Leadership.” This is a three-year program to develop academic leadership skills in junior PM&R faculty. Association of Academic Physiatrists
- 2007 “Young Academician Award.” This award honors an academic physiatrist who has demonstrated outstanding performance in the areas of teaching, research and/or administration. Association of Academic Physiatrists.
- 2010 Received from President Barack Obama the “**Presidential Early Career Award for Scientists and Engineers (PECASE)**.” the highest honor bestowed by the U.S. government on outstanding scientists and engineers in the early stages of their independent research careers.
- 2010 “The Outstanding Neurorehabilitation Clinician Scientist Award.” The award is given to one faculty member per year, based on the evaluation of his or her peers, for work on mechanisms of neural repair, translational research from mechanisms of repair, or clinical Neurorehabilitation. American Society for Neurorehabilitation

### Invited Talks, Panels

#### Local and National Invited Lectures

- 11/94 Grand Round, "Neuroplasticity." Montebello Rehabilitation Hospital, University of Maryland, Baltimore, MD.
- 9/02 Research seminars invited speaker, “Functional Relevance of Cortical Plasticity.” University of Texas at El Paso
- 5/03 Invited speaker, “Dysphagia and Neuroplasticity.” Continue Education Seminars, Baltimore Adult Communication Disorders Interest Group, Johns Hopkins; Baltimore, MD.
- 6/03 Grand rounds, “Neuroplasticity and Enhancement of Recovery after Stroke.” Dept. of PMR, Johns Hopkins, Baltimore, MD
- 8/03 Grand rounds, “Neuroplasticity in the recovery after Stroke.” Dept. of Neurology, Johns Hopkins Bayview Medical Center, Baltimore, MD.
- 4/04 Grand rounds, “Influence of Somatosensory Input in Human Neurorehabilitation.” Medical Neurology Branch, NINDS, NIH, Bethesda, MD.
- 9/04 Grand rounds, “A Forgotten Strategy? Somatosensory Input can Modulate Human Neurorehabilitation.” National Rehabilitation Hospital, Washington DC
- 5/05 Research seminar, “Encoding Motor Memories on the Older Adult by Action Observation.” Human Motor Control Section, NINDS, NIH.
- 11/05 Invited Speaker, “Action Observation can Form Memories.” Behavioral Neurology Section Seminars, Dept. of Neurology, Johns Hopkins.
- 3/06 Invited speaker “Transcranial Magnetic Stimulation and Stroke Recovery.” “Course C: New Technologies and their Application to Rehabilitation Research.” Annual Meeting of the Association of Academic Physiatrist.
- 4/07 Speaker, “Scientific Autobiography.” Association of Academic Physiatrist annual meeting San Juan, Puerto Rico.
- 3/08 Invited panel speaker, “Grant writing skills.” Association of Academic Physiatrists, Anaheim, CA
- 3/08 Panel director and speaker, “Neuroplasticity and the recovery of function after brain lesions.” Annual Meeting of the Brain Injury Association of Maryland, Columbia, MD.
- 4/08 Grand rounds, Can Action Observation be used as a Strategy to Enhance beneficial Effects of Motor Training in Neurorehabilitation after Stroke? Spaulding Rehabilitation Hospital, Harvard, Boston MA
- 1/09 Course Chair and speaker, “Brain Stimulation Techniques to Enhance Motor Function after Stroke.” 42nd Annual Winter Conference on Brain Research; Colorado.
- 2/09 Grand rounds, “Non-Invasive Brain Stimulation to Enhance Motor Function after Stroke.” Department of Neurology, Johns Hopkins University.
- 2/09 Invited speaker, “Lessons learned in the course to my first R01” Research council, Association of Academic Physiatrists
- 5/09 Invited speaker, “Non-Invasive Stimulation to Enhance Motor Function in Healthy and after Stroke” NCCU lecture series, Department of Neurology, Neurosurgery and Anesthesia.
- 6/09 Invited speaker, “Transcranial Magnetic Stimulation as a predictor of motor recovery and treatment to enhance recovery of motor function.” Electrical Stimulation in Neurologic Rehabilitation; The Neuro-Cognitive Rehabilitation Research Network (NCRRN) and The Center for Experimental Neurorehabilitation Training (CENT), Philadelphia, PA.
- 7/09 Grand rounds, “Understanding and Enhancing Recovery of Motor Function after Stroke.” Department of PMR, Pittsburgh University, Pittsburgh, PA.

- 12/09 Grand rounds, "Modulation of Cerebellar Function with Non-Invasive Stimulation." Department of PMR, Columbia University.
- 2/10 Invited speaker, "Enhancing Motor Function with Non-Invasive Brain Stimulation in Healthy and after Stroke." Clinical Neuroscience Seminar, Neurology Dept. Johns Hopkins.
- 3/10 Invited speaker, "Applications of TMS and tDCS to Modulate Motor Performance." International Brain Injury Association Annual Meeting, Washington DC.
- 4/10 Course director and speaker, "Using TMS to study connectivity in the context of motor behaviour." Neural Control of Movement Annual meeting, Naples, Florida.
- 6/10 Speaker, "Non-invasive cerebellar stimulation to improve motor learning." Brain Science Institute, mini symposium, Johns Hopkins.
- 11/10 Invited speaker, "Understanding the cerebellar role during learning with non-invasive brain stimulation" Clinical Neuroscience Seminar, Neurology Dept. Johns Hopkins.
- 11/10 Invited speaker, "Augmenting Motor Function in Stroke Patients and Healthy Individuals." Theodore M. Cole Resident Research Day, Dept. of PMR, University of Michigan.
- 12/10 Grand Rounds, "Augmenting Motor Learning Processes for the Benefit of Neurological Rehabilitation" Burke Rehabilitation Institute, Cornell University, White Plains, NY.
- 12/10 Invited speaker, "Using Transcranial Magnetic Stimulation and Direct Brain Polarization to Understand and Improve Motor Behavior." Neural and Behavioral Science Seminar, State University of New York, SUNY Downstate, Brooklyn, NY.
- 4/11 Invited speaker, "Enhancing Motor Learning with Non-Invasive Brain Stimulation." Association of Academic Physiatrist, Course B; Phoenix, Arizona.
- 4/11 Invited speaker, "Using non-invasive brain stimulation to understand human motor learning." Neural Control of Movement Society. Satellite Meeting, Motor learning: behavior, computation, and pathology. San Juan, Puerto Rico.
- 4/11 Invited speaker, "Human See, Human Do, But How?" Neural Control of Movement Society, San Juan, Puerto Rico.
- 5/11 Invited Speaker, "Understanding the cerebellar role during learning with non-invasive brain stimulation." Human Cortical Physiology Section, NINDS, NIH; Bethesda, MD.
- 5/11 Invited speaker, "Using non-invasive brain stimulation to understand and enhance human motor learning." Applied Physics Laboratory, Johns Hopkins University, Columbia, MD.
- 11/11 Keynote Speaker, "Human Cortical Physiology and Neurorehabilitation (Back to Mechanisms)." Society for Neuroscience, American Society for Neurorehabilitation satellite; Washington, DC.
- 11/11 Invited Speaker, "Non-invasive Cerebellar Stimulation (tDCS): Background, Methods and Applications." Society for Neuroscience, Methods for Studying Human Cerebellar Structure and Function Satellite; Baltimore, MD.
- 11/11 Invited speaker, "Modulation of Motor Function Using Non-Invasive Brain Stimulation." American Academy of Physical Medicine and Rehabilitation, Orlando, FL.
- 1/12 Panel chair and speaker, "Understanding and enhancing motor behavior with non-invasive brain stimulation for the benefit of healthy and stroke patient." Winter Brain Conference in Neuroscience; Salt Lake City, Utah
- 2/12 Grand Rounds "Understanding and enhancing motor behavior in healthy individuals and stroke patients." PMR Dept, University of Alabama; Birmingham, Alabama.
- 2/12 Course director and speaker, "TMS & tDCS: Non-invasive Brain Stimulation to Understand Brain Function and Recovery." Association for Academic Physiatrist, Course B; Las Vegas, Nevada.
- 2/12 Speaker, "Preparing the Phase I Application." Association for Academic Physiatrist, RMSTP lectures; Las Vegas, Nevada.
- 2/12 Speaker, "Pathways for research success." Association for Academic Physiatrist, RMSTP lectures; Las Vegas, Nevada.
- 2/12 Speaker, "Mentors." Association for Academic Physiatrist, RMSTP lectures; Las Vegas, Nevada.
- 4/12 Invited speaker, "Using non-invasive brain stimulation to understand and enhance human motor learning." Clinical Neurophysiology Fellowship, Dept. of Neurology, Johns Hopkins
- 11/12 Invited speaker, "Can a 9v Battery Help You Behave?" Brain Night series, Brain Science Institute, Johns Hopkins.
- 2/13 Invited speaker, "Neurophysiological mechanisms underlying human motor learning retention and interference." Bodian Seminar, Krieger Mind Brain Institute, Dept of Neuroscience, Johns Hopkins.

- 2/13 Invited speaker, "Transcranial Direct Current Stimulation as a Tool to Both Study and Enhance Sensorimotor Adaptation." Symposium by invitation only: "Effects of Long Duration Spaceflight on Brain and Behavior." National Space Biomedical Research Institute, NASA; Houston, TX
- 3/13 Speaker "Preparing the Phase I Application." Association for Academic Physiatrist, RMSTP lectures; New Orleans, Louisiana
- 3/13 Speaker, "Pathways for research success." Association for Academic Physiatrist, RMSTP lectures; New Orleans, Louisiana
- 4/13 Invited speaker, "Using Direct Current Stimulation to Study Cerebellar Contributions to Motor Learning." Neural Control of Movement Conference Annual meeting; San Juan, Puerto Rico.
- 6/13 Keynote speaker, "Understanding and Augmenting Human Motor learning with Brain Stimulation." Dept. of Neuroscience 16th annual retreat, University of Maryland; Baltimore, MD
- 9/13 Grand rounds discussant, "Motor kinematics in the context of recovery after stroke" Dept. of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.
- 10/13 Workshop director and speaker, "Transcranial magnetic stimulation and transcranial direct current stimulation: A hands on Experience." American Academy of PMR Annual meeting, Washington, DC.
- 1/14 Invited speaker, "LTP-like Changes: Potential Mechanisms Underlying Human Motor Learning Retention and Interference" 47th annual meeting of Winter Brain Research Conference, Colorado,
- 2/14 Speaker "Preparing the Phase I Application." Association for Academic Physiatrist, RMSTP lectures; Nashville TN
- 2/14 Speaker "Grant writing 101." Association for Academic Physiatrist, RMSTP lectures; Nashville TN
- 2/14 Speaker "Responsible conduct of research." Association for Academic Physiatrist, RMSTP lectures; Nashville TN.
- 3/15 Speaker, "Preparing a K award Application." Association for Academic Physiatrist. RMSTP, San Antonio, Texas.
- 3/15 Speaker, "Responsible conduct in research." Association for Academic Physiatrist. RMSTP, San Antonio, Texas.
- 4/15 Grand rounds, "Understanding Physiological Processes and Neural Correlates Underlying Human Motor Learning" Dept. of Occupational Sciences and Therapy, University of South California, California.

### **International Invited Lectures**

- 12/97 Invited Speaker, "Neuroplasticity, the ground for Neurorehabilitation." Neurology Course 1997, Cordoba Society of Neurology, Cordoba, Argentina.
- 3/98 Grand Round "Plastic changes in the Brain and Transcranial Magnetic Stimulation." French Hospital, University of Buenos Aires, Argentina.
- 4/98 Invited speaker, "Management of the Quadriplegic patient." V Congress of the IberoAmerican Society of Neuro-Urology and Uro-Gynecology, Buenos Aires, Argentina.
- 5/98 Invited speaker, "Neuroplasticity and Rehabilitation." 3rd Annual Meeting of the Physical Therapist Argentinean Society, Buenos Aires, Argentina.
- 3/05 Invited speaker, "The scientific career in USA." School of Public Health, University of Buenos Aires, Buenos Aires, Argentina.
- 3/05 Invited speaker, "Studies of Neuroplasticity in Humans." Department of Human Physiology, School of Medicine, University of Buenos Aires, Argentina.
- 3/06 Invited speaker, "Role of Ventral Premotor Cortex in Learning and Consolidating Visuomotor Movements." Research Seminar, Dept. of Neurology, Tuebingen University, Germany.
- 3/06 Invited speaker, "Neural Substrates Underlying Formation of Internal Models of a Visuomotor Task." Research Seminar, Dept. of Radiology, Tuebingen University, Germany.
- 3/06 Invited speaker, "Effects of Somatosensory Stimulation on Motor Learning after Stroke." Grand Rounds, Dept. of Neurology, Wuerzburg University, Germany.
- 4/06 Invited Speaker, "Mechanisms of Motor Recovery after Stroke" and "Modulation of Cortical Plasticity to Enhance Motor Recovery After Stroke." IV Neurorehabilitation Course, Fundacion Rosarina de Neurorehabilitacion, University of Rosario, Rosario, Argentina.
- 4/06 Invited speaker, "Cortical Plasticity and Mechanisms of Motor Recovery after Stroke." Grand Round, Dept. of Neurology, French Hospital, University of Buenos Aires, Buenos Aires, Argentina.

- 4/06 Invited speaker, “Modulation of Cortical Plasticity to Enhance Motor Recovery after Stroke.” Grand Round, Dept. of Neurology, FLENI, University of Buenos Aires, Buenos Aires, Argentina.
- 10/06 Keynote Speaker, “The new therapeutic tools for cognitive disorders.” Plenary Session, 2nd Meeting of the European Societies of Neuropsychology, Toulouse, France.
- 11/06 Keynote Speaker, “Brain plasticity associated with motor recovery after cerebral damage in humans.” Sociedad Argentina de Investigación en Neurociencias, Cordoba, Argentina.
- 11/06 Invited Speaker, “Can we enhance motor recovery after Stroke?” Grand Round, Dept. of Neurology, Favaloro Foundation, Favaloro University, Buenos Aires, Argentina.
- 3/07 Speaker, “Does our current understanding of motor learning and memory actually help patients?” Plenary Session, Annual meeting of the Neural Control of Movement Society; Seville, Spain.
- 5/07 Speaker and Workshop Director, “Cortical physiology and mechanisms of recovery after stroke” International Society Physical Rehabilitation Medicine, 4<sup>th</sup> World Congress, Seoul, Korea
- 9/07 Invited Speaker, “Peripheral Nerve Stimulation to Enhance Motor Function after Stroke.” 80<sup>th</sup> German Neurological Society Annual Meeting, Berlin, Germany.
- 9/07 Invited Speaker, “Brain Stimulation Techniques to Enhance Motor Function after Stroke.” 2<sup>nd</sup> Latin American Meeting, World Conference on Neurorehabilitation, Buenos Aires, Argentina.
- 9/08 Invited Speaker, “Enhancing motor training effects with Action Observation in healthy and after stroke.” 1st Congress of Latin American, Caribbean, Iberia Peninsula Neurosciences; Buzios, Brazil.
- 5/09 Invited Speaker, “Understanding and Enhancing Upper Extremity Function after stroke with TMS.” Neurorehabilitation Symposium 2009, Peracute Rehabilitation – Jolting Recovery? Zurich, Switzerland.
- 9/09 Invited Speaker, “Novel developments to enhance recovery of motor function after stroke.” Update in Neuroscience and Clinical Neurology, University of Rosario and Argentinean Neurological Society, Rosario, Argentina.
- 3/10 Invited Speaker, “Understanding and Augmenting Motor Learning Processes using Neurorehabilitation Strategies.” 6<sup>th</sup> World Congress in Neurological Rehabilitation. Vienna, Austria.
- 10/10 Keynote Speaker, “Understanding and Augmenting Motor Learning Processes for the Benefit of Neurological Rehabilitation.” Plenary Session, 2010 Joint meeting American Congress Rehabilitation Medicine and American Society of Neurological Rehabilitation. Montreal, Canada.
- 10/10 Invited Speaker, “Understanding the cerebellar role during learning with non-invasive brain stimulation” Math Neuroscience Seminar Series, University of Montreal, Canada.
- 11/10 Keynote Speaker, “Recuperación motora luego del ACV: nuevos avances y nuevas estrategias.” Invited International Speaker, III Jornadas de Neurorehabilitación INEBA “De las Ciencias Básicas a la Clínica.” Buenos Aires, Argentina.
- 11/10 Speaker, “Estudiando y aumentando el aprendizaje motor para el beneficio de la NR.” Invited International Speaker, III Jornadas de Neurorehabilitación INEBA “De las Ciencias Básicas a la Clínica.” Buenos Aires, Argentina.
- 9/11 Invited Speaker, “Action Observation Therapy as a Neurorehabilitation Strategy” and “Cerebellar Lesions and Response To Split-belt Treadmill Training.” German Neurological Society Meeting. Germany.
- 4/12 Speaker, “Neurophysiological Mechanisms Underlying Retention and Interference of Skill Learning.” University College of London and Johns Hopkins Collaborative Conference; London, England.
- 4/12 Discussant, “Has motor neuroscience had any clinical impact?” University College of London and Johns Hopkins Collaborative Conference; London, England.
- 5/12 Invited speaker, “Understanding and Modulating Human Motor Learning Processes with Brain Stimulation.” Neuroscience seminar series, Donders Neuroscience Institute, Nijmegen, Netherlands.
- 5/12 Invited speaker, “Modulation of Motor Learning via Brain Stimulation” Neuroscience seminar series. University of Luvaine, Brussels, Belgium.
- 5/12 Keynote Speaker, “Nuevos Conceptos e Intervenciones Terapeuticas Sobre los Procesos de Recuperacion Neurological Luego de Lesiones en el SNC.” International Symposium of Rehabilitation, INECO, Buenos Aires, Argentina.
- 7/12 Invited speaker, “Motor learning in stroke” Federation of European Neuroscience Annual Meeting, Barcelona, Spain.
- 3/13 Invited speaker and International Organizational Committee Member, “Using Non-Invasive Brain Stimulation to Study Cerebellar Contributions to Motor Learning” 5th International Conference on

Non-Invasive Brain Stimulation, Leipzig, Germany.

- 5/13 Invited Speaker, “Neuroscience and Neurorehabilitation: use of non-invasive brain stimulation and other novel interventions.” 20 years celebration of Neurorehabilitation, Tanti, Cordoba, Argentina.
- 9/13 Invited speaker, “Neurophysiological mechanisms underlying human motor learning retention and interference” Research Seminar Series, University College of London, London, England
- 9/13 Invited speaker, “Understanding cerebellar contributions to motor learning with non-invasive stimulation.” Grand Round, Neurology Dept., Essen University, Essen, Germany.
- 10/13 Invited speaker, “Augmenting motor learning as a strategy to enhance motor function in patients with motor deficits.” Opening symposium, Cereneo center for neurological rehabilitation, Vitznau, Switzerland.
- 10/13 Director, International Organizer and Speaker, “Neuroplasticity: The science behind neuro-rehabilitation.” International Symposium of Neurorehabilitation, INECO, Buenos Aires Argentina.
- 3/14 Invited speaker, “Adaptive, maladaptative and epiphenomenal functional brain changes in human stroke” 30th International Congress of Clinical Neurophysiology (ICCN) of IFCN, Berlin, Germany.
- 7/14 Invited speaker, “Understanding and Modulating Motor learning with Cerebellar Stimulation”, Sixth International Congress of the Society for Research on the Cerebellum, Rome, Italy.
- 8/14 Invited speaker, “Stroke rehabilitation: an update” 15<sup>th</sup> Congreso Internacional de Medicina Interna del Hospital de Clínicas de la Universidad de Buenos Aires, Argentina.
- 10/14 Invited keynote speaker, “Bases fisiológicas y tipos de aprendizaje motor” and “Estrategias para aumentar el aprendizaje motor, TMS.” XXVI Congreso de la Asociación Médica Latino Americana de Rehabilitación (AMLAR), Viña del Mar, Chile.
- 6/15 Invited Speaker, “Neurophysiological markers of motor learning”, 11th Computational Motor Control Workshop, Ben Gurion University of the Negev, Beer Sheva, Israel.

#### **OTHER PROFESSIONAL ACCOMPLISHMENTS**

- 11/12 Named to “Top PMR Doctors in Baltimore,” by Baltimore Magazine