

# JAVIER F. MEDINA, Ph.D.



## PERSONAL DATA

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Date and place of birth: Feb. 19, 1969. Madrid  
Citizenship: Spain (valid USA green-card)  
Marital status: Married

## CONTACT DETAILS

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University of Pennsylvania  
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## RESEARCH SUMMARY

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Goal: To understand the neural circuits and mechanisms of plasticity that underlie motor learning and movement timing, and to translate findings into the clinical realm by identifying therapeutic entry points for the treatment of movement disorders

Interests: Learning/Memory – Timing – Neural coding – Sensory-motor integration

Methods: Behavioral assays – Pharmacological manipulation – Computer models and simulation  
Single and multi-electrode recordings in awake-behaving animals

Significance: Memory – Movement disorders – Cerebellar dysfunction – Robotics – Neuroprosthetics

## EDUCATION

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Ph.D.	Neuroscience University of Texas – Houston	2000
B.S. ( <i>Summa Cum Laude</i> )	Physics Drexel University – Philadelphia	1993
B.S. ( <i>Summa Cum Laude</i> )	Computer Science Drexel University – Philadelphia	1993

## RESEARCH POSITIONS

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Assistant Professor	Department of Psychology University of Pennsylvania – Philadelphia	since 1/2008
HHMI Post-doctoral Fellow	Keck Center for Integrative Neuroscience University of California – San Francisco Advisor: Dr. Stephen Lisberger	2000 – 2007
Graduate Student	Keck Center for Learning & Memory University of Texas – Houston Advisor: Dr. Michael Mauk	1993 – 2000
Undergraduate Researcher	Department of Physics Drexel University – Philadelphia Advisor: Dr. Michel Vallieres	1991 – 1993

## PROFESSIONAL EXPERIENCE

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Computer Network Manager	SIEMCO Carquefou (France)	1992
Laboratory Technician	DuPont Marshall Laboratory Philadelphia, PA	1991

## TEACHING EXPERIENCE

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Lecturer	Neurobiology of Behavior Universidad Pablo de Olavide – Sevilla	since 2004
Lecturer	Systems Neuroscience University of Texas – Houston	Fall 2001
Adjunct Lecturer	Computer Simulation of Neural Processes Rice University – Houston	Fall 1997
College Tutor	Scott Learning Center Drexel University – Philadelphia	1990 – 1993
Teaching Assistant	Academia Luis Vives Malaga, Spain	1988 – 1994
Teaching Assistant	High School Cerrado de Calderon Malaga, Spain	1987 – 1988

## HONORS & AWARDS

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Sigma Xi Award	Best PhD Thesis in the Houston area University of Texas – Houston	2001
Scholastic Achievement	Highest GPA in graduating class Drexel University – Philadelphia	1993
Chase Manhattan Prize	Full College Scholarship	1987
P.F. Tobin Award	Full High School Scholarship Prior Park College – Bath (England)	1983

## PROFESSIONAL MEMBERSHIP & SERVICES

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Member	Society for Neuroscience	since 1995
Grant Reviewer	National Science Foundation The Wellcome Trust Alzheimer's Association ANEP (Spain)	since 2000 since 2003 since 2006 since 2006
Journal Reviewer	Behavioral Brain Research Cerebellum Experimental Brain Research Genes, Brain & Behavior Journal of Neurophysiology	Journal of Neuroscience Learning & Memory Neuroscience Trends in Cognitive Sciences

## PUBLICATIONS

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1. **Medina JF**, Lisberger SG (2007) Variation, signal, and noise in cerebellar sensory-motor processing for smooth-pursuit eye movements. *Journal of Neuroscience* 27(25):6832-42.
2. Ohyama T, Nores WL, **Medina JF**, Riusech FA, Mauk MD (2006) Learning-dependent plasticity in the deep cerebellar nucleus. *Journal of Neuroscience* 26(49):12656-12663.
3. Carey MR, **Medina JF**, Lisberger SG (2005) Instructive signals for motor learning from visual cortical area MT. *Nature Neuroscience* 8(6):813-819
4. **Medina JF**, Carey MR, Lisberger SG (2005) The representation of time for motor learning. *Neuron* 45(1):157-167
5. **Medina JF**, Nores WL, Mauk MD (2002) Inhibition of climbing fibres is a signal for the extinction of conditioned eyelid responses. *Nature* 416:330-333
6. **Medina JF**, Repa JC, Mauk MD, LeDoux JE (2002) Parallels between cerebellum- and amygdala-dependent conditioning. *Nature Reviews Neuroscience* 3(2):122-131
7. **Medina JF**, Garcia KS, Mauk MD (2001) A mechanism for savings in the cerebellum. *Journal of Neuroscience* 21(11):4081-4089.
8. **Medina JF**, Mauk MD (2000) Computer simulation of cerebellar information processing. *Nature Neuroscience* 3:1205-1211.
9. Mauk MD, **Medina JF**, Nores WL, Ohyama T (2000) Cerebellar function: Coordination, learning or timing? *Current Biology* 10:R522-R525.
10. **Medina JF**, Garcia KS, Nores WL, Taylor NM, Mauk MD (2000) Timing mechanisms in the cerebellum: Testing predictions of a large-scale computer simulation. *Journal of Neuroscience* 20(14):5516-5525.
11. **Medina JF**, Nores WL, Ohyama T, Mauk MD (2000) Mechanisms of cerebellar learning suggested by eyelid conditioning. *Current Opinion in Neurobiology* 10(6):717-24.
12. Nores WL, **Medina JF**, Steele PM, Mauk MD (2000) Relative contributions of the cerebellar cortex and cerebellar nucleus to eyelid conditioning. In: *Eyeblink Classical Conditioning: Volume II* (Woodruff-Pak DS, Steinmetz JE, eds), pp 205-228. Kluwer Academic Publishers.
13. **Medina JF**, Mauk MD (1999) Simulations of cerebellar motor learning: Computational analysis of plasticity at the mossy fiber to deep nucleus synapse. *Journal of Neuroscience* 19(16):7140-7151.
14. Steele PM, **Medina JF**, Nores WL, Mauk MD (1998) Using genetic mutations to study the neural basis of behavior. *Cell* 95:879-882.
15. Kenyon GT, **Medina JF**, Mauk MD (1998) A mathematical model of the cerebellar-olivary system II: Motor adaptation through systematic disruption of climbing fiber equilibrium. *Journal Computational Neuroscience* 5:71-90.
16. Kenyon GT, **Medina JF**, Mauk MD (1998) A mathematical model of the cerebellar-olivary system I: Self-regulating equilibrium of climbing fiber activity. *Journal Computational Neuroscience* 5:17-33.
17. Mauk MD, Garcia KS, **Medina JF**, Steele PM (1998) Does cerebellar LTD mediate motor learning? Toward a resolution without a smoking gun. *Neuron* 20:359-362.
18. Mauk MD, Steele PM, **Medina JF** (1997) Cerebellar involvement in motor learning. *The Neuroscientist* 3(5):303-313.

## IN PREPARATION

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1. **Medina JF**, Lisberger SG. Changes in Purkinje cell activity during learning of eye movements.
2. **Medina JF**, Lisberger SG, Bialek W. Contribution of single spikes in the cerebellum to behavior.