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Education:

- 2005-2011: **Ph.D.** Biomedical Science, National Autonomous University of Mexico
Advisor: Dr. Maria Corsi-Cabrera. Date of exam: June 28, 2011.
Title thesis: “*Neural correlates of rule-guided behavior under the effects of diazepam in men and women*” Published: ISBN 978-607-02-6015-05.
- 1999-2005: **Licenciatura** (B.A. equivalent) in Psychology, National Autonomous University of Mexico. Advisor: Dr. Maria Corsi-Cabrera.
Title thesis: “*Brain electric activity changes during an attention demanding task under diazepam*” Honorable Mention.

Research Experience:

- 2015-present: **Unidad de Trastornos del Movimiento y Sueño.** Research on brain oscillations and metabolic activity associated to sleep and movement disorders.
- 2012-2014: **University of Ottawa.** Postdoctoral Fellow. Research on brain oscillations phase and coherent activity associated to consciousness. Principal Researcher: Dr. Georg Northoff.
- 2011-2012: **Laboratory of Cognitive Neurogenomics**, National Autonomous University of Mexico. Advisor: Dr. Alejandra Ruiz-Contreras.
- Research on possible associations between memory and attention and genes encoding for the cannabinoid receptor type 1.
- 2003-2012: **Laboratory of Sleep**, National Autonomous University of Mexico. Advisor: Dr. Maria Corsi-Cabrera.
- Cognitive performance (attention, executive functions and emotion) and brain activity were measured during different awareness levels modulated by diazepam or sleep deprivation. The methods included a combination of behaviour, EEG and fMRI data.
 - Electroencephalographic data were acquired before, during and after neurosurgery in order to explore functional connectivity.
 - EEG quantitative was used to explore electrical brain pattern differences between similar sleep stages.
- 2000-2002: **Laboratory of Functional Neuroanatomy**, National Institute of Neurology and Neurosurgery, Advisor: Dr. Juan Valadez Rodriguez.

- Assist in acquiring neuropsychological and electrocorticographic data during neurosurgery.
- 1999-2000: **Clinic of Sleep**, National Autonomous University of Mexico. Advisor: Dr. Reyes Haro-Valencia.
- Assist with polygraphic recordings of narcolepsy and insomnia projects.

Publications:

Articles in peer reviewed journals

- 2014: Duncan, N. W., Wiebking, C., Munoz-Torres, Z., Northoff, G. How to investigate neuro-biochemical relationships on a regional level in humans? Methodological considerations for combining functional with biochemical imaging. **Journal of Neuroscience Methods**. 221: 183-188.
- Ruiz-Contreras, AE., Carrillo-Sánchez, C., Ortega-Mora, I., Barrera-Tlapa, MA., Román-López, TV., Rosas-Escobar, CB., Flores-Barrera, L., Caballero-Sánchez, U., Muñoz-Torres, Z., et al., Prospéro-García, O. Performance in working memory and attentional control is associated with the rs2180619 SNP in the CNR1 gene. **Genes, Brain and Behavior**. 13: 173-178.
- 2011: Muñoz-Torres, Z., del Río Portilla, Y., Guevara, MA., Corsi-Cabrera, M. Diazepam-induced changes in EEG oscillations during performance of a sustained attention task. *Journal of Clinical Neurophysiology*. 28: 394-399.
- Muñoz-Torres, Z., Armony JL., Trejo-Martínez, D., Conde, R., Corsi-Cabrera, M. Behavioural and neural effects of diazepam on a rule-guided response selection task. *Neuroscience Research*. 70: 260-268.
- 2008: del Río Portilla, Y., Muñoz-Torres, Z., Guevara, MA., Corsi-Cabrera, M. REM Sleep Post- Eye Movement Activation. *International Journal of Bioelectromagnetism*. 10: 192-208.
- 2006: Corsi-Cabrera, M., Muñoz-Torres, Z., del Río Portilla, Y., Guevara, MA. Power and coherent oscillations distinguish REM sleep, stage 1 and wakefulness. *International Journal of Psychophysiology*. 60: 59-66.

Book Chapters

- 2007: Corsi-Cabrera, M., del Río-Portilla, Y., Muñoz-Torres, Z. Sex-Steroid Dimorphic Effects on Functional Brain Organization: Differences in Cognition, Emotion and Anxiolysis. En: Czerbska, M. (Ed.) *Psychoneuroendocrinology Research Trends*, Nova Science Publishers, New York. ISBN 978-1-60021-665-7.

Fellowships & Distinctions:

- 2012-2013: Postdoctoral fellowship, Government of Canada.
Postdoctoral fellowship, Mexican Council of Science and Technology.
- 2011: Doctoral fellowship, National Autonomous University of Mexico.
Research assistant fellowship, Mexican Council of Science and Technology.
- 2007: International research internship funding, National Autonomous University of Mexico.
- 2006: Honorable Mention of the poster Efectos del Diazepam sobre la atencion intencional. *Congreso Nacional de Neuropsicologia*. Morelos, Mexico.
- 2005-2010: Doctoral fellowship, Mexican Council of Science and Technology.
- 2005: Bachelor's thesis dissertation *Honorable Mention*, National Autonomous University of Mexico.
- 2002: Award between the first three places in Bachelor of Psychology.
- 1999-2003: Bachelor's scholarship, National Autonomous University of Mexico.

Formal Communications:*Congresses and Symposia*

Muñoz-Torres Z., Armony JL., Trejo-Martínez D., Conde R., Corsi-Cabrera M. Sex Differences under Diazepam in Rule Guided Behavior: an fMRI study. *Cognitive Neuroscience Society Meeting*. Canada, 2010.

Muñoz-Torres Z., Armony JL., Trejo-Martínez D., Conde R., Corsi-Cabrera M. Metabolic Activity Related to Decision Making under Diazepam: An fMRI Study. *Society for Neuroscience Annual Meeting*. USA, 2009.

Rosales-Lagarde A., Armony JL., Trejo-Martínez D., Muñoz-Torres Z., Conde R., del Río-Portilla Y., Corsi-Cabrera M. Impaired rule-guided behavior after selective REM sleep deprivation: An fMRI Study. *Society for Neuroscience Annual Meeting*. USA, 2009.

Muñoz-Torres Z., Armony JL., Trejo-Martínez D., Conde R., Corsi-Cabrera M. Actividad Metabolica Relacionada al Seguimiento de Reglas Complejas bajo el Efecto del Diazepam: Estudio de Resonancia Magnetica funcional. *50 Congreso Nacional de Ciencias Fisiologicas*. Michoacan, Mexico, 2009.

International Symposia: Neuroimaging and Neuropsychiaty "Efectos del Diazepam en la Toma de Decisiones" *National Autonomous University of Mexico*, Mexico, 2008.

Rosales-Lagarde, A., Armony JL., Trejo-Martínez D., Muñoz-Torres Z., Conde R., del Río Portilla, Y., Corsi-Cabrera M. Cambios Metabolicos Asociados a la Toma de Decisiones bajo el Efecto del Diazepam. *X Reunion de Neuroimagen*, Guanajuato, Mexico, 2008.

Muñoz-Torres Z., Armony JL., Trejo-Martínez D., Conde R., Corsi-Cabrera M. Cambios Metabólicos Asociados a la Toma de Decisiones bajo el Efecto del Diazepam. *X Reunion de Neuroimagen*, Guanajuato, Mexico, 2008.

Symposia Psicologas en Neurociencias “Efectos de la Actividad Inhibidora sobre la cognición en humanos” *V Congreso de Investigación Formativa*, Mexico City, 2008.

Muñoz-Torres Z., del Río-Portilla Y., Corsi-Cabrera, M. Efectos del incremento en la actividad inhibitoria sobre la atención voluntaria. *L Congreso Nacional de Ciencias Fisiológicas*. Puebla, Mexico, 2007.

Muñoz-Torres Z., del Río-Portilla Y., Corsi-Cabrera, M. Temporal coupling and power spectra variations between phasic and tonic REM sleep across the night. *Society for Neuroscience Annual Meeting*. USA, 2006.

Corsi-Cabrera, M., del Río-Portilla Y., Muñoz-Torres Z., Increase slow and fast activity and decrease intrahemispheric coupling during REM sleep. *13th World Congress of Psychophysiology*. Turkey, 2006.

del Río-Portilla Y., Muñoz-Torres Z., Corsi-Cabrera, M. Power and coherent activity changes across REM sleep cycles. *13th World Congress of Psychophysiology*. Turkey, 2006.

Muñoz-Torres Z., del Río-Portilla Y., Corsi-Cabrera, M. Differential EEG effects of Diazepam between men and women during an attention demanding task. *13th World Congress of Psychophysiology*. Turkey, 2006.

Muñoz-Torres Z., del Río-Portilla Y., Corsi-Cabrera, M. Efectos del Diazepam sobre la atención intencional. *Congreso Nacional de Neuropsicología*. Morelos, Mexico, 2006.

Muñoz-Torres Z., del Río-Portilla Y., Guevara, M.A., Corsi-Cabrera, M. Sexual dimorphic diazepam effects on an attention demanding task: Quantitative EEG. *International Meeting of Mind and Electrophysiology*. Guadalajara, Mexico, 2005.

Symposia “Una mirada al cerebro: emociones, zurdos y hemisferios divididos” *IV Congreso de Investigación Formativa*, UNAM, Mexico City, 2005.

Symposia and workshop “El cerebro adicto” Grupo Psinapsis. *IV Congreso de Investigación Formativa*, Mexico City, 2005.

Muñoz-Torres Z., del Río-Portilla Y., Guevara, M.A., Corsi-Cabrera, M. Sexually dimorphic effects of diazepam during an attention demanding visual discrimination task. *Society for Neuroscience Annual Meeting*. USA, 2004.

del Río-Portilla Y., Muñoz-Torres Z., Guevara, M. A., Corsi-Cabrera M. Diazepam effects on EEG during an attention-demanding visual discrimination task: sex differences. *12th Congress of Psychophysiology*. Greek, 2004.

Muñoz-Torres Z., del Río-Portilla, Y., Guevara M.A., Corsi-Cabrera M., Efecto del Diazepam en Hombres y Mujeres Sobre una Tarea que Demanda Atención Visual: EEG Cuantitativo. *XLVII Congreso Nacional de Ciencias Fisiológicas*. Veracruz, Mexico, 2004.

Muñoz-Torres Z., del Río-Portilla Y., Guevara, M.A., Corsi-Cabrera, M. Power of fast but not slow frequencies distinguish stage 1 from wakefulness and changes in power and coherent activity distinguish REM sleep. *Society for Neuroscience Annual Meeting*. USA, 2003.

del Río-Portilla Y., Muñoz-Torres Z., Guevara M. A., Corsi-Cabrera M. Organización de la actividad oscilatoria del sueño MOR en el hombre. *IX Congreso de la Federación Latinoamericana del Sueño*. Mexico City, 2003.

Corsi-Cabrera M., Muñoz-Torres Z., del Río Portilla Y. Microarquitectura del EEG del sueño MOR fasico y tonico en el hombre. *IX Congreso de la Federación Latinoamericana del Sueño*. Mexico City, 2003.

Muñoz-Torres Z., del Río Portilla, Y., Corsi-Cabrera M., Microarquitectura de la actividad EEG del sueño paradójico fasico y tonico en el hombre. *XLV Congreso Nacional de Ciencias Fisiológicas*. Colima, Mexico, 2002.

del Río-Portilla Y., Muñoz-Torres Z., Guevara M. A., Corsi-Cabrera M., Actividad oscilatoria durante el sueño paradójico: Organización en bandas. *XLV Congreso Nacional de Ciencias Fisiológicas*. Colima, Mexico, 2002.

Lectures:

Scientific Audience

- 2011, July Correlatos neurales del seguimiento de reglas complejas bajo el efecto del diazepam (*Neural correlates of rule-guided behavior under diazepam effects*), *Universidad Autonoma Metropolitana*, Mexico City.
- 2009, September Sueño y Funciones Cerebrales Superiores (*Superior brain functions and sleep*), *Instituto Nacional de Pediatría*, Mexico City.
- 2009, August Sueño y Sistema Limbico (*Limbic system and sleep*), *Instituto Nacional de Psiquiatría*, Mexico City.
- 2006, February Memoria y Cerebro (*Memory and the brain*), *Asociacion Medica del Hospital de Mexico, A.C.*, Mexico City.
- 2005, May El Cerebro Adicto (*The addicted brain*), Grupo Psinapsis. *Centro Universitario Cultural, A.C.*, Mexico City.

Lay Audience

- 2005, March ¿Duerme mi cerebro cuando duermo? (*Does my brain is sleeping while I sleep?*), *Brain Awareness Week, SfN*, Mexico City.
- El Cerebro Adicto (*The addicted brain*), Grupo Psinapsis. *Brain Awareness Week, SfN*, Mexico City.

Organization of Specialized Courses & Workshops:

- 2008, May Simposium Internacional de Neuroimagen y Neuropsiquiatria. UNAM, Mexico City.
- 2001, February IX Congreso Mexicano de Psicología. Centro Medico Siglo XXI, Mexico City.
- 2000, September International Meeting: NEURO-Funcional e Invasión Mínima. Instituto Nacional de Neurología y Neurocirugía, Mexico City.
- 2004, July Workshop “Drogadicción” Grupo Psinapsis. Universidad Autónoma del Estado de México. México.

Research Internships:

Ospedale privato Santa Viola, Bologna, Italy. March - May, 2013.

University Institute in Mental Health, Douglas Hospital, McGill University, Montreal, Canada. September - December, 2007. Advisor: **Dr. Jorge Armony.**

Teaching Experience:

Principal Instructor

2011-2012: Neurocognition (*Neurocognition*) Undergraduate, Dept. of Psychology, Universidad Chapultepec, Mexico City.

Taller de Psicofisiología (*Psychophysiology Workshop*) Undergraduate, Dept. of Psychology, Universidad Chapultepec, Mexico City.

2010-2012: Bases Biológicas de la Conducta (*Biological Basis of Behavior*) Undergraduate, Dept. of Psychology, Universidad Chapultepec, Mexico City.

2010: Psicofisiología del Sueño (*Psychophysiology of Sleep*) Undergraduate, Dept. of Psychology, Universidad Chapultepec, Mexico City.

Psicofisiología del Sueño Laboratorio (*Psychophysiology of Sleep Laboratory*) Undergraduate, Dept. of Psychology, Universidad Chapultepec, Mexico City.

Teaching Assistant

2005: Modulo: Sistema Visual (*Topic: Visual System*) Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

Modulo: Metodos en Neurociencias (*Topic: Methods in Neuroscience*) Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

Modulo: Estres (**Topic: Stress**) Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

2004: Modulo: Anatomia del Sistema Nervioso (**Topic: Nervous System Anatomy**) Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

Modulo: Farmacologia Conductual (**Topic: Behavioral Pharmacology**) Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

2002: Modulo: Audicion (**Topic: Audition**) co-taught with Bs. Gabriela Orozco, Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

Modulo: Anatomia General del Sistema Nervioso (**Topic: General Anatomy of the Nervous System**) Undergraduate, Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

Thesis direction

2012-present: “Efectos cognoscitivos del cambio del turno laboral en mujeres” Gisela Martínez Yañez, B.A. in Psychology, Universidad Chapultepec.

Other

2009: Mentoring undergraduate students in research development. Dept. of Psychology, National Autonomous University of Mexico, Mexico City.

Specialized Courses Attended:

2015: The Data Scientist’s Toolbox, Johns Hopkins University, Coursera.

2014: Recent Developments in Brain Signal Analysis, Mexico.

2013: 17th EEGLAB workshop, USA.

2010: *3rd. International Course for Sleep Medicine*, Mexico.

2009: *Neurobiology of Adictions*, Mexico.

2008: The role of sleep in memory and learning, USA.

2007: Methods in neuroimaging, Canada.

2006: *Contributions of functional neuroimaging to normal and pathological*

- language processes, Mexico.*
- 2004: *Analyses of bioelectric signals, Mexico.*
Neuroscience update, Mexico.
- 2003: *Neuropharmacology and experimental therapeutics, Mexico.*
Neurobiology of memory and attention, Mexico.
Stereotactic radiosurgery and radiotherapy, and international satellite symposium of fMRI, Mexico.
- 2002-2003: *Neuroscience applied to neurological patients, Mexico.*
- 2002: *Biochemistry of emotion, Mexico.*
- 2001-2002: *Pharmacobiology of adiction, Mexico.*
- 2001: *II National congress of residents in neuroscience, Mexico.*
Neuroscience update, Mexico.
Early childhood intervention, Mexico.
- 2000: *Meeting of neuroscience 2000, Mexico.*
Superior brain functions, Mexico.
Nervous damage, functional recovery and brain plasticity in neurology rehabilitation, Mexico.
- 1999: *National congress of sleep, Mexico.*
Functional neuroanatomy, Mexico.
Training in epilepsy, Mexico.
Ist International course of respiration and sleep, Mexico.
- 1998: *Strategies in bibliographic search, Mexico.*

Research Diffusion Activities:

- 2010, October Sleep Laboratory Tour, Faculty of Psychology, National Autonomous University of Mexico. Universidad del Valle de Mexico.
- 2008, March Poster presentation, Faculty of Psychology, UNAM “Brain Awareness Week”

Neurosciences Research Laboratory Tour, Faculty of Psychology, UNAM. “Brain Awareness Week”
- 2007, March Poster presentation, Faculty of Psychology, UNAM “Brain Awareness Week”

2006, March Poster presentation, Faculty of Psychology, UNAM “Brain Awareness Week”

2006, March Neuroscience Research Laboratories Tour, Faculty of Psychology, UNAM. “Brain Awareness Week”

Radio

2007, March “El sueño y la ciencia” Radio Sinapsis, Autonomous University of Queretaro – Neurobiology Institute, UNAM.

“Patologías del sueño” Radio Sinapsis, Autonomous University of Queretaro – Neurobiology Institute, UNAM.

Scientific Organization Membership:

Cognitive Neuroscience Society, 2009.

International Brain Research Organization Society, 2008.

Sociedad Mexicana de Ciencias Fisiológicas, 2006.

Society for Neuroscience, 2003.