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**BIOGRAPHICAL SKETCH**

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**NAME: Jose R. Eguibar**

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eRA COMMONS USER NAME (credential, e.g., agency login): **Jose**

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POSITION TITLE: Research Director, VIEP, Benemérita Universidad Autónoma de Puebla.

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**EDUCATION/TRAINING**

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INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Faculty of Medicine, Universidad Autónoma de Puebla	M.D.	07/1985	Medical Doctor
Master in Physiological Sciences, Institute of Physiology, Benemérita Universidad Autónoma de Puebla	M. Sc.	02/1988	Physiological Sciences
Department of Physiology, Biophysics and Neuroscience, CINVESTAV, México	Ph. D.	06/1998	Neuroscience

**RESEARCH AND PROFESSIONAL EXPERIENCE****A. Personal Statement**

My main line of research has been used different behavioral and electrophysiological approaches to record different mental illnesses in murine bio models. In fact, we obtain by strict inbreeding process to sublimes from Sprague-Dawley rats which differ in their spontaneous yawning frequency called high-yawning /HY) with a mean of 20yawns/h and the low-yawning (LY) with just 2 yawns/h, that means one order of magnitude of difference. Interestingly, HY male rats are resilient to several stresses and the LY are more anxious when tested in the elevated plus maze, open field arena or in the white-black compartment box. Recently, we studied the acute addiction to alcohol and the LY male rats ingested more alcohol with respect to HY and the changes in the sleep-wake indicate that LY are an adequate animal model of an anxious state. We are in the process to analyze other addictions in these two sublimes of Sprague-Dawley. Additionally, we also did a detail analysis of the behavior and electrophysiological characteristic of the myelin mutant *taiep* rats. *Taiep* is the acronym of the motor syndrome of these animals: tremor, ataxia, immobility episodes, epilepsy and paralysis along the first year of life. Recently, we clearly demonstrated that these rats had the same brain alterations measured through MRI as the human leukodystrophy: Hypomyelination wit atrophy of the basal ganglia and cerebellum (H-ABC). In fact, in both humans and *taiep* rats the reason is a point mutation in the tubulin  $\beta$  4A (TUBB4A) that affect only the oligodendrocytes in the central nervous system. The availability of this murine model wit a life

expectancy of normal rats (around 24 months) allow us to analyze several treatment approaches. Another important aspect is that female *taiep* rats had ovary changes that are like the so-called ovary leukodystrophy. (see references list).

1. Follicular development and secretion of ovarian hormones during the juvenile and adult reproductive lives of the myelin mutant *taiep* rat: an animal model of demyelinating diseases. Muñoz-de-la-Torre L.P, Eguibar J. R., Cortés C., Ugarte A., Trujillo A. *International Journal of Endocrinology*. Volume 2018, Article ID 5718782, 11 pages. <https://doi.org/10.1155/2018/5718782>.

2.- Yawning and penile erection frequencies are resilient to maternal care manipulation in the high-yawning subline of Sprague-Dawley rats. Dorantes-Nieto María de los Ángeles, Cortés Carmen, Trujillo Angélica, Ugarte A. and Eguibar José R. *Frontiers in Behavioral Neuroscience*. 2020. 14: 20, 14 pages. doi: 10.3389/fnbeh.2020.00020

3.- MRI features in a murine model of TUBB4A tubulinopathy. Ángeles Garduno-Robles, Milvia Alata, Valeria Piazza, Carmen Cortes, Jose R. Eguibar, Sergio Pantano and Víctor H. Hernandez. *Frontiers in Neuroscience*, Vol. 14, Article 555, 12 pages. April 2020. <https://doi.org/10.3389/fnins.2020.00555>

4.- Changes in long-term taste memory in high- and low-yawning rats versus outbred Sprague-Dawley rats: Differential latent inhibition effects after prolonged sugar consumption. María-Isabel Miranda, Alejandro Rangel-Hernández, Gabriela Vera-Rivera, Carmen Cortés, and Jose R. Eguibar. *Animal Cognition July issue*: 12 pages. 2020. <https://doi.org/10.1007/s10071-020-01415-x>

5.- The myelin mutant *taiep* rat has a differential immune response related to protection against the infection with the human parasite *Trichinella spiralis*. Jorge Morales Montor, Hugo Aguilar-Díaz, Jose R Eguibar, Karen Nava-Castro, Carmen Cortes, Víctor Hugo Del Río-Araiza, Romel Hernández-Bello. *PLoS ONE 15(8)*: e0231803, 16 pages. <https://doi.org/10.1371/journal.pone.0231803>.

6.- Auditory impairment in H-ABC tubulinopathy. Lopez-Juarez A, Vega AG, Kleinert-A A, Piazza, V, Garduno-Robles A, Alata M, Villaseñor-Mora C, Eguibar JR, Cortes C, Padierna C, Hernández VH. *Journal of Comparative Neurology*, 2020; pages 1–12. <https://doi.org/10.1002/cne.24990>

## **B. Positions and Honors**

1) Prize to Academic Merit to the best scientist in Puebla State under 40 years. University Foundation 2001.

2) Member of the National Research System since 1988 until 2021. Level 3 since 2012.

3) President of the Mexican Society for Physiological Sciences (SMCF) period 2005-2007.

4) President of de Academia de Investigación en Biología de la Reproducción A.C. period 2011-2013

5) Recognized as a Distinguished Professor from Secretaría de Educación Pública: from 2003 until 2021.

6) Puebla Prize for the best Scientific in Medical Sciences field 2004.

Gobierno del Estado de Puebla y Consejo Estatal de Ciencia y Tecnología.

7) Member of the Mexican Academy of Sciences, since 2001.

8) Member of the Latin-American, American Association of Sleep and the World Federation of Sleep Research Societies

9) Member of the National Academy of Medicine, since 2009.

10) Member of the Study Section of Sistema Nacional de Investigadores period 2018-2020.

1988-present Member of the Sociedad Mexicana de Ciencias Fisiológicas.

1991-present Member of the Society for Neuroscience (1991). Member number 000152745.

1994-present Member of the International Brain Research Organization I.B.R.O.

1996-present Member of the American Association for the Advancement of Science.

1996-present Member of the New York Academy of Sciences (1996).

1997-present Member of the Sociedad Latinoamericana del Sueño.

1997-present Member of the World Federation of Sleep Research Societies.

2001-present Member of the Academia Mexicana de Ciencias.

2004-present Member of the Sociedad Mexicana de Historia y Filosofía de la Medicina A.C.  
Miembro de la American Academy of Sleep Medicine. Member number 205288. Desde 2006  
2008-present Member of the Academia de Investigación en Biología de la Reproducción A.C. (AIBIR).  
2009-present Member of the Academia Nacional de Medicina.  
2011-present Member of the Society for Behavioral Neuroendocrinology.  
2013-present Member of the Sociedad Mexicana de Neuroinmunoendocrinología.  
2013-present Member of the American Epilepsy Society, Member number 543153, desde 2013  
Note: I reviewed more than 30 manuscripts for scientific journals in the last five years.

## C. Contribution to Science

### C.1. Regulation of yawning and grooming:

My first contribution to science was the detail analysis of the environmental influences on yawning behavior. Due to the HY rats we are able to demonstrate that yawning behavior had a circadian oscillation. It is possible that yawning had a free running under constant light conditions and that restricted food scheduled act as a synchronizer of anticipatory peak of this innate motor pattern. The exposition of a mild stressor also produce an anticipatory peak of yawning due to expectancy. Additionally, we demonstrated that several yawning inducers such as central administration of oxytocin or adrenocorticotrophic (ACTH) hormones induced more yawning and grooming in HY with respect to LY male rats . With a similar pattern systemic administration muscarinic or dopaminergic D<sub>2</sub>-like agonists in HY

1. Dopaminergic D<sub>2</sub>-like agonists produce yawning in the myelin mutant *taiep* and Sprague-Dawley rats. Jose R. Eguibar, Ma. del Carmen Cortés, Manuel Lara-Lozano and Diana M. Mendiola. *Pharmacology, Biochemistry and Behavior* 102: 118-123, 2012. AC. DOI: 10.1016/j.pbb.2012.03.020
2. The central administration of oxytocin differentially increased yawning, grooming, and scratching in high- (HY) and low-yawning (LY) sublines of Sprague-Dawley rats. Eguibar J.R., Díaz-Romero M., and Ugarte A. *Pharmacology, Biochemistry and Behavior* 2015. 134: 6-11. AC. doi: 10.1016/j.pbb.2015.04.009
3. Yawning reduces facial temperature in the high-yawning subline of Sprague-Dawley rats. Jose R. Eguibar Carlos A. Uribe, Carmen Cortes, Amando Bautista, Andrew C. Gallup. *BioMed Central Neuroscience* 2017. 18:3, 8 páginas. DOI: 10.1186/s12868-016-0330-3.
4. Thermal imaging reveals sizable shifts in facial temperature surrounding yawning in budgerigars (*Melopsittacus undulatus*). Andrew C. Gallup, Elaine Herron, Janine Militello, Lexington Swartwood, Carmen Cortes and Jose R. Eguibar. *Temperature* 4: 429-435. 3 Nov 2017. <https://doi.org/10.1080/23328940.2017.1373896>
5. Yawning and penile erection frequencies are resilient to maternal care manipulation in the high-yawning subline of Sprague-Dawley rats. Dorantes-Nieto María de los Ángeles, Cortés Carmen, Trujillo Angélica, Ugarte A. and Eguibar José R. *Frontiers in Behavioral Neuroscience*. 2020. 14: 20, 14 páginas. doi: 10.3389/fnbeh.2020.00020.

### C.2. Experimental analysis of copulatory behavior:

As indicated in my Personal Statement I have been part of a large group of researchers involved in the analysis of male and female sexual behavior in rats with different backgrounds through the Research Academy of Reproductive Biology in México and Society for Behavioral neuroendocrinology in USA. HY male rates had a disorganized male sexual pattern with more sexual bouts and longer interintromission that delayed the ejaculation. When the newborns where cross-fostered with Sprague-Dawley dams the HY improve their sexual pattern. The opposite happen when newborn Sprague-

Dawley male rats were raised by HY dams, male sexual behavior decrease in these male Sprague-Dawley rats in young adulthood. This is a quite important aspect because in human male copulatory differ among men. When analyzed large population there is a Gaussian distribution in the ejaculatory latency that means a precocious (premature), sluggish, mean and delayed ejaculation. In male rats there is a similar pattern from precocious to delayed ejaculators and these animals are a useful tool to analyze the possible pharmacological treatments, particularly in both tails of the curve.

**C.3. Analysis leukodystrophy in humans and the rat model *taiep*:**

Another neurological research that we are doing is the use of *taiep* rats as the only available model of human leukodystrophy called hypomyelination with atrophy of the basal ganglia and cerebellum (H-ABC). It is relevant that human and *taiep* rats had similar pattern of affection in the CNS using MRI imagenology, also is the case with several modalities of evoked potentials including auditory, visual and somatosensory. In both humans and rats the main cause is due to a point mutation in the  $\beta$  tubulin 4A (TUBB4A) that affect mainly the oligodendrocytes and the myelin formation and maintenance. We are trying to recruit more patients and try to convince neurologists and psychiatrist about this disease. In fact, our oral presentation in the recent meeting of the Mexican Neurological Society was recognized as the best work. We are testing several drugs on stepping and ataxia in this mutant and this allow us to discern which drugs of mixture of drugs could help more efficient and with long term in order to be able to did translational medicine for clinical trails in humans.

**D. Research Support:**

**COMPLETED**

**40 Scientific projects with funding from different resources**

**ACTIVE**

<p>“Determinación del perfil reproductivo y del desempeño sexual y maternal en las sublíneas HY y LY y compararlo con las Sprague-Dawley”. Cuerpo Académico: Neuroendocrinología CLAVE BUAP-CA-288. Instituto de Fisiología, Benemérita Universidad Autónoma de Puebla. Secretaría de Educación Pública a través del PRODEP.</p>	<p>09/23/2015 - 09/31/2018 \$245,000</p>	<p>1.02 calendar</p>
<p>“Las ratas de alto bostezo HY como un modelo de ansiedad-depresión, rol del cuidado maternal y el estado nutricional”. Vicerrectoría de Investigación y Estudios de Posgrado, Benemérita Universidad Autónoma de Puebla. DES del área de la Salud.</p>	<p>03/01/2017 – 12(31/2020 120,000</p>	<p>1.57</p>

<i>“Estudio de los efectos de las mutaciones de tubulinas en pacientes humanos y en un modelo animal: del laboratorio a la investigación traslacional”</i> Proyecto de Ciencia de Frontera No. 194171. Proyecto de grupo con la Universidad de Guanajuato and Benemérita Universidad Autónoma de Puebla	11/30/2020 - 12/31/2022 \$3,000,000	1.68 calendar
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