

**ARTURO ANDRADE, PhD**

Assistant Professor of Brain Science (Research)

Department of Neuroscience (Research)

Robert J. & Nancy D. Carney Institute for Brain Science

Brown University

164 Angell St, Providence, RI. 02906

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## A. EDUCATION

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- 2004-2008     *Ph.D. in Cellular and Molecular Neurobiology*. Center for Research and Advanced Studies of the National Polytechnic Institute, Department of Physiology, Biophysics and Neurosciences. Mexico City, Mexico.  
Thesis title: Structure-function studies in  $\text{Ca}_v\alpha_2\delta-1$  subunit of voltage-gated calcium channels. Advisor: Ricardo Felix.
- 2002-2004     *M.Sc. in Cellular and Molecular Neurobiology*. Center for Research and Advanced Studies of the National Polytechnic Institute, Department of Physiology, Biophysics and Neurosciences. Mexico City, Mexico.  
Thesis title: Functional characterization in mutants in posttranslational sites of  $\text{Ca}_v\alpha_2\delta-1$  subunit of voltage-gated calcium channels. Advisor: Ricardo Felix.
- 1996-2001     *B.Sc. University of Michoacan, School of Chemistry, Pharmacy and Biology*. Morelia, Michoacan, Mexico.  
Measuring antioxidant levels in local populations of Michoacan using superoxide dismutase and catalase.  
Advisor: Rosalio Mercado/Victor Manuel Lopez

## B. POST-GRADUATE TRAINING

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- 2008-2015     Postdoctoral Research Associate. Department of Neuroscience, Brown University, Providence, RI.  
Advisor: Diane Lipscombe.

## C. HONORS/AWARDS

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- 2021             Outstanding Advisor Award. University of New Hampshire.
- 2008- present   National Network of Investigators, Category I. National Council of Research and Technology, Mexico  
-Granted to the top 25% researchers in Mexico.
- 1996-2001     Miguel Hidalgo Award to Academic Merit. University of Michoacan, Morelia, Mexico.  
-Granted to the top 1% students.

|           |                                                                                            |
|-----------|--------------------------------------------------------------------------------------------|
| 2002-2008 | Graduate Fellowship. National Council of Research and Technology, Mexico                   |
| 2000-2007 | Telmex Foundation Award. Telmex Foundation.<br>-Granted to the top 10% students in Mexico. |
| 2000      | University of Michoacan Award in Academic Achievement, Mexico                              |

#### **D. ACADEMIC APPOINTMENTS**

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|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2021-present | Assistant Professor of Brain Science (Research). Robert J. & Nancy D. Carney Institute for Brain Science. Brown University. Providence, RI. USA.                               |
| 2021-present | Assistant Professor of Neuroscience (Research). Department of Neuroscience. Brown University. Providence, RI. USA.                                                             |
| 2015-2021    | Assistant Professor of Neurobiology (tenure track). Department of Biological Sciences, College of Life Sciences and Agriculture, University of New Hampshire. Durham, NH. USA. |
| 2000-2001    | Undergraduate Research Assistant in the Natural Products Laboratory, School of Chemistry, Pharmacy and Biology. University of Michoacan, Morelia, Michoacan. Mexico.           |
| 1999, 2000   | Undergraduate Summer Research Assistant at the Natural Products Laboratory, School of Chemistry, Pharmacy and Biology. University of Michoacan, Morelia, Michoacan. Mexico.    |
| 1998         | Undergraduate Summer Research Assistant at the Western Biomedical Research Center, Mexican Institute for Social Security, Puebla, Puebla. Mexico.                              |

#### **E. HOSPITAL APPOINTMENTS**

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N/A

#### **F. OTHER APPOINTMENTS**

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|              |                                                                                                                                                          |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2022         | Ad hoc Grant Reviewer for Pathophysiology of Mental Disorders and Addiction (PMDA), National Institute of Health.                                        |
| 2021         | Ad hoc Grant Reviewer for the Doctoral Fellowship Program of the Austrian Academy of Sciences                                                            |
| 2021         | Ad hoc Grant Reviewer for the French National Research Agency                                                                                            |
| 2018         | Ad hoc Grant Reviewer for Tirol Foundation (Austria)                                                                                                     |
| 2016         | Ad hoc Grant Reviewer for study section Molecular Neuropharmacology and Signaling (MNPS), National Institute of Health.                                  |
| 2012-2015    | Postdoctoral Liaison, Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), Brown University Chapter, Providence, RI         |
| 2008-present | Ad hoc Grant Reviewer for the National Council of Science and Technology (Mexican equivalent of U.S. National Institutes of Health), Mexico City, Mexico |

## G. HOSPITAL COMMITTEES

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N/A

## H. UNIVERSITY COMMITTEES

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|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2022         | Animal Care Governance Committee                                                                                                                                         |
| 2020         | Graduate Admissions Coordinator. Department of Biological Sciences, University of New Hampshire.                                                                         |
| 2020-present | NSF CAREER Academy<br>-Series of workshops to help faculty to submit a Faculty Early Career Development Program from the National Science Foundation (NSF CAREER) grant. |
| 2020-present | Graduate Program Committee at the Department of Biological Sciences, University of New Hampshire.                                                                        |
| 2017-present | Academic Advisor for the National Honor Society in Neuroscience, NuRhoPsi, University of New Hampshire Chapter.                                                          |
| 2015-2020    | Doctoral thesis committee member (8 committees) at the University of New Hampshire.                                                                                      |
| 2019-2020    | Up2NIH<br>-Series of workshops to help faculty to submit NIH grants, University of New Hampshire.                                                                        |
| 2019-2020    | Search committee for two tenure-track faculty at the Department of Biological Sciences, University of New Hampshire.                                                     |
| 2019-2020    | Dissertation Year Fellowship Committee, University of New Hampshire.<br>-This committee recommends summer funding for graduate students in their last year.              |
| 2019         | Development of an interdepartmental and interinstitutional neuroscience and behavior graduate program (University of New Hampshire and University of New England).       |
| 2017-2019    | Ad hoc committee to revise departmental bylaws, Department of Biological Sciences, University of New Hampshire.                                                          |
| 2016-2019    | Faculty liaison for the Hamel Undergraduate Center at the University of New Hampshire, which coordinates undergraduate funding.                                          |
| 2016-2021    | Advisory committee for McNair Research Program, University of New Hampshire.<br>-Provides mentorship and funding for undergraduates from underrepresented backgrounds.   |
| 2016-2019    | Voting member of the Institutional Animal Care and Use Committee (IACUC), University of New Hampshire.                                                                   |
| 2017         | Search committee for department chair at the Department of Biological Sciences, University of New Hampshire.                                                             |
| 2016         | Research Engagement Academy.<br>-Series of workshops on grantsmanship at the University of New Hampshire.                                                                |
| 2016         | Judge for the Undergraduate Research Conference at the University of New Hampshire.                                                                                      |
| 2016         | Instructor for the SMART project, University of New Hampshire.<br>-Series of activities to recruit high school students to STEM education                                |

## I. MEMBERSHIP IN SOCIETIES

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2006-present Society for Neuroscience. Member.

2010-present Society for the Advancement of Chicanos and Native Americans in Science. Member.

## J. PUBLICATIONS

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### *Peer-reviewed publications*

+ and • Indicates graduate and undergraduate students trained in the Andrade Lab, respectively.

1. Bunda A+, **Andrade A** (2022) BaseScope<sup>TM</sup> approach to visualize alternative splice variants in tissue. *Methods in Molecular Biology*. Springer.
2. Berry C+, Tkachev V•, MacKenzie Forest•, Radjahyaksha A, **Andrade A** (2022) Novel insights into the role of voltage-gated calcium channel genes in psychiatric disorders. *Springer*.
3. Hwang H, Szucs M, Ding L, Allen A, Haengen H, Gao F, **Andrade A**, Pan J, Carr S, Ahmad R, Xu W (2021) A schizophrenia risk gene, NRG1, bidirectionally modulates synaptic plasticity via regulating the neuronal phosphoproteome. *Biological Psychiatry*.
4. Blazon M+, LaCarubba B+, Bunda A, Czepiel N•, Mallat L+, Londrigan L•, **Andrade A** (2021) N-type calcium channels control GABAergic transmission in brain areas related to fear and anxiety. *OBM Neurobiol* 5(1).
5. Bunda A\*+, LaCarubba B\*+, Akiki M•, **Andrade A**. (2019) Tissue and cell-type specific expression of a splice variant in the II-III cytoplasmic loop of Cav2.2 mRNA. *FEBSOpenBio*. 9 (9) 1603-1616. PMID 31314171 \*Joint first authors.
6. Bunda A+, LaCarubba B+, Bertolino M•, Akiki M•, Bath K, Lopez-Soto J, Lipscombe D, **Andrade A**. (2019) Calcium channel composition is linked to behavioral responses to aversive stimuli. *Molecular Brain*. 12 (1) 1-14. PMID 31630675.
7. Allen SE\*, Toro CP\*, **Andrade A\***, Lopez-Soto J, Lipscombe D. (2017) Cell-specific RNA binding protein Rbfox2 regulates Cav2.2 mRNA exon composition and overall current size. *e-Neuro*. 4(5). <https://doi.org/10.1523/ENEURO.0332-16.2017>. PMID 29067356 \*Joint first authors.
8. Sandoval A, Duran P, Gandini MA, Castillo V, **Andrade A**, Felix R (2017) Regulation of Cav1.3 channels by the cGMP-PKG signaling pathway. *Cell Calcium*. (66) 1-9. PMID 28807144
9. **Andrade A**, Hope J, Allen A, Yorgan V, Lipscombe D\*, Pan, JQ\*. (2016) A rare schizophrenia risk variation in *CACNA1I* disrupts surface expression of Cav3.3 Calcium Channels. *Scientific Reports*. PMID 27756899.
10. Groen\*, JL **Andrade\*** A, Ritz K, Jalalzadeh H, Haagmans M, Bradley TE, Jongejan A, Verbeek DS, Nürnberg P, Denome S, Hennekam RC, Lipscombe\* D, Baas\* F, Tijssen\* MA (2015) *CACNA1B* mutation is linked to unique

- myoclonus-dystonia syndrome. *Hum Mol Genet.* Feb 15; 24(4): 987-93. PMID: 25296916. \* Joint first and last authors.
11. Jiang\* Y, **Andrade\*** A, Lipscombe D (2013). Spinal morphine but not ziconotide or gabapentin analgesia is affected by alternative splicing of voltage-gated calcium channel Cav2.2 pre-mRNA. *Mol Pain.* Dec 26; 9:67. PMID: 24369063. \* Joint first authors.
  12. Marangoudakis S, **Andrade** A, Helton TD, Denome S, Castiglioni AJ, Lipscombe D. (2012) Differential ubiquitination and proteasome regulation of Cav2.2 N-type channel splice isoforms. *J Neurosci.* Jul 25;32(30):10365-9. PMID: 22836269.
  13. **Andrade\*** A, Calderón-Rivera\* A, Hernández-Hernández O, González-Ramírez R, Sandoval A, Rivera M, Gomora JC, Felix R. (2012) Identification of a disulfide bridge essential for structure and function of the voltage-gated  $\alpha_2\delta$ -1 auxiliary subunit. *Cell Calcium.* Jan;51(1):22-30. PMID: 22054663. \* Joint first authors.
  14. **Andrade\*** A, Denome\* S, Jiang Y, Marangoudakis S, Lipscombe D. (2010) Opioid inhibition of N-type  $\text{Ca}^{2+}$  channels and spinal analgesia couple to alternative splicing. *Nat Neurosci.* 13, 1249-1256. PMID: 20852623. \* Joint first authors.
  15. **Andrade** A, Sandoval A, Lipscombe D, Campbell KP, Felix R. (2009) The  $\alpha_2\delta$  subunit augments expression and modifies the pharmacology of Cav1.3 L-type channels. *Cell Calcium.* 46, 282-92. PMID: 19796812.
  16. Castro A, **Andrade** A, Vergara P, Segovia J, Aguilar J, Felix R, Delgado-Lezama R. (2009) Involvement of R-type  $\text{Ca}^{2+}$  channels in neurotransmitter release from spinal dorsolateral funiculus terminals synapsing motoneurons. *J Comp Neurol.* 513, 188-196. PMID: 19127523.
  17. Barajas M, **Andrade** A, Hernandez-Hernandez O, Felix R, Arias-Montaña JA. (2008) Histamine-induced  $\text{Ca}^{2+}$  entry in human astrocytoma U373 MG cells: evidence for involvement of store-operated channels. *J Neurosci Res* 86, 3456-3468. PMID: 18627030
  18. **Andrade\*** A, Bermudez de León\* M, Cisneros B, Felix R. (2007) Myotonic dystrophy CTG repeat expansion alters  $\text{Ca}^{2+}$  calcium channel functional expression in PC12 cells. *FEBS lett* 581, 4430-4438. PMID: 17719582. \* Joint first authors.
  19. Sandoval A, **Andrade** A, Beedle AM, Campbell KP, Felix R. (2007) Inhibition of recombinant N-type Cav channels by the  $\gamma 2$  subunit involves unfolded protein response (UPR)-dependent and UPR-independent mechanisms. *J Neurosci* 27, 3317-3327. PMID: 17376992.
  20. **Andrade** A, Sandoval A, Oviedo N, De Waard M, Elias D, Felix R. (2007) Proteolytic cleavage of the voltage-gated  $\text{Ca}^{2+}$  channel  $\alpha_2\delta$  subunit: structural and functional features. *Eur J Neurosci.* 25,1705-1710. PMID: 17408426.
  21. Avila T, **Andrade** A, Felix R. (2006) Transforming growth factor- $\beta 1$  and bone morphogenetic protein-2 downregulate Cav3.1 channel expression in mouse C2C12 myoblasts. *J Cell Physiol* 209, 448-456. PMID: 16883604.
  22. Sandoval A, Oviedo N, **Andrade** A, Felix R. (2004) Glycosylation of asparagines 136 and 184 is necessary for the  $\alpha_2\delta$  subunit-mediated regulation of voltage-gated  $\text{Ca}^{2+}$  channels. *FEBS Lett* 576, 21-26. PMID: 15474003.

#### **Other peer-reviewed publications**

1. **Andrade A\***, Mallat S+, Brennecke A+, Gomez-Rivadeneira J•, Brown J•, Czepiel N•, Londringan L•. (2019) Genetic links between voltage-gated calcium channels and mental illness. *International Journal of Molecular Sciences*. 20 (14) 3537 PMID 31331039 \*Corresponding author.
2. Lipscombe D, **Andrade A**. (2015) Calcium channel Cav $\alpha_1$  splice isoforms: Tissue-specificity and drug action. *Curr Mol Pharmacol*. 8 (1) 22-31. PMID: 25966698
3. Felix R, Calderon-Rivera A, **Andrade A** (2013) Regulation of high-voltage-activated Ca<sup>2+</sup> channel function, trafficking and membrane stability by auxiliary subunits. *WIREs Membrane Transport and Signaling*. 2:207-220. PMID: 24949251.
4. Lipscombe D, **Andrade A**, Allen SE. (2013) Alternative splicing: functional diversity among voltage-gated calcium channels and behavioral consequences. *Biochim Biophys Acta*. Jul;1828(7):1522-9. PubMed PMID: 23022282.

#### ***Non-peer-reviewed publications***

1. LaCarubba B+, Bunda A+, Savage K•, Sargent H•, Akiki M•, Foxall T, **Andrade A**. (2019) Developmental and cell-specific expression of *Cacna1d* splice variants. *BioRxiv*. <https://doi.org/10.1101/598722>
2. Tepper Z\*•, Panesar S\*•, LaCarubba B+, **Andrade A**. (2017) Characterization of cholecystokinin expressing neurons in sensory areas of trigeminal nucleus and spinal cord. *Inquiry*. \*Joint first authors. [https://scholars.unh.edu/inquiry\\_2017/12/](https://scholars.unh.edu/inquiry_2017/12/)

#### ***Publications submitted or in preparation***

1. Brennecke A+, Bunda A+, Mallat S+, Czepiel N•, Kahoe L•, Bertolino M•, LaCarubba B+, Bradford A+, **Andrade A** (2021). *Cacna1b* alternative splicing is implicated in behavioral responses to stress. *Neuronal Signaling*.
2. Mulhern D•, Monahan A•, **Andrade A** (2021) Implications of alternative splicing in psychiatric disorders. *Neuronal Signaling*.
3. Castro-Junior C\*, Vinicius-Gomez M, Nascimento Cordeiro M, Borges Helena M, Lipscombe D, **Andrade A** (2021)  $\omega$ -Phenotoxins inhibit voltage-gated calcium Cav2.2 ion channel splice isoforms of dorsal root ganglia.
4. Trachtenberg L+, **Andrade A\***, Bolker J\* (2021) Using human data to improve the use of animal models to elucidate the neurobiology of complex behavioral traits.

#### **K. ABSTRACTS**

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1. **Andrade A**, Bunda A, LaCarubba B. Akiki M. Detection of a *Cacna1b* (CaV2.2) splice variant in brain tissue. Society for Neuroscience, Chicago, IL. (Poster).
2. LaCarubba B, Bunda A, Foxall T, **Andrade A**. (2017) Tissue-specific and developmental regulation of Cav1.3 splice isoforms in the I-II linker. Society for Neuroscience, Washington, DC. (Poster).

3. Bunda A, LaCarubba B, **Andrade A.** (2017) Alternative splicing of Cav2.2 pre-mRNA influences fear conditioning in females. Society for Neuroscience, Washington, DC. (Poster).
4. Sandoval A, Duran P, Gandini MA, Castillo V, **Andrade A**, Felix R. (2016) Regulation of Cav1.3 channels by the cGMP-PKG signaling pathway. Society for Neuroscience, San Diego, CA. (Poster).
5. **Andrade A**, Groen J, Ritz K, Haagmans M, Bradley T, Jalalzadeh H, Nuernberg P, Baas F, Verbeek D, Tijssen M, Denome S, Lipscombe D. (2014) Single channel and whole cell analysis of an exonic mutation in human *CACNA1B* linked to Myoclonus Dystonia syndrome. Society for Neuroscience. Washington, DC. (Poster).
6. Pan J, **Andrade A**, Allen A, Hope J, Lipscombe D. (2014) Functional analyses of human Cav3.3 calcium channel variants corresponding to rare disruptive mutations in *CACNA1I* in schizophrenia. Society for Neuroscience. Washington, DC. (Poster).
7. **Andrade A**, Allen S, Toro C, Raingo J, Lipscombe D (2013) Voltage-Gated Calcium Channel Splice Variants In Sympathetic Neurons. Annual SACNAS National Conference. San Antonio, TX. (Poster)
8. **Andrade A**, Patel K, Hart AC, Lipscombe D (2013) Alternatively spliced exons in *Caenorhabditis elegans* egl-19, gene encoding Cav1-like channels. Society for Neuroscience. San Diego, CA. (Poster)
9. **Andrade A**, Bath K, Denome S, Lipscombe D. (2012) Cav2.2 splice isoforms of the *Cacna1b* gene are implicated in anxiety-like behavior. Annual SACNAS National Conference. Seattle, WA. (Poster)
10. **Andrade A**, Bath K, Denome S, Lipscombe D. (2012) Cav2.2 splice isoforms of the *Cacna1b* gene are implicated in anxiety-like behavior. FASEB meeting. Snowmass, Colorado. (Poster)
11. Webster KM, **Andrade A**, Lipscombe D (2012) CNS-specific isoforms of the calcium channel CACNA1C gene regulated by Nova-2. Society for Neuroscience. New Orleans, LA. (Poster)
12. Calderón-Rivera A, **Andrade A**, Hernández-Hernández O, González-Ramírez R, Sandoval A, Rivera M, Gomora JC, Felix R (2011) Identification of two Cys residues essential for disulfide bonding and biological activity of the voltage gated calcium channel  $\alpha_2\delta$ -1 auxiliary subunit. Society for Neuroscience. Washington, D.C. (Poster)
13. **Andrade A**, Bath K, Burwell R, Denome S, Lipscombe D (2011) Exon-replacement in the mouse *Cacna1b* gene reveals CNS involvement of N-type calcium channel splicing. Society for Neuroscience. Washington, D.C. (Poster)
14. **Andrade A**, Denome S, Marangoudakis S, Lipscombe D. (2009) Exon-substitution in the mouse *Cacna1b* gene reveals the functional consequences of alternative splicing on N-type calcium channels in sensory neurons. Society for Neuroscience. Chicago, USA. (Poster)
15. Raingo J, **Andrade A**, Khvotchev M, Lipscombe D and Kavalali E. (2009) Activity-dependent trafficking of the voltage gated calcium channel subunit Cav $\alpha_2\delta$  at synapses. Society for Neuroscience. Chicago, USA. (Poster)
16. Avila T, **Andrade A**, Aguilar E, Felix R. (2005) Cav3 channel expression in the clonal C2C12 muscle cell line. Annual Meeting of the Mexican Society for Physiological Sciences. Guadalajara, Mexico. (Poster)
17. **Andrade A**, Sandoval A, Felix R. (2008) The  $\alpha_2\delta$  auxiliary subunit regulates recombinant L-type (Cav1.3) Ca<sup>2+</sup> channels. Society for Neuroscience. Washington DC, USA. (Poster)
18. Avila T, **Andrade A**, Bermudez de Leon M, Cisneros B, Hernandez-Hernandez O, Felix R. (2007) An untranslated CTG triplet expansion within the myotonic protein kinase (DMPK) gene alters calcium channel functional expression in PC12 cells. Society for Neuroscience. San Diego, CA, USA. (Poster)

19. **Andrade A**, Sandoval A, Oviedo N, Felix R. (2007) Proteolytic cleavage of  $\alpha_2\delta$  subunit is important for calcium channel activity. IBRO International Congress of Neuroscience. Melbourne, Australia. (*Poster*)
20. **Andrade A**, Sandoval A, Felix R. (2006) Inhibition of recombinant N-type voltage-gated  $\text{Ca}^{2+}$  channels by the  $\alpha_2\delta$  subunit. 36<sup>th</sup> Annual meeting, Society for Neuroscience. Program No. 333.1/E24. Society for Neuroscience. Atlanta, GA, USA. (*Poster*)
21. Sandoval A, **Andrade A**, Felix R. (2006) Inhibition of recombinant N-type  $\text{Ca}_v$  channels by the  $\alpha_2\delta$  subunit may involve unfolded protein response-dependent and -independent mechanisms. VI Ibero-American Congress of Biophysics. S13 Ion channels. Madrid, Spain. (*Poster*)
22. **Andrade A**, Bermudez M, Cisneros B, Felix R. (2006) Effects of the CTG trinucleotide repeats expansion in the MtPK gene on the expression of  $\text{Ca}^{2+}$  channels in PC12 cells. Annual Meeting of the Mexican Society for Physiological Sciences. XLIX:c229. Queretaro, Mexico. (*Poster*)
23. Avila T, **Andrade A**, Felix R. (2006) Regulation of  $\text{Ca}_v3.1$  channel expression by TGF $\beta$ -1 and BMP2 in C2C12 cells. Annual Meeting of the Mexican Society for Physiological Sciences. Queretaro, Mexico. (*Poster*)
24. Castro A, **Andrade A**, Vergara P, Segovia J, Aguilar J, Felix R, Delgado-Lezama R. (2008) Contribution of R-type channels to neurotransmitter release at the descending turtle spinal cord terminals synapsing motoneurons. Washington DC, USA. (*Poster*)
25. Felix R, **Andrade A**, Avila T, Escobedo L, Oviedo N, Sandoval A. (2005) The yin and yang of high-voltage activated  $\text{Ca}^{2+}$  channels: structure and function of the auxiliary subunits. Annual Meeting of the Mexican Society for Physiological Sciences. Guadalajara, Mexico. (*Poster*)
26. **Andrade A**, Oviedo N, Sandoval A, Félix R. (2005) The proteolysis of the  $\alpha_2\delta$  subunit is crucial for the activity of voltage-gated  $\text{Ca}^{2+}$  channels. Annual Meeting of the Mexican Society for Physiological Sciences. Guadalajara, Mexico. (*Poster*)
27. **Andrade A**, Sandoval A, Oviedo N, Félix R. (2004) Glycosylation of asparagines 136 and 184 is necessary for the  $\alpha_2\delta$ -1 subunit-mediated regulation of voltage-gated  $\text{Ca}^{2+}$  channels. Annual Meeting of the Mexican Society for Physiological Sciences. Veracruz, Mexico. (*Poster*)

## L. INVITED PRESENTATIONS

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### *Regional*

1. **Andrade A**. Use of alternative splicing for drug specificity (2021). Center of Integrated Biomedical and Bioengineering Research Retreat. University of New Hampshire.

### *National*

1. **Andrade A**. Use of alternative splicing for drug specificity (2019). University of New England, Biddeford, ME, USA.

2. **Andrade A.** Neuronal voltage-gated calcium channels in myoclonus-dystonia, pain and anxiety. (2014) Neurobiology Seminar Series, Department of Biology, University of Texas-San Antonio.
3. Lipscombe D, Denome S, **Andrade A**, Jiang Y, Marangoudakis S (2009). Optimizing calcium channels of nociceptors by alternative splicing. Keystone Symposia, the neurobiology of pain and analgesia. Santa Fe, New Mexico, USA.

### ***International***

1. Andrade A. Functional consequences of alternative splicing (2018). Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.
2. **Andrade A.** (2011) Role of alternative splicing of Cav2.2 pre-mRNA in the pain pathway. La Plata University. La Plata, Argentina.
3. Lipscombe D, **Andrade A**, Denome S, Jiang Y, Marangoudakis S (2009). Nociceptors regulate calcium channel drug sensitivity using alternative splicing. 6<sup>th</sup> meeting of the International Society of Autonomic Neuroscience. Sydney, Australia.

## **M. GRANTS**

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### ***Currently Held***

#### **Ca<sub>v</sub>2.2 splice isoforms in hippocampus: function and pharmacology.**

Role on the Project: Principal Investigator

Funder: National Institute of Mental Health

Mechanism: R01

Project Period: February 2022 - January 2027

Total requested: \$1,926,724

#### **RNA-protein interactions in Nociception**

Role on the Project: Co-Investigator (PI: Benjamin Harrison, UNE)

Funder: National Institute of Neurological Disorders and Stroke

Mechanism: R01

Project Period: March 2022 - February 2027

Total requested: \$2,066,412 (170,000 to AA)

#### **Real-time detection of glutamate using templated polymers as shape-changing target receptors.**

Role on the Project: Co-Principal Investigator

Funder: NIBIB

Mechanism: R21 Trailblazer

Project Period: April 2021- December 2023

Total requested: \$578,921 (151,525 to AA)

## ***Completed***

### **Cav2.2 splice isoforms in hippocampus: function and pharmacology.**

Role on the Project: Principal Investigator

Funder: NIGMS-CIBBR

Mechanism: Pilot Project

Project Period: November 2020 - May 2021

Total requested: \$15,000

### **Role of Gli3-dependent transcription on inflammatory pain.**

Role on the Project: Co-Principal Investigator

Funder: UNH

Mechanism: CoRE-Pilot Project Partnership

Project Period: August 2021 - July 2022

Total requested: \$30,000

### **Role of G<sub>i/o</sub> protein inhibition of Cav2.2 calcium channels in anxiety-like behavior.**

Role on the Project: Principal Investigator

Funder: National Institute of Mental Health

Mechanism: R00, MH-099405

Project Period: September 2015-August 2019

Total amount: \$750,000

### **Role of G<sub>i/o</sub> protein inhibition of Cav2.2 calcium channels in anxiety-like behavior.**

Role on the Project: Principal Investigator

Funder: National Institute of Mental Health

Mechanism: K99, MH-099405

Project Period: September 2013-August 2015

Total amount: \$200,000

### **Brain-specific calcium channel splice variants**

Role on the Project: Principal Investigator

Funder: University of New Hampshire

Mechanism: Collaborative Research Excellence

Project Period: June 2019-May 2021

Total amount: \$30,000

### **Role of cholecystokinin expressing neurons in chronic pain**

Role on the Project: Principal Investigator

Funder: University of New Hampshire

Mechanism: COLE Neuroscience Research Fund

Project Period: December 2018-December 2020

Total amount: \$8,000

### **Influence of enriched environment on nociception**

Role on the Project: Principal Investigator  
Funder: University of New Hampshire  
Mechanism: Collaborative Research Excellence  
Project Period: June 2018-May 2020  
Total amount: \$25,000

***Submitted***

**High density microelectrode array probe for spatially and temporally resolved monitoring of glutamate**

Role on the Project: Co-Investigator  
Funder: NIH  
Mechanism: R21  
Project Period: June-2024 - May 2025  
Total requested: \$79,750

**Effects of polypharmacy and deprescribing in Alzheimer's Disease and Related Dementia**

Role on the Project: Principal Investigator  
Funder: NIH  
Mechanism: R01  
Project Period: April-2023 - March 2028  
Total requested: \$3,886,972

**Not funded**

**NSF CAREER: Investigating the regulation of Rbfox proteins by nerve growth factor during sympathetic development**

Role on the Project: Principal Investigator  
Funder: National Science Foundation  
Mechanism: CAREER  
Project Period: April 2022 - March 2027  
Total requested: \$1,187,283

**Real-Time Monitoring of Fast-Acting Synaptic Neurotransmission of Glutamate and GABA**

Role on the Project: Co-Investigator (PI, Edward Song)  
Funder: Common Fund, NIH.  
Mechanism: NIH Director's New Innovator Award Program  
Project Period: September 2022 - August 2027  
Total requested: \$2,247,812 (\$889,585 to AA)

**Bioluminescence for optimal brain control and imaging.**

Role on the Project: Principal Investigator  
Funder: UNH

Mechanism: CoRE-Interinstitutional Pilot Project Partnership

Project Period: August 2021 - July 2022

Total requested: \$30,000

**NSF CAREER: Investigating the control of cell-specific splicing programs and splicing regulators by trophic factors during sympathoadrenal development**

Role on the Project: Principal Investigator

Funder: NSF

Mechanism: CAREER

Project Period: January 2021 - December 2025

Total requested: \$1,057,248

**Cav2.2 splice isoforms in hippocampus: function and pharmacology.**

Role on the Project: Principal Investigator

Funder: National Institute of Mental Health

Mechanism: R01

Project Period: November 2020 - October 2025

Total requested: \$1,844,000

**Presynaptic role of N-type calcium channel splice variants.**

Role on the Project: Principal Investigator

Funder: Whitehall Foundation

Mechanism: Research grant

Project Period: November 2019 - October 2021

Total requested: \$140,000

**Presynaptic role of N-type calcium channel splice variants**

Role on the Project: Principal Investigator

Funder: COBRE-University of New Hampshire, P20GM113131

Mechanism: Pilot Project Research Grant

Project Period: June 2019 - May 2020

Total requested: \$75,000

**Presynaptic N-type calcium channels in fear pathways**

Role on the Project: Principal Investigator

Funder: National Institute of Mental Health

Mechanism: R01

Project Period: September 2019 - August 2024

Total requested: \$2,800,000

**Applying a mouse model for examining the role of the gut microbiome in opioid abuse liability.**

Role on the Project: Co-Principal Investigator

Funder: COBRE-University of New Hampshire, P20GM113131

Mechanism: Pilot Project Research Grant

Project Period: June 2019 - May 2020

Total requested: \$75,000

**Applying a mouse model for examining the role of the gut microbiome in opioid abuse liability.**

Role on the Project: Co-Principal Investigator

Funder: University of New Hampshire

Mechanism: Collaborative Research Excellence

Project Period: June 2019 - May 2020

Total requested: \$30,000

## **N. TEACHING ROLES**

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### ***Grants in support of teaching***

#### **Support to start a neuroscience teaching laboratory**

Role on the Project: Co-Principal Investigator

Funder: University of New Hampshire

Mechanism: Neuroscience Initiative

Project Period: July-August 2017

Total amount: \$100,000

### ***Training and mentorship experience***

#### ***Postdoctoral Researchers***

Aaron Bradford (*University of New Hampshire, currently at Regis College*)

#### ***Mentored Graduate students***

Camryn Berry (*University of New Hampshire*)

Estefania Garcia (*University of New Hampshire*)

Laura Trachtenberg (*University of New Hampshire*)

Shayna Mallat (awarded STAF fellowship, *University of New Hampshire, currently at the Broad Institute*)

Ashton Brennecke (awarded STAF fellowship, *University of New Hampshire, currently at Biogen*)

Maxwell Blazon (*University of New Hampshire, currently at the University of New England D.O. program*)

Alexandra Bunda (*University of New Hampshire, currently at Agios Pharmaceuticals*)

Brianna LaCarubba (awarded Trainee Development Program Award from the Society for Neuroscience, *University of New Hampshire, currently at Pfizer*)

#### ***Trained Graduate Students***

Celio Junior (*University Belo Horizonte, Belo Horizonte, Brazil*)

Kristin Webster (*Neuroscience Graduate Program, Brown University*)

Patrick O'Hern (*Neuroscience Graduate Program, Brown University*)

Valerie Yorgan (*Neuroscience Graduate Program, Brown University*)

Aaron Held (*Molecular Pharmacology, Physiology and Biotechnology Program, Brown University*)

Erin Hoops (*Neuroscience Graduate Program, Brown University*)

Traudy Avila (*Neuroscience Program, Department of Physiology, Biophysics and Neuroscience, Center for Research and Advanced Studies of the National Polytechnic Institute, Mexico*)

Margarita Barajas (*Neuroscience Program, Department of Physiology, Biophysics and Neuroscience, Center for Research and Advanced Studies of the National Polytechnic Institute, Mexico*)

#### *Mentored Undergraduate students*

Vladmir Tkachev (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire*)

Forest MacKenzie (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire*)

Audrey Bello (*awarded McNair scholarship, University of New Hampshire*)

Jack Wallace (*University of New Hampshire*)

Natalie Czepiel (*University of New Hampshire, currently at Sanofi*)

Laura Kahoe (*University of New Hampshire, currently at the University of New Hampshire in the Biochemistry doctoral program*)

Dillon Mulhern (*University of New Hampshire, currently at Kennebec Estuary Land Trust*)

Angela Monahan (*University of New Hampshire*)

Melanie Bertolino (*awarded Research Experience and Apprenticeship Program, University of New Hampshire*)

Julian Brown (*awarded Research Experience and Apprenticeship Program, University of New Hampshire*)

Juan Gomez-Rivadeneira (*awarded Weeks Research Fellowship and McNair Scholarship, University of New Hampshire, currently at the Broad Institute*)

Zoe Beausoleil (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire, currently at the Philadelphia College of Osteopathic Medicine*)

Marie Akiki (*awarded McNair scholarship, University of New Hampshire, currently at the Broad Institute*)

Caleb Grot (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire*)

Hannah Sargent (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire, currently at Tufts University*)

Sumeet Panesar (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire, currently at the University of Pittsburgh*)

Zachary Tepper (*awarded Summer Undergraduate Research Fellowship, University of New Hampshire*)

Kitty Savage (*awarded Weeks Research Fellowship and Create Your Own Story Initiative, University of New Hampshire, currently at the Broad Institute*)

Peyton Waddicor (*University of New Hampshire, currently at Harvard University*)

#### *Trained Undergraduate students*

Maïté Van Hentenryck (*Brown University*)

Kishan Patel (*Brown University*)

Sophia Lin (*Brown University*)

Beth Mottel (*Brown University*)

### *Courses taught*

| Session     | Course                                                       | Class size | Evaluation (out of 5) | Hours   |              |
|-------------|--------------------------------------------------------------|------------|-----------------------|---------|--------------|
|             |                                                              |            |                       | Lecture | Lab/tutorial |
| Fall 2020   | NSB 500/NSB 501. Fundamentals of Neuroscience and behavior I | 42         | 4.83                  | 56      | 182          |
| Spring 2020 | NSB 705. Cellular and Molecular Neurobiology                 | 13         | N/A                   | 56      | 14           |
| Fall 2019   | NSB 500/NSB 501. Fundamentals of Neuroscience and behavior I | 57         | 4.63                  | 56      | 182          |
| Spring 2020 | NSB 705. Cellular and Molecular Neurobiology                 | 12         | 4.95                  | 56      | 16           |
| Fall 2018   | NSB 500/NSB 501. Fundamentals of Neuroscience and behavior I | 47         | 4.55                  | 56      | 122          |
| Spring 2018 | NSB 705. Cellular and Molecular Neurobiology                 | 10         | 4.90                  | 56      | 16           |
| Fall 2017   | NSB 500/NSB 501. Fundamentals of Neuroscience and behavior I | 44         | 4.53                  | 56      | 122          |
| Spring 2017 | NSB 705. Cellular and Molecular Neurobiology                 | 10         | 4.75                  | 56      | 16           |
| Fall 2016   | NSB 500/NSB 501. Fundamentals of Neuroscience and behavior I | 25         | N/A                   | 56      | 90           |
| Spring 2016 | Zool 777. Neurobiology                                       | 98         | N/A                   | 56      | 16           |

### *Courses developed*

2017-present Implemented peer-led team learning (PLTL) for neuroscience students at the University of New Hampshire.

2016 NSB500/NSB501. Fundamentals of Neuroscience and behavior with lab.

2016 NSB 705. Cellular and Molecular Neurobiology

2016 BIOL 805. Graduate level Cellular and Molecular Neurobiology

2012-2015 Instructor at “Neuropracticum”, technique-oriented course for the Neuroscience Graduate Program of Brown University. Marine Biological Laboratory, Woods Hole, MA.

-I actively participated in the organization and design of this course. I trained graduate students from Brown University in several electrophysiological techniques.

2013 Sheridan Center for Teaching and Learning, Certificate I.

-Course offered by Brown University to develop reflective teaching strategies that are based on how students learn.