

CURRICULUM VITAE

Diana Lizbeth de la Cruz Ramírez
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Education

- 2013-2017 **Ph.D. in Biomedical Sciences** (summa cum laude)
School of Medicine, Universidad Nacional Autonoma de Mexico
Thesis: PIP₂ regulates voltage-gated calcium channel and insulin release in pancreatic β cells.
Advisor: Dr. David E. García Díaz
- 2008-2012 **B.Sc. in Biomedical Sciences** (summa cum laude)
School of Medicine, Universidad Nacional Autonoma de Mexico
Thesis: Degeneration of spinal motor neurons induced by chronic AMPA-excitotoxic stimulus *in vivo* and the role of NADPH oxidases.
Advisor: Dr. Ricardo Tapia Ibargüengoytia

Research Experience and Postgraduate Training

- 2023- **Assistant Professor**, Department of Biological Sciences, Idaho State University, Pocatello, Idaho.
- 2022-2023 **Acting Instructor**, Department of Physiology and Biophysics, School of Medicine, University of Washington, Seattle, Washington. Advisor: Dr. Oscar Vivas.
- 2020-2022 **Postdoctoral scholar**, Department of Physiology and Biophysics, School of Medicine, University of Washington, Seattle, Washington. Advisor: Dr. Oscar Vivas.
- 2017-2020 **Postdoctoral scholar**, Department of Physiology and Biophysics, School of Medicine, University of Washington, Seattle, Washington. Advisor: Dr. Bertil Hille.
- 2016-2017 **Scientific Staff**, Centro de Ciencias de la Complejidad (C3), UNAM, Cd. Mx., Mexico. Advisor: Dr. Christopher Stephens.
- 2013-2017 **Graduate Research Assistant**, Department of Physiology, School of Medicine, UNAM, Cd. Mx., Mexico. Advisor: Dr. David E. García Díaz
- 2010-2012 **Undergraduate Research Assistant**, Department of Molecular Neuropathology, Instituto de Fisiología Celular (IFC), UNAM, Cd. Mx., Mexico. Advisor: Dr. Ricardo Tapia Ibargüengoytia.
- 2009-2010 **Undergraduate Research Assistant**, Department of Molecular Biology and Biotechnology, Instituto de Investigaciones Biomédicas (IIB), UNAM, Cd. Mx., Mexico. Advisor: Dr. Carmen Gómez Eichelmann.
- 2008-2009 **Undergraduate Research Assistant**, Department of Physiology, School of Medicine, UNAM, Cd. Mx., Mexico. Advisor: Dr. David E. García Díaz.

Present and Previous Research areas

- Age-driven changes in glucose metabolism.
- Age-driven changes of the sympathetic nervous system.
- Regulation of ion channels and calcium signaling by G protein-coupled receptors.
- Metabolism of phosphoinositide lipids.
- Metabolic diseases and their relationship with aging in the Mexican population.

- Degeneration of spinal motor neurons induced by chronic AMPA-excitotoxic stimulus.
- Repair and protection of damage by DNA gyrase inhibitors in Escherichia coli K12.

Professional Memberships

2022-	Postdoctoral Member, Society of General Physiologists
2022-	Postdoctoral Member, American Aging Association
2021-	Regular member, Biophysical Society
2021-	Postdoctoral Member, Society of Biophysicists of Latin America
2019-	Postdoctoral Member, Society for Neuroscience
2017	Postdoctoral Member, The American Society for Cell Biology
2016	Student member, Society for Neuroscience
2012	Student member, Sociedad Mexicana de Bioquímica (Mexican Society of Biochemistry)

Teaching and Mentoring Experience

2022-2023	Research Mentor of high school students in the UW Science Summer Program.
2022-2023	Mentor of underrepresented minority high school students in the Making Connections program at the University of Washington.
2017	Research Mentor of a high school student with the research project: The relationship between the consumption of sugar-sweetened beverages and body composition of teenage Mexican women. Programa Adopte un Talento (Adopt a Talent Program). Instituto de Ciencias Nucleares (ICN), Cd. Mx., Mexico.
2016	Lecturer in COLPES-PAUTA (pedagogical schools), "How should the scientific method be taught to children?", Cuernavaca, Morelos, Mexico.
2012-2017	Lecturer of Physiology, Department of Physiology, School of Medicine, UNAM, Cd. Mx., Mexico.

Diversity Advocate Activities

2022	Diversity writer "Diversity as the fuel of my scientific career". J Cell Sci, 2022, 135: jcs26003.
2021	Motivational virtual seminar speaker "Electrical bases of human body: neurons", Preparatoria Tecmilenio campus Querétaro (High-School level). Querétaro, México.
2021	Motivational virtual seminar speaker "How to become Dr. Frankenstein? Electrical bases of human body, Escuela Secundaria Técnica #88", Jesús Reyes Heróles (MiddleSchool level), Álvaro Obregón, Cd. Mx., Mexico.
2020	Motivational virtual seminar speaker "Postdoctoral stay: myths, dreams and facts". Maestría en Ciencias en Ingeniería Química (Graduate-School level), Universidad Autónoma de Tlaxcala, Apizaco, Tlaxcala.
2020	Motivational virtual seminar speaker "Science career and maternity: Is it compatible?". Facebook transmission through Científicas mexicanas.
2020	Top 10 in NeuroAdvocate Challenge -Society for Neuroscience.
2019	Diversity writer "Mother, wife and scientist: a healthy life balance". Revista Globalmedi. Diciembre.
2015	Motivational virtual seminar speaker "How to become Dr. Frankenstein? Electrical bases of human body, Escuela Secundaria Técnica Telpochcalli (Elementary and MiddleSchool level), Tepoztlán, Morelos, Mexico.

Honors, Awards, and Fellowships

- 2022 **Travel Award** to attend 66th Biophysical Society Annual Meeting. San Francisco, California, USA.
- 2021-2023 **Weill Neurohub Fellowship**. UCSF Weill Institute for Neurosciences, California, USA.
- 2020 **Women in Science Travel Fund (WIST)**. The Rockefeller University, New York, USA.
- 2020-2022 **National researcher I**, National Council of Science and Technology (CONACYT), México.
- 2017 **First place as a mentor in National Science Fair** in Adopt a talent program (PAUTA).
- 2015-2016 **Fellowship** from Programa de Apoyo a los Estudios de Posgrado (PAEP, Postgraduate Studies Support Program), UNAM, Mexico.
- 2013-2017 **Fellowship** from CONACYT, Ph.D. program in Biomedical Science, Mexico.
- 2010-2012 **Fellowship** from CONACYT to be "Assistant Researcher," Lab. of Dr. Ricardo Tapia Ibarquengoytia, IFC, UNAM, Mexico.
- 2010-2011 **Academic Honors**, Licenciatura en Investigación Biomédica Básica (LIBB, Bachelor's Degree in Basic Biomedical Research), School of Medicine, UNAM, Mexico.
- 2008-2012 **Fellowship** from Programa de Alta Exigencia Académica (PAEA, High Academic Requirement Program), UNAM, Mexico.
- 2005 **Fellowship** from Centro de Investigación y de Estudios Avanzados (CINVESTAV) to attend the national science workshop (Taller Ciencia Viva) for high school students, Irapuato, Guanajuato, Mexico.

Academic seminars

- 2023 Seminar "Sympathetic Motor Neuron Dysfunction is a Missing Link in Age-Associated Sympathetic Overactivity," School of Medicine, 2023, UNAM, CdMx.
- 2023 Seminar "The loss of the organ function: From the sympathetic nervous system to pancreatic endocrine dysfunction", Pharmacology retreat 2023, WA, USA.
- 2021 Seminar "How does our nervous system age? A perspective from the postganglionic neuron", Centro de Ciencias de la Complejidad, C3, UNAM, CdMx.
<https://www.youtube.com/watch?v=qeSaJq77oHo&t=674s>
- 2017 Seminar "Regulation of voltage-gated ion channels by PIP₂ in pancreatic beta cells". Centro de Ciencias de la Complejidad, C3, UNAM, CdMx.

Publications

Peer-reviewed original research publications

1. **de la Cruz L**, Bui D, Moreno CM, Vivas O. Sympathetic Motor Neuron Dysfunction is a Missing Link in Age-Associated Sympathetic Overactivity. *eLife*, 2023, *in press*.
2. Jensen JB, Falkenburger BH, Dickson EJ, **de la Cruz L**, Dai G, Myeong J, Jung SR, Kruse M, Vivas O, Suh BC, Hille B. Biophysical physiology of phosphoinositide rapid dynamics and regulation in living cells. *J Gen Physiol*, 2022, *154*: e202113074.
3. **de la Cruz L**, Kushmerick C, Kruse M and Vivas O. Hippocampal neurons maintain a large PtdIns(4)P pool that results in faster PtdIns(4,5)P₂ synthesis. *J Gen Physiol*, 2022, *154*: e202113001.
4. **de la Cruz L**, Riquelme-Neculpan R, Vivas O, Barria A, Jensen JB. Dishevelled coordinates PI4KIII α and PIP5KII γ for PIP₂ synthesis with M₁R and ROR2 signaling. *J Cell Sci*, 2022, *4*: jcs.259145.

5. Lugo-Fabres PH, Otero-Sastre LM, Bernáldez-Sarabia J, Camacho-Villegas TA, SánchezCampos N, Serrano-Bello J, Medina-Velázquez LA, Muñiz-Hernández S, **de la Cruz L**, Arenas I, Barajas-Martínez A, García DE, Sandoval G, González-Canudas J, Licea-Navarro AF. Potential therapeutic applications of synthetic conotoxin s- 2 cal14.2b, derived from *Californiconus californicus*, for treating type 2 diabetes. *Biomedicines*, 2021, 9: 936.
6. Barajas-Martínez A, Bermeo Mora K, **de la Cruz L**, Martínez-Vargas M, Martínez-Tapia RJ, García DE, Navarro L. Cannabinoid receptors are differentially regulated in the pancreatic islets during the early development of metabolic syndrome. *Islets*, 2020, 12:134-144.
7. Myeong J, **de la Cruz L**, Jung SR, Koh DS, Hille B. Phosphatidylinositol 4,5-bisphosphate regeneration by speeding of PI 4-kinase during PLC activation. *J Gen Physiol*, 2020, 152: e202012627.
8. Barajas-Martínez A, Easton JF, Rivera AL, Ricardo Martínez-Tapia R, **de la Cruz L**, Robles-Cabrera A, Stephens CR. Metabolic Physiological Networks: The Impact of Age. *Front. Physiol*, 2020, 11: 587994.
9. Stephens CR, Easton JF, Robles-Cabrera A, Fossion R, **de la Cruz L**, Ricardo Martínez-Tapia R, Barajas-Martínez A, Hernandez-Chavez A, Lopez-Rivera JA, Rivera AL. Metabolic risk and the role of higher education. *Front Public Health*. 2020, 8: 180.
10. **de la Cruz L**, Traynor-Kaplan A, Vivas O, Hille B, Jensen JB. Plasma membrane processes regulated by type I phosphatidylinositol phosphate 5-kinases and RASSF4. *J Cell Sci*. 2020, 133(2): jcs233254.
11. Garduño J, Hernández-López S, Castillo Rolón D, **de la Cruz L**, Hernández-Vázquez F, ReyesVaca A, Arenas I, Bravo-Martínez J and Garcia DE. Electrophysiological characterization of glucose sensing neurons in the hypothalamic arcuate nucleus. *Neurosci Lett*. 2019, 11 (703): 168-176.
12. **de la Cruz L**, Reyes-Vaca A, Garduño J, Arenas I, Garcia DE. Sympathetic voltage-independent regulation of voltage-gated calcium channels in pancreatic β cells. *J Endocrinol Diab*. 2018, 5 (1): 1-5.
13. Reyes-Vaca A, **de la Cruz L**, Garduño J, Arenas I, Garcia DE. Fast Inactivation of $Ca_v2.2$ Channels Is Prevented by the $G\beta_1$ Subunit in Rat Sympathetic Neurons. *J Mol Neurosci*. 2017, 63 (3-4):377-384.
14. **de la Cruz L**, Puente EI, Reyes-Vaca A, Arenas I, Garduño J, Bravo-Martínez J, Garcia DE. PIP_2 in pancreatic β cells regulates voltage-gated calcium channel. *Am J Physiol Cell Physiol*. 2016, 311(4):C630-C640.
15. Puente EI, **de la Cruz L**, Arenas I, Elias-Vinas D, Garcia DE. Voltage-independent inhibition of the TTX-sensitive Na^+ currents by oxotremorine and angiotensin II in rat sympathetic neurons. *Mol Pharmacol*. 2016, 89 (4): 476-483.
16. Hernández-Castellanos JM, Vivas O, Garduño J, **de la Cruz L**, Arenas I, Elías-Viñas D, Mackie K, García DE. $G\beta_2$ mimics activation kinetic slowing of $Ca_v2.2$ channels by noradrenaline in rat sympathetic neurons. *Biochem Biophys Res Commun*. 2014, 445 (1): 250-254.

Science Outreach Articles

1. **de la Cruz L**, Garduño J. La batalla contra el sobrepeso y la obesidad en México: el caso de las bebidas azucaradas. Translation: The battle against overweight and obesity in Mexico: the case of soft drinks. *Revista Digital Universitaria*. Vol. 22, Número. 3, mayo-junio 2021. https://www.revista.unam.mx/wp-content/uploads/v22_n3_a6.pdf

2. **First person – de la Cruz L interview.** J Cell Sci, 2020, 133: jcs243147 5.
<https://doi.org/10.1242/jcs.243147>
3. **de la Cruz L.** Sobrepeso y Obesidad en la UNAM. Translation: Overweight and Obesity at UNAM, Gaceta C3. 2018, UNAM. <https://www.c3.unam.mx/boletines/boletin23.html>
4. García González B, **de la Cruz L**, García DE, Garduño J. ¿Por qué sentimos hambre o saciedad? La regulación de la ingesta y el peso corporal. Translation: Why do we get hungry and thirsty? The regulation of food intake and body weight. Revista Ciencias. 2018, Número 126-127, UNAM. <https://www.revistacienciasunam.com/es/207-revistas/revista-ciencias-127128/2108-%C2%BFpor-qu%C3%A9-sentimos-hambre-o-saciedad-la-regulaci%C3%B3n-de-la-ingesta-y-el-peso-corporal.html>

Book chapters

1. de la Cruz L and Garduño Julieta. Chapter 20. Funciones básicas del hipotálamo (Basic functions of hypothalamus), Alexánder. Fisiología celular y neurofisiología, 1a ed. Editorial El manual modern, 2022.

Presentations at scientific meetings

1. **de la Cruz L**, Moreno C, Vivas O. Aging alters the ion channel composition and excitability of postganglionic sympathetic neurons. Society for Neuroscience, San Diego, CA, USA, 2022. *Poster.*
2. **de la Cruz L**, Kushmerick C, Sullivan J, Kruse M, Vivas O. Analysis of PI(4,5)P₂ metabolism from the perspective of different cell types. Biophysical Society, San Francisco, CA, USA, 2022. *Short talk.*
3. Jensen JB, **de la Cruz L**, Traynor-Kaplan AE, Hille B. PI 4-Kinase and PIP 5-Kinase Cooperate to Replenish PtdIns(4,5)P₂ after Receptor-Mediated Depletion. Biophysical Society, San Diego, CA, USA, 2020. *Poster.*
4. **de la Cruz L**, Jensen JB, Hille B. PI 4-kinase and PIP 5-kinase cooperate to replenish PI(4,5)P₂ after receptor-mediated depletion. Society for Neuroscience, Chicago, IL, USA, 2019. *Poster.*
5. Jensen JB, **de la Cruz L**, Hille B. Specific regulation of KCNQ2/3 channels and store-operated calcium entry by type I phosphatidylinositol phosphate kinases. The American Society for Cell Biology, San Diego, CA, USA, 2018. *Poster.*
6. Hernandez-Chavez A, Robles-Cabrera A, Easton JF, **de la Cruz L**, Martínez-Tapia RJ, BarajasMartínez A, Rhodes Stephens C. Sobrepeso y Obesidad en la población universitaria. Conferencia Científica Annual Sobre Síndrome Metabólico. Mexico city, Mexico, 2018. *Poster.*
7. Barajas-Martínez A, Martínez-Tapia RJ, Easton JF, Robles-Cabrera A, Hernandez-Chavez A, **de la Cruz L**, Rhodes Stephens C. Cluster analysis of age- and education-variables associated with Sx. Metabolic of workers and academics from UNAM. Conferencia Científica Annual Sobre Síndrome Metabólico. Mexico city, Mexico, 2018. *Poster.*
8. García DE, **de la Cruz L**, Bravo-Martínez J, Arenas I. How do G-proteins rule the life? 1st Symposium on Complexity and Time Series, Mexico City, Mexico, 2016. *Poster.*
9. Bravo-Martínez, **de la Cruz L**, García DE. Spike firing pattern encoded by underlying ion channel G-protein modulation in hippocampal CA1 pyramidal cells. 1st Symposium on Complexity and Time Series, Mexico City, Mexico, 2016. *Poster.*
10. **de la Cruz L**, Puente EI, Reyes-Vaca, Garduño J, Bravo-Martínez, García DE. PIP₂ in pancreatic β cells regulates voltage-gated calcium channels by a voltage-independent pathway. 1st Symposium on Complexity and Time Series, Mexico City, Mexico, 2016. *Poster.*

11. **de la Cruz L**, Puente EI, Reyes-Vaca A, Arenas I, Garduño J, Bravo-Martínez J and Garcia DE. PIP₂ in pancreatic β cells regulates voltage-gated calcium channel. Society for Neuroscience, San Diego, CA, USA, 2016. *Poster*.
12. Garcia DE, **de la Cruz L**, Arenas I. Neurotransmitter specificity in G-protein signaling cascades revealed by slowed activation of Cav 2.2 channels. Society for Neuroscience, Washington, DC, USA, 2014. *Poster*.
13. **de la Cruz L**, Valdés-Rives A, Arenas I, Garcia DE. Regulation of voltage-dependent calcium channels by G proteins in rat pancreatic β -cells. XXX Congreso Nacional de Bioquímica, Guadalajara, Jalisco, Mexico, 2014. *Poster*.
14. **de la Cruz-Ramirez L**, Tapia R. Spinal motor neuron degeneration induced by chronic AMPA excitotoxic stimulus *in vivo* and the role of NADPH oxidases. XXIX Congreso Nacional de Bioquímica, Oaxaca, Oaxaca, Mexico, 2012. *Poster*.
15. **de la Cruz L**, Tapia R. Degeneration of spinal motor neurons by chronic AMPA-induced excitotoxicity *in vivo* and role of NADPH oxidases. 3^{ra} reunión anual de los alumnos de la LIBB, Ciudad Universitaria, D.F., Mexico, 2012. *Short talk*.
16. **de la Cruz L**, Ramírez J, Gómez-Eichelmann C. Repair and protection of damage by DNA gyrase inhibitors in *Escherichia coli* K12. XXVIII Congreso Nacional de Bioquímica, Tuxtla Gutiérrez, Chiapas, Mexico, 2010. *Poster*.
17. **de la Cruz L**, Ramírez J, Gómez-Eichelmann C. Repair and protection of damage by DNA gyrase inhibitors in *Escherichia coli* K12, 1st reunión anual de los alumnos de la LIBB Ciudad Universitaria, Cd. Mx., Mexico, 2010. *Short talk*.
18. **de la Cruz L**, Castro H, Arenas I, Garcia DE. Na_v channels regulation by G proteins in sympathetic neurons. LII Congreso Nacional de Ciencias Fisiológicas, Morelia, Michoacan, Mexico, 2009. *Poster*.

Specialized Skills and technical expertise

- Electrophysiology: Patch-clamp, Patch-seq, amperometry, electrocardiography, electroencephalography, electromyography, and evoked potentials.
- Molecular biology: Transfection and intranuclear microinjection of cDNA and single cell sequencing.
- Cell and tissue cultures: Superior cervical ganglion- and pancreatic beta- cell culture, brain slices and cell lines and bacteria cultures.
- Fluorescence microscopy: High resolution microscopy, TIRF, FRET and Calcium measurement.
- Biochemistry and cell biology: Lipid extraction, mass spectrometry, immunohistochemistry.
- *In vivo* techniques: Animal handling, breeding, stereotaxic surgery, and motor activity tests.
- Clinical techniques: Collection and processing of blood for clinic and genetic analysis, anthropometric and corporal composition measurements.
- Basic computer programming.