

CURRICULUM VITAE

Juan-Pablo Castillo Gutierrez

Date of birth: July, 22 1985

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Education and Training

2015 - 2020 Postdoctoral training at University of California Berkeley, QB3 Institute. USA

2009 - 2014 Ph.D. program in Molecular and Cellular biology, and Neuroscience, University of Chile. Chile

2004 - 2008 Molecular Biotechnology Engineering, University of Chile. Chile

Academic Degrees

Ph.D. - Molecular and Cellular biology, and Neuroscience
September, **2014**, Faculty of Sciences, University of Chile

B.S. - Molecular Biotechnology Engineering
March, **2009**, Faculty of Sciences, University of Chile

Current position, Nov. 2024 - present

Young Investigator at Centro Interdisciplinario de Neurociencia de Valparaíso (CINV), Universidad de Valparaíso, Chile

Honors and Awards

2025 PEW Innovation Fund, (team with Dr. Eduardo Perozo)

2025 Visiting Fellow at Center for Mechanical Excitability, University of Chicago.

2019 Berkeley Postdoc Association Professional Development Award

2019 Travel Award, Lima Thematic Meeting. "Revisiting the Central Dogma of Molecular Biology at the Single-Molecule Level", Biophysical Society

2015 PEW Latin American Fellow for the Biomedical Sciences program.

2014 International Travel Award, Biophysical Society 58th Annual Meeting.

2012 CONICYT Ph. D. thesis support grant AT-24121240, Chilean government.

2011 CONICYT grant for supporting assistance to national and international meetings 67110248, Chilean government.

2010 MECESUP fellowship for supporting short research stays, UCH 0713, University of Chile.

2009 CONICYT graduate fellowship for PhD programs 21090197, Chilean Government.

Previous positions

Centro Interdisciplinario de Neurociencia de Valparaíso (CINV), Universidad de Valparaíso

Dec. 2023 – Nov. 2024	Research fellow
Sept. 2021 – Dec. 2023	Tech support in optics and electronics
May. 2014 - August 2015.	Postdoctoral researcher ; Advisor: Ramon Latorre Ph.D.
Feb. 2010 - April, 2014.	Ph.D. graduate student researcher; Advisor: Ramon Latorre Ph.D.
March. 2008 – Dec. 2008	Undergraduate Research assistant; Advisor: Ramon Latorre Ph.D.

SMAT-C, Universidad de Santiago de Chile

Sept. 2020 – May. 2023	Research fellow, Advisor: Francisco Melo Ph.D.
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University of Santiago, Chile

Sept, 2020 – Dec. 2022.	Lecturer at the Physics Department
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University of California Berkeley, QB3 Institute, USA

Sept, 2015 – July, 2020.	Postdoctoral researcher (PEW Latin American Fellow) Advisor: Dr. Carlos Bustamante, Ph.D.
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Teaching Experience

-Lecturer at the *troncal course* for PhD programs in Neuroscience and Biophysics and computational biology, Faculty of Sciences, University of Valparaíso, Chile.
Physicochemical basis of neuronal excitability, 2025.

-Lecturer at the Physics Department, Faculty of Science, University of Santiago, Chile
courses Sept. 2020 – Dec. 2022

- a) Optics Laboratory for pedagogy in Physics and Mathematics students
- b) Physics 1 and Biophysics for Chemistry students
- c) Physics for Medicine and Obstetrics students
- d) Biophysics for pedagogy in Physics and Mathematics students

-Lecturer at Biology Department, Faculty of Science, University of Chile, Chile

General Physiology course 2021 – 2022

Topic: Instrumentation, voltage clamp, action potential, molecular motors.

-Instructor in General Physiology course, years 2009 - 2012, Faculty of Science, University of Chile.

Peer-reviewed Publications

Interspecies relationships of natural amoebae and bacteria with *C. elegans* create environments propitious for multigenerational diapause. Marcela Serey, Esteban Retamales, Gabriel Ibañez, Gonzalo Riadi, Patricio Orio, **Juan P. Castillo**^{**}, and Andrea Calixto^{**}. *mSystems*. **2025**. 0:e01566-24. ****correspondence**

The assembly of bacteria living in natural environments shape neuronal integrity and behavioral outputs in *C. elegans*. Sebastian Urquiza-Zurich, Victor Garcia-Angulo, Paula Burdisso, M. Palominos, Lucia Fernandez-Hubeid, Paloma Harcha, **Juan P. Castillo**, and Andrea Calixto. *mBio*. **2023**. 14(2), e03402-22.

Assignment of Structural Transitions During the Mechanical Unwrapping of Nucleosomes and their Disassembly Products. César Díaz-Celis*, Cristhian Cañari-Chumpitaz*, Robert P. Sosa*, **Juan P. Castillo***, Meng Zhang, Enze Cheng, Andy Chen, Michael Vien, JeongHoon Kim, Bibiana Onoa, and Carlos Bustamante. *PNAS*. **2022**. 119(33), e2206513119. ***equal author contribution**

Friction-driven membrane scission by the human ESCRT-III proteins CHMP1B and IST1. A. King Cada, Mark R. Pavlin, **Juan P. Castillo**, Alexander B. Tong, Kevin P. Larsen, Xuefeng Ren, Adam Yokom, Feng-Ching Tsai, Patricia M. Bassereau, Carlos J. Bustamante, James H. Hurley. *PNAS*. **2022**. . 119(29), e2204536119

A DNA packaging motor inchworms along one strand allowing it to adapt to alternative double-helical structures. **Juan P. Castillo***, Alexander Tong*, Sara Tafoya, Paul J. Jardine & Carlos Bustamante. *Nat. Commun*. **2021**. 12:3439. ***equal author contribution**

Molecular switch-like regulation enables global subunit coordination in a viral ring ATPase. Tafoya S, Liu S, **Castillo JP**, Atz R, Morais MC, Grimes S, Jardine PJ, Bustamante C. *PNAS*. **2018**. 115(31):7961-7966.

β 1-subunit-induced structural rearrangements of the Ca^{2+} - and voltage-activated K^{+} (BK) channel. **Castillo JP***, Sánchez-Rodríguez JE*, Hyde HC*, Zaelzer CA, Aguayo D, Sepúlveda RV, Luk LY, Kent SB, Gonzalez-Nilo FD, Bezanilla F, Latorre R. PNAS. **2016**. 113(23):E3231-9 ***equal author contribution**

Biophysical analysis of thermosensitive TRP channels with a special focus on the cold receptor TRPM8. Carrasquel-Ursulaez W, Moldenhauer H, **Castillo JP**, Latorre R, Alvarez O. Temperature (Austin). **2015**. 2(2):188-200.

Mechanism of potassium ion uptake by the $\text{Na}^{+}/\text{K}^{+}$ -ATPase. **Juan P. Castillo**, Huan Rui, Daniel Basilio, Avisek Das, Benoit Roux, Ramon Latorre, Francisco Bezanilla, and Miguel Holmgren. Nat. Commun. **2015**. 6:7622.

Temperature and voltage coupling to channel opening in transient receptor potential melastatin 8 (TRPM8). Raddatz N*, **Castillo JP***, Gonzalez C, Alvarez O, Latorre R. J Biol Chem. **2014**. 289(51): 35438-54 ***equal author contribution**

A BK (Slo1) channel journey from molecule to physiology. Contreras GF, Castillo K, Enrique N, Carrasquel-Ursulaez W, **Castillo JP**, Milesi V, Neely A, Alvarez O, Ferreira G, González C, Latorre R. Channels. **2013**. 7:442-58

Energy landscape of the reactions governing the Na^{+} deeply occluded state of the $\text{Na}^{+}/\text{K}^{+}$ -ATPase in the giant axon of the Humboldt squid. **Juan Pablo Castillo**, Daniela De Giorgis, Daniel Basilio, David C. Gadsby, Joshua J. C. Rosenthal, Ramon Latorre, Miguel Holmgren and Francisco Bezanilla. PNAS. **2011**. 108:20556-20561

Thermopo-TRP channel: biophysics of polymodal receptors. Baez-Nieto D, **Castillo JP**, Dragicevic C, Alvarez O, Latorre R. Adv Exp Med Biol. **2011**; 704:469-9

Presentations in Scientific Societies

25th International Worm Meeting, June 28 - July 2, UC Davis, California. Poster presentation: Victoria Collio, **Juan Pablo Castillo** and Andrea Calixto. Temperature-Dependent Neuroprotection in the MEC-4d Model: Who is the target?

CeNeuro 2022 | C. elegans Topic Meeting: neuronal development, synaptic function and behavior. Vienna, Austria. July 24-27, **2022**. Poster presentation: "Multigenerational inheritance of beneficial bacterial effects on neuronal integrity and development". **Juan Pablo Castillo**, Paloma Harcha, Mauricio Caneo and Andrea Calixto

Biophysical Society Thematic Meeting. "Revisiting the Central Dogma of Molecular Biology at the Single-Molecule Level". Lima, Peru. July 18-21, **2019**. Poster and platform presentations: "Challenging a DNA Packaging Motor with Modified Substrates". **Castillo JP**, Tong A, Tafoya S, Jardine PJ, Bustamante C.

Biophysical Society 62th annual meeting. San Francisco, CA USA. February 17-21, **2018**. Poster presentation: "Challenging a DNA Packaging Motor with a Modified Substrate". **Castillo JP**, Tong A, Tafoya S, Jardine PJ, Bustamante C.

Biophysical Society 62th annual meeting. San Francisco, CA USA. February 17-21, **2018**. Platform: "Molecular Switch-Like Regulation Enables Global Coordination in a Viral Ring ATPase". Tafoya S*, Liu S, **Castillo JP**, Atz R, Morais MC, Grimes S, Jardine PJ, Bustamante C. * presenting author

Ion channels in the valley, IV meeting. Montegrande, Chile. April 19-22 **2017**. Platform: "A molecular ruler for an ion channel - My little journey". **Juan P. Castillo**

Biophysical Society 59th annual meeting. Baltimore, MD USA. February 7-11, **2015**. Platform: "Temperature and Voltage Coupling to TRPM8 Channel Opening". Natalia Raddatz, **Juan P. Castillo***, Carlos Gonzalez, Osvaldo Alvarez, Ramon Latorre. * presenting author

Biophysical Society 58th annual meeting. San Francisco, CA USA. February 15 – 19, **2014**. Poster presentation: "K⁺ TRANSLOCATION BY THE GIANT AXON OF THE HUMBOLDT SQUID NA⁺/K⁺ ATPASE". **Juan P. Castillo**, Daniel Basilio, Ramon Latorre, Francisco Bezanilla, Miguel Holmgren.

Gordon Research Conferences: Mechanisms of membrane Transport. Mount Holyoke, June 16-21, **2013**. Poster presentation: "K⁺ translocation by the giant squid axon Na⁺/K⁺ ATPase". **Juan P. Castillo**, Daniel Basilio, Ramon Latorre, Francisco Bezanilla, Miguel Holmgren. ***selected for student oral presentation.**

Biophysical Society 57th annual meeting. Philadelphia, USA. February 2 – 6, **2013**. Platform: "External architecture of the large-conductance Ca²⁺ and voltage-activated K⁺ (BKCa) revealed by a spectroscopic ruler". **Juan Pablo Castillo**, Jorge E. Sánchez-Rodríguez*, Clark Hyde, Christian Zaelzer, Daniel Aguayo, Stephen Kent, Fernando Gonzalez-Nilo, Francisco Bezanilla and Ramon Latorre. * presenting author

Biophysical Society 56th annual meeting. San Diego, CA USA. February 25 – 29, **2012**. Poster presentation: "Energy landscape of the reactions governing the Na⁺ deeply occluded state of the Na⁺/K⁺-ATPase in the giant axon of the Humboldt squid". **Juan Pablo Castillo**, Daniela De Giorgis, Daniel Basilio, David C. Gadsby, Joshua J. C. Rosenthal, Ramon Latorre, Miguel Holmgren and Francisco Bezanilla.

Chilean Society of Neuroscience, VII annual meeting. Santa Cruz, Chile. September 27 – 29, **2011**. Poster presentation: “Lessons from the squid giant axon: single-file diffusion revisited”. **Juan Pablo Castillo**

Technical skills

Electronics: design and assembly of analog/linear electronics and optoelectronics for instrumentation in general. Design of vacuum tube amplifiers for musical instruments and hi-fi audio

Optics: design and assembly of microscopes: laser tweezers; spectral fluorometry; fluorescence-decay detection; imaging; phase contrast; DIC; confocal.

Electrophysiology: a) *X. laevis* oocyte expression model; patch clamp, TEVC, cutopenVC. b) squid giant axon voltage clamp.

Single molecule techniques: optical tweezers manipulation of biomolecules.

Molecular biology: DNA and RNA in vitro generation, manipulation and purification.

Languages

Native spanish speaker; fluent in english.

References

Ramon Latorre, Universidad de Valparaíso	ramon.latorre@uv.cl
Oswaldo Álvarez, Universidad de Chile	oalvarez@uchile.cl
Francisco Bezanilla, University of Chicago	fbezanilla@peds.bsd.uchicago.edu
Carlos Bustamante, University of California Berkeley	carlosb@berkeley.edu
Francisco Melo, Universidad de Santiago de Chile.	francisco.melo@usach.cl