CURRICULUM VITAE : David Olivier Naranjo Donoso

Academics :

1991 Doctor en Ciencias mención Biología, Universidad de Chile
1984 Licenciado en Ciencias mención Biología, Universidad de Chile

Title

Profesor Titular, Instituto de Neurociencia, Universidad de Valparaíso.
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Research Lines:

Principal: Voltage-gated Potassium channels: Permeation and activation mechanisms
Secondary:
Association and Dissociation of Neurotoxins to Potassium channels as models of Protein-Protein interaction.
Membrane physiology in the Origin of Life

Work Experience:

2002-	Profesor Titular, Instituto de Neurociencia, Universidad de Valparaíso, Valparaíso.
2012-2013	Visiting Scientist, Vollum Institute, Oregon Health and Science University, Portland, OR. USA.
1997-2002	Investigador Titular A. Instituto de Fisiología Celular, Universidad Nacional Autónoma de México. Distrito Federal, México
1993-1997	Post-doctoral fellow, Graduate Department of Biochemistry, Brandeis University, Waltham MA, USA.
1991-1993	Post-doctoral fellow, Department of Neurobiology and Behavior, State University of New York at Stony Brook, Stony Brook, NY, USA.

Administration

2018-2022 Chair; Graduate School, Facultad de Ciencias, Universidad de Valparaíso.
2015-2016 Chair; Comité de Autoevaluación Programa Doctorado en Ciencias Mención Neurociencia, Universidad de Valparaíso
2007-2011 Chair; Programa Doctorado en Ciencias Mención Neurociencia, Universidad de Valparaíso

Thesis Mentorship

Undergraduate

2022	Francisca Salas, Ingeniería en Bioinformática. U. de Talca.
2011	Luisa Montoya Lara. Licenciatura en Ciencias, mención Química, U. de Valparaíso

2008 Ariela Vergara-Jaque. Ingeniería en Bioinformática. U. de Talca.
2007 Cristian Moscoso. Bioquímico U. Católica de Valparaíso.
2007 Katherine Stack. Bioquímico U. Católica de Valparaíso.

Masters degree

2002 Delany Torres. Magíster en Ciencias mención Neurociencias, U de Valparaíso (co-tutor).
2002 Reinaldo Castillo. Magíster en Ciencias mención Neurociencias, U de Valparaíso (co-tutor)
2001 Consuelo Hernández. Maestría en Biofísica, Universidad de Colima, México

Doctoral degree

2011-2016 Ignacio Díaz-Franulic. Doctorado en Ciencias mención Neurociencias, U de Valparaíso.
2005-2009 Vivian González-Pérez. Doctorado en Ciencias mención Neurociencias, U de Valparaíso.
2004-2008 Silvina Gayol. Doctorado en Biología Celular, Molecular y Neurociencia, Universidad de Chile.
2005-2008 Francisco Palma. Doctorado en Ciencias mención Neurociencias, U de Valparaíso (co-tutor)

Postdoctoral

2015-2018 Hans Moldenhauer
2017-2017 Estefanía Hugo
2009-2010 Vivian González-Pérez
2008-2009 Silvina Gayol
1998-1999 Esperanza García.

Indexed Publications (ISI-WOS)

1. **D. Naranjo**, I Diaz-Franulic. 2023. Sweetening K-channels: what sugar taught us about permeation and gating. *Frontiers in Molecular Biosciences* 10, 1063796
2. **D. Naranjo.** 2022. A scenario for the origin of life: Volume regulation by bacteriorhodopsin required extremely voltage sensitive Na-channels and very selective K-channels. *BioEssays* 44 (10), 2100210.
3. **D. Naranjo**, I Díaz-Franulic. 2020. Binding of κ-Conotoxin-PVIIA to Open and Closed Shaker K-Channels Are Differentially Affected by the Ionic Strength. *Marine drugs* 18 (11), 533.
4. Moldenhauer H, Díaz-Franulic I, Poblete H & **D. Naranjo.** 2019. Trans-toxin ion-sensitivity of charybdotoxin-blocked potassium-channels reveals unbinding transitional states. 2019. *Elife*. 8:e46170.
5. Díaz-Franulic I., González-Pérez V., Moldenhauer H., Navarro-Quezada N. & **D. Naranjo.** 2018. Gating-induced large aqueous volumetric remodeling and aspartate

tolerance in the voltage sensor domain of Shaker K+ channels. *Proc Natl Acad Sci USA* 115:8203-8208.

6. Moldenhauer, H., Díaz-Franulic, I., González-Nilo F. & **D. Naranjo**, 2016. Effective pore size and radius of capture for K+ ions in K-channels. *Scientific Reports.* 2:19893
7. **Naranjo D.**, Moldenhauer H, Pincuntureo M. & I. Díaz-Franulic. 2016. Pore size matters for potassium channel conductance. *The Journal of General Physiology* 148:277-291.
8. **Naranjo D.**, Wen H. & P. Brehm. 2015. Zebrafish CaV2.1 calcium channels are tailored for fast synchronous neuromuscular transmission. *Biophysical Journal*. 108:578-584.
9. Díaz-Franulic, I., Sepúlveda R., Navarro-Quezada N., González-Nilo F. & **D. Naranjo**. 2015. Pore dimensions and the role of occupancy in unitary conductance of Shaker K-channels. *The Journal of General Physiology*. 146:133-146.
10. González C., Baez-Nieto D., Valencia I., Oyarzún I., Rojas P., **Naranjo D**. & R. Latorre. 2012. K^+ channels: Function-Structural Overview. *Comprehensive Physiology.* 2:2087-2149.
11. Moscoso C., Vergara-Jaque A., Márquez-Miranda V., Sepúlveda R. V., Valencia I., Díaz-Franulic I., González-Nilo F. & **D. Naranjo**. 2012. K^+ conduction and Mg^{2+} blockade in an unusually high conductance Kv channel single point mutant. *Biophysical Journal*. 103:1198-1207.
12. Cortés C., Eugenin E., Aliaga E., Carreño L.J., Bueno S.M., Gonzalez P.A., Gayol S., **Naranjo D.**, Noches V., Marassi M.P., Rosenthal D., Jadue C., Ibarra P., Keitel C., Wohllk N., Court F., Kalergis A.M. & C.A. Riedel. 2012. Hypothyroidism in the adult rat causes incremental changes in brain-derived neurotrophic factor, neuronal and astrocyte apoptosis, gliosis, and deterioration of postsynaptic density. *Thyroid*. 22:951-963.
13. González-Pérez V., Stack K., Boric K. & **Naranjo**, **D.** 2010. Reduced voltage sensitivity in a K+-channel voltage sensor by electric field remodeling. *Proc Natl Acad Sci USA*. 107:5178-5183
14. Opazo M.C., Gianini A., Pancetti F., Azkcona G., Alarcon L., Lizana R., Noches V., Gonzalez P.A., Marassi M.P., Mora S., Rosenthal D., Eugenin E., **Naranjo D.**, Bueno S.M., Kalergis A.M. & Riedel, C.A. 2008. Maternal hypothyroxinemia impairs spatial learning and synaptic nature and function in the offspring. *Endocrinology* 149, 5097-5106.
15. Gonzalez-Gutierrez G., Miranda-Laferte E., **Naranjo D.**, Hidalgo P. & A Neely. 2008. Mutations of nonconserved residues within the calcium channel alpha1-interaction domain inhibit beta-subunit potentiation. *The Journal of General Physiology* 132, 383-395.
16. Gonzalez-Perez,V., Neely A., Tapia C., Gonzalez-Gutierrez G., Contreras G., Orio P., Lagos V., Rojas G., Estevez T., Stack K. & **Naranjo D.** 2008. Slow inactivation in Shaker K channels is delayed by intracellular tetraethylammonium *The Journal of General Physiology* 132, 633-650.

17. Ardiles A.O., González-Jamett A.M., Maripillán J., **Naranjo D.**, Caviedes P. & A.M. Cárdenas. 2007. Calcium channel subtypes differentially regulate fusion pore stability and expansion. *J Neurochemistry*. 103:1574-1581.
18. Oliva C., González V. & **D. Naranjo**. 2005. Slow inactivation in voltage gated potassium channels is insensitive to the binding of pore occluding peptide toxins. *Biophysical Journal*. 89:1009-1019.
19. Saldaña C., **Naranjo. D.**, Coria R., Peña A. & L. Vaca. 2002. Splitting the two pore domains from TOK1 results in two cationic channels with novel functional properties. *Journal of Biological Chemistry.* 277:4797-7805.
20. **Naranjo D.** 2002. Inhibition of Single Shaker K Channels by κ-Conotoxin-PVIIA. *Biophysical Journal*. 82:3003-3011.
21. **Naranjo D.** & E. García. 2000. A marine snail κ-conotoxin blocks the pore of K+ channels as α-KTX scorpion toxins do. *Journal of Physiology-London.* 523, 2S-3S
22. García E., Scanlon M. & **D. Naranjo.** 1999. A marine snail toxin shares with scorpion toxins a convergent mechanism of blockade on the pore of voltage-gated K channels. *The Journal of General Physiology*. 114:141-157.
23. Scanlon M., **Naranjo D.**, Thomas L., Alewood P., Lewis R. & D. Craik. 1997. Solution structure and proposed binding mechanism of a novel potassium channel toxin κ-conotoxin PVIIA. *Structure*. 5:1585-1597.
24. **Naranjo D.** & C. Miller. 1996. A strongly interacting pair of residues on the contact surface of charybdotoxin and a Shaker K+ channel. *Neuron*. 16:123-130
25. Armisén R., Sierralta J., Vélez P., **D. Naranjo** & B. A. Suárez-Isla. 1996. Modal gating in neuronal and skeletal muscle ryanodine-sensitive Ca2+ release channels. *American Journal of Physiology*. 271C:144-153.
26. **Naranjo D.**, R. Latorre D. Cherbavaz, P. McGill & M. Schumaker. 1994. A simple model for surface charge on ion channel proteins. *Biophysical Journal.* 66:59-70.
27. **Naranjo D.**, Plant C., Dunlap K. & P. Brehm. 1994. Two subcellular mechanisms underlie calcium-dependent facilitation of bioluminescence. *Neuron*. 3:1293-1301.
28. **Naranjo D.** & P. Brehm. 1993. Modal shifts in acetylcholine receptor channel gating confer subunit-dependent desensitization. *Science*. 260:1811-1814
29. **Naranjo**. **D.**, & R. Latorre. 1993. Ion conduction in substates of the batrachotoxin-modified Na+ channel from toad skeletal muscle. *Biophysical Journal.* 64:1038-1050.
30. Latorre R., Labarca P. & **D. Naranjo**. 1992. Surface charge effects on ion conduction in ion channels. *Methods in Enzymology*. 207:471-501.

Capítulos en libros

Naranjo, D. 2004. Peptide toxins as conformational probes for K-channels. In: *Pumps, Transporters and Ion Channels: Studies on their Structure, Function, and Cell Biology*. (Eds. F. Sepúlveda y F. Bezanilla). Kluwer Academic/Plenum Press, New York. Pp. 103-112.

Naranjo, **D.** 1997. Assembly of Shaker K-channels from random mixture of subunits carrying different mutations. In*: From ion-channels to cell-to-cell conversation.* (Eds. R. Latorre and J.C. Saez). Plenum Press, NY, 1997. pp.35-46.