Curriculum vitae

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EDUCATION

- 2016: Ph.D. in Applied Sciences. Universidad de Talca, Chile.
- 2012: B.Sc. In Pharmaceutical Chemistry. Universidad Nacional de Colombia, Colombia.
- 2009: B.Sc. in Chemistry. Universidad Distrital Francisco José de Caldas, Colombia.

POSTDOCTORAL TRAINING

- 2017 – 2018: Postdoctoral fellow at Dr. José Argüello Laboratory. Department of Chemistry and Biochemistry, Worcester Polytechnic Institute, USA.
- 2016 – 2017: Postdoctoral fellow at Dr. Wendy González Laboratory. Centro de Bioinformática y Simulación Molecular, Universidad de Talca, Chile.

APPOINTMENTS

- 2019 – current: Assistant Professor, Faculty of Health Sciences. Instituto de Ciencias Biomédicas, Universidad Autónoma de Chile, Santiago, Chile.
- 2018: Visiting Professor, Faculty of Sciences, Universidad Antonio Nariño. Bogotá, Colombia.
- 2017: Assistant Professor, Faculty of Health Sciences, Universidad Autónoma de Chile, Talca, Chile.
- 2017: Visiting Professor, Department of Pharmacy, Faculty of Sciences, Universidad Nacional de Colombia.
- 2015 – 2016: Research Assistant: Center for Bioinformatics and Molecular Simulations, Universidad de Talca, Chile. Advisor: Dr. Wendy González.
- 2015 – 2016: Research Assistant: Center for Bioinformatics and Molecular Simulations, Universidad de Talca, Chile. Advisor: Dr. Ingo Dreyer.

REFERRED JOURNAL ARTICLES

31. Kiper, A., Bedoya, M., Stalke, S., Marzian, S., Ramírez, D., Cruz, A., Peraza, D., Vera-Zambrano, A., Márquez-Montesinos, J., Arévalo, B., Rinné, S., González, T., Valenzuela, C., González, W., and Decher, N. Identification of a critical binding site for local anesthetics in the side pockets of Kv1 channels. British Journal of Pharmacology, (2021) https://doi.org/10.1111/bph.15480.

30. Ginex, T., Garaigorta, U., **Ramírez, D.,** Castro, V., Nozal, V., Maestro, I., García-Cárceles, J., Campillo, N., Martinez, A., Gastaminza, P., and Gil, C. Host-Directed FDA-Approved Drugs with Antiviral Activity against SARS-CoV-2 Identified by Hierarchical In Silico/In Vitro Screening Methods. Pharmaceuticals, (2021) 14, 332.

29. Valdés-Jiménez, A., Peña-Varas, C., Borrego-Muñoz, P., Arrue, L., Alegría-Arcos, M., Nour-Eldin, H., Dreyer, I., Nuñez-Vivanco, G., & **Ramírez, D.** Targeting nuclear protein PSC-db: A Structured and Searchable 3D-Database for Plant Secondary Compounds. Molecules, (2021) 26(4), 1124.

28. Rojas-Prats, E., Martinez-Gonzalez, L., Gonzalo-Consuegra, C., Liachko, N., Perez, C., **Ramírez, D**., Kraemer, B., Martin-Requero, A., Perez, D., Gil, C., Lago, E., & Martinez, A. Targeting nuclear protein TDP-43 by cell division cycle kinase 7 inhibitors: A new therapeutic approach for amyotrophic lateral sclerosis. European Journal of Medicinal Chemistry, (2021) 210, 112968.

27. Pérez-Reytor, D., Pavón, A., Lopez-Joven, C., Ramírez-Araya, S., Peña-Varas, C., Plaza, N., Alegría-Arcos, M., Corsini, G., Jaña, V., Pavez, L., Pozo, T., Bastías, R., Blondel, C., **Ramírez, D**., & García, K. (2020). Analysis of the zonula occludens toxin found in the genome of the Chilean non-toxigenic Vibrio parahaemolyticus strain PMC53.7. (*Accepted*) Frontiers Cellular and Infection Microbiology.

26. Gil, C., Ginex, T., Maestro, I., Nozal, V., Barrado-Gil, L., Cuesta-Geijo, M. A., Urquizá, J., **Ramírez, D.**, Campillo, N., & Martínez, A. (2020). COVID-19: Drug targets and potential treatments. Journal of Medicinal Chemistry. https://doi.org/10.1021/acs.jmedchem.0c00606.

25. Bustos, D., Bedoya, M., **Ramírez, D**., Concha, G., Zúñiga, L., Decher, N., Hernández-Rodríguez, E., Sepúlveda, F., Martínez, L., and, González, W. Elucidating the Structural Basis of the Intracellular pH Sensing Mechanism of TASK-2 K2P Channels. International Journal of Molecular Sciences (*2020*), 21(2), 532.

24. Santos, P., **Ramírez, D**., Caballero, J., Espinosa, D., Hernandez, R., Soto, C., and, Vallejo, F. Identification of Mycobacterium tuberculosis CtpF as a target for designing new antituberculous compounds. Bioorganic & Medicinal Chemistry (*2020*), 28(3), 115256.

23. Morales-Navarro, S., Prent-Peñaloza, L., Rodríguez, Y., Sánchez-Aros, L., Forero-Doria, O., González, W., Campilllo, N., Reyes-Parada, M., Martínez, A., and **Ramírez, D**. Theoretical and Experimental Approaches Aimed at Drug Design Targeting Neurodegenerative Diseases. Processes (*2019*), 7, 940.

22. Ramírez, D.; Concha, G., Arévalo, B., Prent-Peñaloza, P., Zúñiga, L., Kiper, A., Rinné, S., Reyes-Parada, M., Decher, N., González, W. and Caballero, J. Discovery of Novel TASK-3 Channel Blockers Using a Pharmacophore-Based Virtual Screening. International Journal of Molecular Sciences. (*2019*) 20(16), 4014.

21. Bedoya, M.; Rinné, S.; Kiper, A. K.; Decher, N.; González, W.; **Ramírez, D.** TASK Channels Pharmacology: New Challenges in Drug Design. Journal of Medical Chemistry. (2019) 62, 22, 10044–10058.

20. Ramírez, D.; Bedoya, M.; Kiper, A. K.; Rinné, S.; Morales-Navarro, S.; Hernández-Rodríguez, E. W.; Sepúlveda, F. V; Decher, N.; González, W. Structure / Activity Analysis of TASK-3 tetrahydropyrido [4,3-d] pyrimidine. International Journal of Molecular Sciences. (*2019*) 20(9), 2252.

19. Rinné, S., Kiper, A., Vowinkel, K., **Ramírez, D.,** Schewe, M., Bedoya, M., Aser, D., Gensler, I., Netter, M., Stansfeld, P., Baukrowitz, T., Gonzalez, W., and Decher, N. The molecular basis for an allosteric inhibition of K^+-flux gating in K_{2P} channels. *eLife* (*2019*) 8:e39476.

18. Novoa-Aponte, L., **Ramírez, D.,** and Argüello, J. The interplay of the metallosensor CueR with two distinct CopZ chaperones defines copper homeostasis in *Pseudomonas aeruginosa*. *Journal of Biological Chemistry*, (*2019*) 294(13), 4934-4945.

17. Forero-Doria, O., Castro, R., Guitierrez, M., González-Valenzuela, D., Santos, L., **Ramírez, D.**, & Guzman, L. Synthesis of ionic liquids as a new antibacterial alternative to pathogens of the skin and soft tissues. Molecules (*2018*) 23, 2354

16. Ramirez, D., Zuñiga, R., Concha, G., & Zuñiga, L. HCN channels: New therapeutic targets for pain treatment. Molecules (*2018*) 23, 2094.

15. Parmar, J., Quintana, J., **Ramírez, D.,** Laubenbacher, R., Argüello, & Mendes, P. An important role for periplasmic storage in Pseudomonas aeruginosa copper homeostasis revealed by a combined experimental and computational modeling study. Molecular microbiology (*2018*) 00, 1-13.

14. Ramirez, D., Caballero, J. Is it reliable to take the molecular docking top first scoring position as the best solution without considering available structural data? Molecules (*2018*) 23(5), 1038.

13. Ramirez, D., González, W., Fissore, R., & Carvacho, I. Conotoxins as Tools to Understand the Physiological Function of Voltage-Gated Calcium (Ca_V) Channels. Marine drugs (*2017*) 15, 313.

12. Ojeda, P. G., **Ramírez, D.,** Alzate-morales, J., Caballero, J., Kaas, Q., & González, W. Computational Studies of Snake Venom Toxins. Toxins, (*2017*) 10(8), 1–24.

11. Ramirez, D., Arévalo, B., Martínez, G., Rinné, S., Sepúlveda, F., Decher, N. & González, W. Side fenestration provide and 'anchor' for stable binding of A1899 to the pore of TASK-1 potassium channel. Molecular Pharmaceutics (*2017*) 14(7):2197–2208.

10. Jørgensen, M., Xu, D., Crocoll, C., **Ramírez, D.,** Motawia, M., Olsen, C., Nour-Eldin, H., & Halkier, B. Origin and evolution of a transporter substrate specificity. eLife (2017) 6:e19466.

9. Resende, L., Ramos, R., Collaço, R., Simioni, L., **Ramirez, D.,** Gonzalez, W., Soares, A., Calderon, L., Marangoni, S., and Da Silva, D. Exploring and understanding the functional role, and biochemical and structural characteristics of an acidic phospholipase A2, AplTx-I, purified from Agkistrodon piscivorus leucostoma snake venom. Toxicon 127 (*2017*) 22-36.

8. Almeida, J., Lancellotti, M., Soares, A., Calderon, L., **Ramírez, D.,** González, W., Marangoni, S., and Da Silva, S. CoaTx-II, a new dimeric Lys49 phospholipase A2 from Crotalus oreganus abyssus snake venom with bactericidal potential: Insights into its structure and biological roles. Toxicon 120 (*2016*) 147-158

7. Rodríguez Y., Gutiérrez M., **Ramírez D.,** Alzate-Morales J., Bernalc C., Güizac F., Romero A. Novel N-allyl/propargyl tetrahydroquinolines: Synthesis via three-component cationic imino Diels- Alder reaction, binding prediction and evaluation as cholinesterase inhibitors. Chemical Biology & Drug Design. (*2016*) 88(4), 498-510.

6. Ramírez D., Caballero J. Is it reliable the use of common molecular docking methods to compare the binding affinities of pair of enantiomers to their protein target? International Journal of Molecular Sciences (*2016*) 17, 4.

5. Ramírez D. Computational methods applied to rational drug design. The Open Medical Chemistry Journal (*2016*) 10:35-48

4. Goldstein1 M., Rinné S., Kiper A., **Ramírez D.,** Netter M., Bustos D., Ortiz-Bonnin D., González W., Decher N. Functional mutagenesis screens reveal the 'cap structure' formation in disulfide-bridge free TASK channels. Scientific Reports (*2016*), 6, 19492.

3. Kiper A., Rinné S., rolfes C., **Ramírez D.,** Seebohm G., Netter M., González W., Decher N. Kv1.5 blockers preferentially inhibit TASK-1 channels: TASK-1 as a target against atrial fribrillation and obstructive sleep apnea? Pflügers Archiv – European Journal of Physiology. (*2015*) 467;1081-1090.

2. González W., Valdebenito B., Caballero J., Riadi G., Riedelsberger J., Martínez G., **Ramírez D**., Zuñiga L., Sepúlveda F., Dreyer I., Janta M., Becker D. K2P channels in plants and animals. Pflügers Archiv – European Journal of Physiology. (*2015*) 467;1091-1104.

1. Sabogal-Arango A., Barreto G., **Ramírez D.,** González-Mendoza J., Barreto V., Morales L. & González J. Computational insights of the interaction among Sea anemones Neurotonxins and Kv1.3 Channels. Bioinformatics and Biology insights (*2014*) 8;73-81

GRANTS

- 2020 – 2021: Reposicionamiento de medicamentos para tratamiento de la pandemia por coronavirus (COVID-19). Principal Investigator. Agencia Nacional de Investigación y Desarrollo de Chile (ANID). Grant No. COVID0199. Funding: $ 123.000 USD
- 2021 – 2022: Actualización de los servicios de ANSEP (*Astrocyte-neuron simulation environment platform*) bajo el estudio integrativo de enfermedades neurodegenerativas. COLCIENCIAS – Pontificia Universidad Javeriana, Colombia. Co-investigator.
- 2020 – 2021: Target- and ligand-based drugs to control SARS-CoV-2 pandemic (CoV2Drugs). Consejo Superior de Investigaciones Científicas, España. Grant No. CSIC-COV19-015. Co-investigator.
- 2020 - 2022: Call for proposals for the generation of new knowledge through scientific research projects in medical and health sciences. COLCIENCIAS – Pontificia Universidad Javeriana, Colombia. Grant No. 67270. "*Identificación de reacciones controladoras de lipotoxicidad inducida por ácido palmítico en un modelo computacional multi-ómico astrocitario*." Co-investigator. Funding: $ 90.000 USD
- 2020 - 2021: Conicyt grant No. REDES190074. "*Multi-target drug desing against neurodegenerative diseases*." Principal Investigator. Funding: $ 16.000 USD
- 2020 - 2021: Conicyt grant No. REDES190025, "*INSECTR – International network to study secondary metabolite transport in plants*." Associate investigator. Funding: $ 20.000 USD.

- 2019: Scholarship Programme for Young Professors and Researchers from Latin American Universities. Funding: $ 1.300 USD.
- 2018 – 2021: Fondecyt grant (No. 11180604) "*Structural insights into the substrate specificity and transport mechanisms in the Nitrate/Peptide transporter (NPF) family*". Principal Investigator. Funding: $ 145.000 USD.
- 2017: Convocatoria para proyectos de ciencia, tecnología e innovación en salud COLCIENCIAS – Pontificia Universidad Javeriana, Colombia. "*Análisis metabolómico de los efectos neuroprotectores de la tibolona en un modelo astrocitico humano de lipotoxicidad con ácido palmítico*" International Advisor. Funding: $ 95.000 USD
- 2016: International Mobility Scholarship: Talca University, Chile – Copenhagen University, Denmark. Principal Investigator. Funding: $ 13.000 USD.

PATENS

Ramírez D., Zuñiga R., Valenzuela C., Caballero J., González W., Brown N., Zuñiga L. Compuestos inhibidores de canales de potasio tipo TASK. Chilean Provisional Pat. Ser. No. 201701280. INAPI, Ministerio de Economía, Fomento y Turismo. Gobierno de Chile. Pending.

GRADUATE THESIS ADVISOR

- 2020 – current: José Carlos Márquez. PhD program in Science - mention Chemical and Biological Systems Modeling, Universidad de Talca. *Consensual local anesthetic binding site among atrial fibrillation relevant ion channels*.
- 2020 – current: Lily Arrué. MSc program in Neurosciences, Universidad Autónoma de Chile. *Targeting Alzheimer's disease through computational polypharmacology*.
- 2020 – current: José Catalan. MSc program in Neurosciences, Universidad Autónoma de Chile.

UNDERGRADUATE THESIS ADVISOR

- 2020 – current: Jordán Alegría. Department of Pharmacy. Universidad Autónoma de Chile. Study of polypharmacological profiles in key targets against Alzheimer disease.
- 2018: Laura Sánchez. Department of Chemistry, Universidad del Quindío. Study and identification of novel ROP18 modulators with potential therapeutic activity against *Toxoplasma gondii*.
- 2017: Carlos Peña. Bioinformatics Engineer School. Universidad de Talca. Thesis: *Structural analysis of the blocker A1899 pathway to the binding site in TASK1 potassium channels.*

TEACHING

- 2019 - current: PhD program in Biomedical Sciences, Faculty of Health Sciences, Universidad Autónoma de Chile. Bioinformatics and Molecular Simulation.
- 2019 - current: MSc program in Neurosciences, Faculty of Health Sciences, Universidad Autónoma de Chile. Psychopharmacology.
- 2019 – current: Pharmacology. Faculty of health sciences, Universidad Autónoma de Chile, Chile.
- 2018: Computational methods applied to biological research. Faculty of Sciences, Universidad Antonio Nariño, Bogotá, Colombia (20 horas).
- 2017: Biophysics, Faculty of health sciences, Universidad Autónoma de Chile, Chile.
- 2017: Computational methods applied to pharmaceutic sciences. Department of Pharmacy, Faculty of Sciences, Universidad Nacional de Colombia (40 hours).
- 2014: Introduction to molecular modeling. Department of Pharmacy, Faculty of Sciences, Universidad Nacional de Colombia. Colombia (20 hours).
- 2012: Introduction to bioinformatics and computational chemistry. Department of Pharmacy, Faculty of Sciences, Universidad Nacional de Colombia. Colombia (20 hours).

ACADEMIC COMMITTEE GRADUATE PROGRAMS

- PhD program in Biomedical Sciences, Faculty of Health Sciences, Universidad Autónoma de Chile
- PhD program in Applied Sciences, Institute of Applied Chemistry, Universidad Autónoma de Chile
- MSc program in Neurosciences, Faculty of Health Sciences, Universidad Autónoma de Chile

AWARDS AND HONORS

- 2015: First price poster – 1st International Conference in Bioinformatics, Simulation and Modeling (iCBSM). Universidad de Talca, Talca, Chile.
- 2013: Scholarship for Ph.D. studies. Universidad de Talca, Chile.
- 2009: BSc. Thesis distinguished with meritorious mention. Universidad Distrital Francisco José de Caldas. Colombia.

MEMBERSHIP OF SCIENTIFIC SOCIETIES

- ISCB: International Society for Computational Biology - https://www.iscb.org/
- SOFARCHI. Sociedad Farmacológica de Chile - https://www.sofarchi.cl/
- ASBMB: American Society of Molecular Biology and Biochemistry - https://www.asbmb.org/