# CURRICULUM VITAE
## Mohammad-Reza Ghovanloo, PhD

**Version date:** 26/03/2025

**School:** Yale School of Medicine

**Education:**

09/2009-09/2015 BSc (Hons), Molecular Biology and Biochemistry, Simon Fraser University, Burnaby, BC
09/2015-02/2021 PhD, Biomedical Physiology and Kinesiology, Simon Fraser University, Burnaby, BC

**Career/Academic Appointments:**

09/2012-05/2013 Research Assistant, Aquatic Toxicology Lab, Simon Fraser University, Burnaby, BC
09/2013-09/2015 Research Assistant, Molecular Cardiac Physiology Group, Simon Fraser University, Burnaby, BC
05/2017-11/2019 Research Fellow, Cellular and Molecular Biology, Xenon Pharmaceuticals, Burnaby, BC
01/2020-04/2020 Visiting Researcher, Science for Life Laboratory, KTH Royal Institute of Technology, Stockholm, Sweden
02/2021-09/2022 Postdoctoral Associate, Department of Neurology, Yale School of Medicine, New Haven, CT
09/2022-08/2024 Postdoctoral Fellow, Department of Neurology, Yale School of Medicine, New Haven, CT
09/2024-present Associate Research Scientist, Department of Neurology, Yale School of Medicine, New Haven, CT

**Professional Honors & Recognition:**

***International/National/Regional***

2017 MSc Graduate Accelerate Fellowship, Mitacs, Vancouver, BC
2018 PhD Graduate Accelerate Fellowship, Mitacs, Vancouver, BC
2018 Second Most Read Article in Journal for the Month of September, Journal of Biological Chemistry, Rockville, MD
2019 Top 8 National Ranking, Annual National Student Paper Competition, Institute of Public Administration of Canada (IPAC), Toronto, ON
2019 Alexander Graham Bell Canada Graduate Scholarship-Doctoral (CGS-D), Natural Sciences and Engineering Research Council of Canada (NSERC), Ottawa, ON
2019 Canada Graduate Scholarship-Michael Smith Foreign Study Supplement-Doctoral (CGS-MSFSS), Natural Sciences and Engineering Research Council of Canada (NSERC), Ottawa, ON
2022 Postdoctoral Fellowship (PDF), Natural Sciences and Engineering Research Council of Canada (NSERC), Ottawa, ON
2022 Banting Postdoctoral Fellowship, Canadian Institutes of Health Research (CIHR), Ottawa, ON
2024 Featured Article on Journal Cover (Vol. 10, No. 6, Dec. 2024), Neurology Genetics, Minneapolis, MN

***University***

2015 President's Honour Roll, Simon Fraser University, Burnaby, BC
2015 Dean's Honour Roll, Simon Fraser University, Burnaby, BC
2016 Travel and Minor Research Award, Simon Fraser University, Burnaby, BC
2017 Travel and Minor Research Award, Simon Fraser University, Burnaby, BC
2017 Celebration of Authors, Simon Fraser University, Burnaby, BC
2018 Travel and Minor Research Award, Simon Fraser University, Burnaby, BC
2019 Graduate Student Society Open Access Award, Simon Fraser University, Burnaby, BC

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| 2019 | Celebration of Authors, Simon Fraser University, Burnaby, BC |
| 2019 | Travel and Minor Research Award, Simon Fraser University, Burnaby, BC |
| 2020 | Research Grant Stipend, Simon Fraser University, Burnaby, BC |
| 2020 | Graduate Fellowship, Simon Fraser University, Burnaby, BC |
| 2021 | Graduand Speaker at Convocation Ceremony, Simon Fraser University, Burnaby, BC |

**Grant/Clinical Trials History:**

***Current Grants***

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| Agency: | CIHR |
| ID#: | Banting Fellowship |
| Title: | Novel high throughput functional approach to investigate the cellular basis of sex-dependent differences in chemotherapy-induced peripheral neuropathy (CIPN) in primary dorsal root ganglia (DRG) and using cannabidiol (CBD) as a potential molecular treatment against CIPN-induced allodynia |
| PI: | Mohammad-Reza Ghovanloo, PhD |
| Percent effort: | 80% |
| Total costs: | $103,000 (includes indirects) |
| Project period: | 09/01/2022 – 09/01/2024 |

***Past Grants***

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| Agency: | MITACS |
| ID#: | Accelerate |
| Title: | Effects of various compounds on central nervous system neurons as potential therapeutics against epilepsy |
| PI: | Mohammad-Reza Ghovanloo, PhD |
| Percent effort: | 50% |
| Total costs: | $22,103 (includes indirects) |
| Project period: | 05/01/2017 – 11/01/2017 |

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| Agency: | Rare Disease Foundation and the BC Children's Hospital Foundation, |
| ID#: | Microgrant |
| Title: | Studying rare disorders associated with sodium channels |
| PI: | Peter C. Ruben, PhD |
| Percent effort: | 10% |
| Total costs: | $2,578 (includes indirects) |
| Project period: | 05/02/2017 – 11/03/2017 |

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| Agency: | MITACS |
| ID#: | Accelerate |
| Title: | Determining the effects of gating modifier compounds on cultured central nervous system neurons as potential therapeutics against epilepsy |
| PI: | Mohammad-Reza Ghovanloo, PhD |
| Percent effort: | 50% |
| Total costs: | $66,309 (includes indirects) |
| Project period: | 11/01/2017 – 11/09/2019 |

**Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated with Yale:**

***International/National***

1. "SCN4A Mutation Causing Periodic Paralysis & Myotonia: Exercise as a Trigger, & Cannabidiol as a Treatment." Griffith University: International Student Research Forum. Gold Coast, Queensland, Australia, 2018.
2. "Biophysical characterization of a novel CPVT-causing SCN5A mutation: T1857I." Gordon Research Seminar, Cardiac Arrhythmia Mechanisms, Renaissance Tuscany II Ciocco in Lucca, Italy, 2019.
3. "Inhibitory effects of cannabidiol on voltage-dependent sodium currents." Sophion User Meeting, Boston, MA, 2019.
4. "Mechanism of sodium channel inhibition by cannabidiol." Biophysical Society Meeting (Platform: Voltage-gated Na and Ca Channels), San Diego, CA, 2020.
5. "Interactions Between Cannabidiol and Sodium Channels." Online Meeting on Cannabis and Cannabinoids, Melbourne, Victoria, Australia (Virtual Meeting), 2020.
6. "Delineating the interactions between cannabidiol and sodium channels." Biophysical Society Satellite Meeting - A World of Opportunity: Ion Channels and Automated Patch-Clamping, MA (Virtual Meeting), 2020.
7. "Inhibition of sodium conductance by cannabigerol contributes to a reduction of neuronal dorsal root ganglion excitability." Sophion User Meeting, Boston, MA, 2021.
8. "Cannabidiol increases gramicidin current in human embryonic kidney cells: An observation study." CSEQUENCE Journal Club, Virtual Meeting, 2022.
9. "High-throughput combined voltage-clamp/current-clamp analysis of freshly isolated neurons." Sophion Webinar, Virtual Meeting, 2023.
10. "Defining populations of freshly isolated neurons using a high-throughput and unbiased approach." Northeastern Pain Symposium – Zuckerman Institute, Columbia University, New York, NY, 2023.
11. "Cannabinol functionally-selectively inhibits threshold sodium currents and reduces excitability in neurons of the dorsal root ganglion." Sophion User Meeting, Harvard Medical School, Boston, MA, 2023.

***Regional***

1. "Mixed Periodic Paralysis & Myotonia Mutant Imparts pH Sensitivity in Skeletal Voltage-gated Sodium Channels." Centre for Cell Biology, Development, and Disease, Vancouver, BC, 2017.
2. "Cannabidiol inhibits voltage-dependent sodium currents." Department of Chemistry and Chemical Biology, Harvard University, Boston, MA, 2019.

**Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated with Yale:**

***International/National***

1. **Ghovanloo, M. R.**, & Ruben, P. C. The Effects of Amiodarone and N-Desethylamiodarone on Cardiac Voltage-Gated Sodium Channels. Los Angeles, CA, USA, 2016 (Poster presentation).
2. **Ghovanloo, M. R.**, Rayani, K., & Tibbits, G. F. Thermodynamic properties of dilated cardiomyopathy (DCM) associated troponin C mutant Q50R analyzed through isothermal titration calorimetry (ITC). Ventura, CA, USA, 2017 (Poster presentation).
3. **Ghovanloo, M. R.**, Rayani, K., & Tibbits, G. F. Thermodynamic properties of dilated cardiomyopathy (DCM) associated troponin C mutant Q50R analyzed through isothermal titration calorimetry (ITC). Ventura, CA, USA, 2017 (Poster presentation).
4. **Ghovanloo, M. R.**, Rayani, K., Choudhury, K., Fouda, M. A., Rayani, K., Poburko, D., Delemotte, L., & Ruben, P. C. Mechanism of sodium channel inhibition by cannabidiol. San Diego, CA, USA, 2020 (Platform presentation).
5. **Ghovanloo, M. R.**, Shuart, N. G., Mezeyova, J., Ruben, P. C., & Goodchild, S. J. Modulation of Voltage-gated sodium Channels by Cannabidiol. South Hadley, MA, USA, 2018 (Poster presentation).

6. **Ghovanloo, M. R.** Mixed Periodic Paralysis & Myotonia Mutant, Imparts pH Sensitivity in Skeletal Voltage-gated Sodium Channels. Burnaby, BC, Canada, 2017 (Podium presentation).
7. **Ghovanloo, M. R.**, & Ruben, P. C. Mixed Periodic Paralysis & Myotonia Mutant, P1158S, Imparts pH Sensitivity in Nav1.4. New Orleans, LA, USA, 2017 (Poster presentation).
8. **Ghovanloo, M. R.**, Shuart, N. G., Mezeyova, J., Ruben, P. C., & Goodchild, S. J. Effects of Cannabidiol on Human Nav Channels. San Francisco, CA, USA, 2018 (Poster presentation).
9. **Ghovanloo, M. R.**, Shuart, N. G., Mezeyova, J., Ruben, P. C., & Goodchild, S. J. Modulation of Voltage-gated sodium Channels by Cannabidiol. South Hadley, MA, USA, 2018 (Poster presentation).
10. **Ghovanloo, M. R.**, Shuart, N. G., Mezeyova, J., Ruben, P. C., & Goodchild, S. J. Modulation of Voltage-gated sodium Channels by Cannabidiol. South Hadley, MA, USA, 2018 (Poster presentation).
11. **Ghovanloo, M. R.**, Atallah, J., Escudero, C. A., & Ruben, P. C. Biophysical characterization of a novel CPVT-causing SCN5A mutation: T1857I. Lucca, Italy, 2019 (Poster presentation).
12. **Ghovanloo, M. R.**, Atallah, J., Escudero, C. A., & Ruben, P. C. Biophysical characterization of a novel CPVT-causing SCN5A mutation: T1857I. Lucca, Italy, 2019 (Poster presentation).
13. Fouda, M. A., **Ghovanloo, M. R.**, & Ruben, P. C. Protective Effect of Cannabidiol Against Oxidative Stress and Cytotoxicity Evoked by High Glucose in Cardiac Voltage-Gated Sodium Channels. San Diego, MA, USA, 2020 (Poster presentation).
14. Goodchild, S. J., **Ghovanloo, M. R.**, Williams, A., Shuart, N., Soriano, M., Mezeyova, J., Dean, R., Focken, T., Ruben, P. C., Empfield, J., Cohen, C. J., & Johnson, J. P. Targeting of NaV1.6 and NaV1.2 to Inhibit Excitatory vs Inhibitory Neural Circuits. San Diego, CA, USA, 2020 (Platform presentation).
15. **Ghovanloo, M. R.**, Bandaru, T. S., Choudhury, K., Fouda, M. A., Rayani, K., Poburko, D., Delemotte, L., & Ruben, P. C. Mechanism of sodium channel inhibition by cannabidiol. San Diego, CA, USA, 2020 (Platform presentation).
16. Roston, T. M., Fouda, M. A., **Ghovanloo, M. R.**, Atallah, J., Plumereau, Q., Peltenburg, P., Davies, B., Pouliot, V., Holl, M., Jespersen, C. B., Steinberg, C., Knight, L. M., Escudero, C. A., Christian, S., MacIntyre, C., Fischbach, P. S., Tfelt, J., Yap, S.-C., Sanatani, S., Roberts, J. D., Wilde, A. A. M., Chahine, M., Ruben, P. C., & Krahn, A. D. Clinical and functional characterization of SCN5A variants linked to adrenergic ventricular arrhythmia: a multicenter study. Boston, MA, USA, 2021 (Poster presentation).
17. **Ghovanloo, M. R.**, Estacion, M., Zhao, P., Dib-Hajj, S., & Waxman, S. G. Cannabigerol inhibits sodium conductance to reduce neuronal dorsal root ganglion excitability. San Francisco, CA, USA, 2022 (Poster presentation).
18. **Ghovanloo, M. R.**, Tyagi, S., Zhao, P., Kiziltug, E., Estacion, M., Dib-Hajj, S., & Waxman, S. G. A novel high throughput combined voltage-clamp/current-clamp analysis of single primary neurons. San Diego, CA, USA, 2023 (Poster presentation).
19. **Ghovanloo, M. R.**, Effraim, P. R., Tyagi, S., Zhao, P., Dib-Hajj, S., & Waxman, S. G. Cannabinol selectively functionally inhibits threshold sodium currents and reduces excitability in neurons of the dorsal root ganglion. Washington DC, USA, 2023 (Poster presentation).
20. **Ghovanloo, M. R.**, Effraim, P. R., Tyagi, S., Cheng, X., Yuan, J.-H., Schulman, B. R., Jacobs, D. S., Dib-Hajj, S., & Waxman, S. G. TRPM8 mutations associated with persistent ocular pain after refractive surgery: D665N & V915M. Philadelphia, PA, USA, 2024 (Poster presentation).

***Regional***

1. **Ghovanloo, M. R**., Abdelsayed, M., & Ruben, P. C. The Effects of Amiodarone and N-Desethylamiodarone on Cardiac Voltage-Gated Sodium Channels. Burnaby, BC, Canada, 2016 (Poster presentation).

**Professional Service**

***Peer Review Groups/Grant Study Sections:***

2023-present Member, Doctoral Research Awards, CIHR

***Journals:***

Editorial Boards

2021-present Editor, *Frontiers in Physiology*
2022-2023 Guest Associate Editor, *Frontiers in Physiology*
2022-2023 Guest Associate Editor, *Frontiers in Pain Research*

Reviewer

*Journal of General Physiology, European Journal of Pharmacology, Journal of Pain Research, Neuropharmacology, Frontiers in Neurology, Cell Reports, Frontiers in Cellular Neuroscience, Cannabis and Cannabinoid Research, PloS One, Scientific Reports, British Journal of Pharmacology*

***Professional Organizations:***

Biophysical Society

2016-present Member

Society for Neuroscience

2023-present Member

***Simon Fraser University:***

University Committees

2015-2016 Departmental Rep, Teaching Student Staff Union, Simon Fraser University
2018-2018 Member, Search Committee for Executive Director of Student Affairs, Simon Fraser University

**Public Service / Media Presence:**

***Public Service:***

2010-2010 Volunteer at Evergreen House long-term care facility in North Vancouver, BC
2015-2016 Volunteer personal photographer for a Member of Parliament of Canada at community events in West Vancouver, BC
2016-2021 Volunteer at Surgical Services and Care Unit, Lions Gate Hospital in North Vancouver, BC

***Media Presence:***

2017 Editorial Opinion, *Canada can show the world what strength in diversity really means*, Huffington Post
2018 Op-Ed, *Rules need to be loosened to allow researchers quicker access to cannabis*. National Post
2018 Featured Expert, *How marijuana legalization will — and won't — affect the NHL,* National Post
2018 Featured Expert, *Medical research breakthroughs at SFU,* The Peak
2020 Op-Ed, *Sweden opts for trusting citizens rather than forcing COVID-19 lockdown measures*, Toronto Star
2020 Featured Expert, *How cannabidiol may be helpful in treating diabetes-related arrhythmias,* SFU News
2020 Featured Expert, *PhD graduate's research helps answer why so many CBD health claims 'Wonder Drug or Snake Oil?',* SFU News
2020 Featured Expert, *SFU research finds clues to understanding CBD and its medicinal effects,* SFU News
2024 Featured Expert, *A New Kind of Pain Relief,* Yale Scientific Magazine

2025 Featured Expert, *Cannabinoids offer new hope for safe and effective pain relief*, Yale News

**Bibliography:**

***Peer-Reviewed Original Research***


1. **Ghovanloo MR**, Abdelsayed M, Ruben PC. Effects of Amiodarone and N-desethylamiodarone on Cardiac Voltage-Gated Sodium Channels. Front Pharmacol. 2016 Mar 1;7:39. doi: 10.3389/fphar.2016.00039. eCollection 2016. PMID: 26973526.
2. **Ghovanloo MR**, Abdelsayed M, Peters CH, Ruben PC. A Mixed Periodic Paralysis & Myotonia Mutant, P1158S, Imparts pH-Sensitivity in Skeletal Muscle Voltage-gated Sodium Channels. Sci Rep. 2018 Apr 19;8(1):6304. doi: 10.1038/s41598-018-24719-y. PMID: 29674667.
3. **Ghovanloo MR**, Shuart NG, Mezeyova J, Dean RA, Ruben PC, Goodchild SJ. Inhibitory effects of cannabidiol on voltage-dependent sodium currents. J Biol Chem. 2018 Oct 26;293(43):16546-16558. doi: 10.1074/jbc.RA118.004929. Epub 2018 Sep 14. PMID: 30219789.
4. **Ghovanloo MR**, Peters CH, Ruben PC. Effects of acidosis on neuronal voltage-gated sodium channels: Nav1.1 and Nav1.3. Channels (Austin). 2018;12(1):367-377. doi: 10.1080/19336950.2018.1539611. PMID: 30362397.
5. Fouda MA, **Ghovanloo MR**, Ruben PC. Cannabidiol protects against high glucose-induced oxidative stress and cytotoxicity in cardiac voltage-gated sodium channels. Br J Pharmacol. 2020 Jul;177(13):2932-2946. doi: 10.1111/bph.15020. Epub 2020 Mar 10. PMID: 32077098.
6. Sait LG*, Sula A*, **Ghovanloo MR***, Hollingworth D, Ruben PC, Wallace BA. Cannabidiol interactions with voltage-gated sodium channels. Elife. 2020 Oct 22;9:e58593. doi: 10.7554/eLife.58593. PMID: 33089780.
7. **Ghovanloo MR**, Atallah J, Escudero CA, Ruben PC. Biophysical Characterization of a Novel SCN5A Mutation Associated With an Atypical Phenotype of Atrial and Ventricular Arrhythmias and Sudden Death. Front Physiol. 2020 Dec 22;11:610436. doi: 10.3389/fphys.2020.610436. eCollection 2020. PMID: 33414724.
8. **Ghovanloo MR**, Choudhury K, Bandaru TS, Fouda MA, Rayani K, Rusinova R, Phaterpekar T, Nelkenbrecher K, Watkins AR, Poburko D, Thewalt J, Andersen OS, Delemotte L, Goodchild SJ, Ruben PC. Cannabidiol inhibits the skeletal muscle Nav1.4 by blocking its pore and by altering membrane elasticity. J Gen Physiol. 2021 May 3;153(5):e202012701. doi: 10.1085/jgp.202012701. PMID: 33836525.
9. **Ghovanloo MR**, Estacion M, Higerd-Rusli GP, Zhao P, Dib-Hajj S, Waxman SG. Inhibition of sodium conductance by cannabigerol contributes to a reduction of dorsal root ganglion neuron excitability. Br J Pharmacol. 2022 Aug;179(15):4010-4030. doi: 10.1111/bph.15833. Epub 2022 Apr 22. PMID: 35297036.
10. **Ghovanloo MR**, Goodchild SJ, Ruben PC. Cannabidiol increases gramicidin current in human embryonic kidney cells: An observational study. PLoS One. 2022 Aug 1;17(8):e0271801. doi: 10.1371/journal.pone.0271801. eCollection 2022. PMID: 35913948.
11. **Ghovanloo MR**, Effraim PR, Yuan JH, Schulman BR, Jacobs DS, Dib-Hajj SD, Waxman SG. Nav1.7 P610T mutation in two siblings with persistent ocular pain after corneal axon transection: impaired slow inactivation and hyperexcitable trigeminal neurons. J Neurophysiol. 2023 Mar 1;129(3):609-618. doi: 10.1152/jn.00457.2022. Epub 2023 Feb 1. PMID: 36722722.
12. **Ghovanloo MR**, Tyagi S, Zhao P, Kiziltug E, Estacion M, Dib-Hajj SD, Waxman SG. High-throughput combined voltage-clamp/current-clamp analysis of freshly isolated neurons. Cell Rep Methods. 2023 Jan 12;3(1):100385. doi: 10.1016/j.crmeth.2022.100385. eCollection 2023 Jan 23. PMID: 36814833.
13. **Ghovanloo MR**, Tyagi S, Zhao P, Effraim PR, Dib-Hajj SD, Waxman SG. Sodium currents in naïve mouse dorsal root ganglion neurons: No major differences between sexes. Channels (Austin). 2024 Dec;18(1):2289256. doi: 10.1080/19336950.2023.2289256. Epub 2023 Dec 6. PMID: 38055732.
14. Tyagi S, Higerd-Rusli GP, **Ghovanloo MR**, Dib-Hajj F, Zhao P, Liu S, Kim DH, Shim JS, Park KS, Waxman SG, Choi JS, Dib-Hajj SD. Compartment-specific regulation of NaV1.7 in sensory neurons after acute exposure to TNF-α. Cell Rep. 2024 Feb 27;43(2):113685. doi: 10.1016/j.celrep.2024.113685. Epub 2024 Jan 22. PMID: 38261513.

15. **Ghovanloo MR**, Effraim PR, Tyagi S, Zhao P, Dib-Hajj SD, Waxman SG. Functionally-selective inhibition of threshold sodium currents and excitability in dorsal root ganglion neurons by cannabinol. Commun Biol. 2024 Jan 23;7(1):120. doi: 10.1038/s42003-024-05781-x. PMID: 38263462.
16. Goodchild SJ, Shuart NG, Williams AD, Ye W, Parrish RR, Soriano M, Thouta S, Mezeyova J, Waldbrook M, Dean R, Focken T, **Ghovanloo MR**, Ruben PC, Scott F, Cohen CJ, Empfield J, Johnson JP. Molecular Pharmacology of Selective NaV1.6 and Dual NaV1.6/NaV1.2 Channel Inhibitors that Suppress Excitatory Neuronal Activity Ex Vivo. ACS Chem Neurosci. 2024 Mar 20;15(6):1169-1184. doi: 10.1021/acschemneuro.3c00757. Epub 2024 Feb 15. PMID: 38359277.
17. Tyagi S, Shah RJ, Huttler J, Kayani J, **Ghovanloo MR**, Effraim PR. Impacts of resident physician unionization on house staff compensation. PLoS One. 2024 Oct 3;19(10). doi: 10.1371/journal.pone.0308100. eCollection 2024. PMID: 39361626.
18. **Ghovanloo MR**, Effraim PR, Tyagi S, Aldrich AM, Cheng X, Yuan JH, Schulman BR, Jacobs DS, Dib-Hajj SD, Waxman SG. TRPM8 mutations associated with persistent pain after surgical injury of corneal trigeminal axons. Neurol Genet. 2024 Nov 14;10(6):e200206. doi: 10.1212/NXG.0000000000200206. eCollection 2024 Dec. PMID: 39555137.
19. **Ghovanloo MR**, Tyagi S, Zhao P, Waxman SG. Nav1.8, an analgesic target for nonpsychotomimetic phytocannabinoids. Proc Natl Acad Sci U S A. 2025 Jan 28;122(4):e2416886122. doi: 10.1073/pnas.2416886122. Epub 2025 Jan 21. PMID: 39835903.
20. **Ghovanloo MR**, Tyagi S, Effraim PR, Waxman SG. In vitro inhibition of voltage-dependent sodium currents by the antifungal drug amorolfine. *J Biol Chem.* 2025 Mar 14:108407. doi: 10.1016/j.jbc.2025.108407. Online ahead of print. PMID: 40090585.

***In Press: Peer-Reviewed Original Research/Review In Press***

1. **Ghovanloo MR**, Tyagi S, Zhao P, Kiziltug E, Estacion M, Effraim PR, Dib-Hajj SD, Waxman SG. High-throughput multiplex voltage-clamp/current-clamp evaluation of acutely isolated neurons. Nature Protocols. (Accepted. In press 2025)
2. Rayani K, Grabovac A, Chan P, Montgomery S, **Ghovanloo MR**, Sacchet MD. Preliminary evidence that brain stimulation can increase levels of dispositional mindfulness: Outcomes from a repetitive transcranial magnetic stimulation clinical trial for post-traumatic stress disorder. (Submitted 2025)
3. Tyagi S, **Ghovanloo MR**, Alsaloum M, Effraim P, Higerd-Rusli GP, Dib-Hajj F, Zhao P, Liu S, Waxman SG, Dib-Hajj SD. Targeted ubiquitination of NaV1.8 reduces sensory neuronal excitability. bioRxiv. (Submitted 2025)
4. Mis MA, Tyagi S, Akin EJ, **Ghovanloo MR,** Zhao P, Dib-Hajj F, Randall AD, Waxman SG, Dib-Hajj SD. Enhanced trafficking of an inherited erythromelalgia Nav1.7 mutant channel at a physiological temperature. (Submitted 2025).

***Peer-Reviewed Reviews, Practice Guidelines, Standards, and Consensus Statements***

1. **Ghovanloo MR**, Aimar K, Ghadiry-Tavi R, Yu A, Ruben PC. Physiology and Pathophysiology of Sodium Channel Inactivation. Curr Top Membr. 2016;78:479-509. doi: 10.1016/bs.ctm.2016.04.001. Epub 2016 Jul 5. PMID: 27586293.
2. Peters CH, **Ghovanloo MR**, Gershome C, Ruben PC. pH Modulation of Voltage-Gated Sodium Channels. Handb Exp Pharmacol. 2018;246:147-160. doi: 10.1007/164_2018_99. PMID: 29460150.
3. **Ghovanloo MR**, Ruben PC. Cannabidiol and Sodium Channel Pharmacology: General Overview, Mechanism, and Clinical Implications. Neuroscientist. 2022 Aug;28(4):318-334. doi: 10.1177/10738584211017009. Epub 2021 May 24. PMID: 34027742.
4. Fouda MA*, **Ghovanloo MR***, Ruben PC. Late sodium current: incomplete inactivation triggers seizures, myotonias, arrhythmias, and pain syndromes. J Physiol. 2022 Jun;600(12):2835-2851. doi: 10.1113/JP282768. Epub 2022 Apr 27. PMID: 35436004.
5. **Ghovanloo MR**, Dib-Hajj SD, Goodchild SJ, Ruben PC, Waxman SG. Non-psychotropic phytocannabinoid interactions with voltage-gated sodium channels: An update on cannabidiol and cannabigerol. Front Physiol. 2022 Nov 10;13:1066455. doi: 10.3389/fphys.2022.1066455. eCollection 2022. PMID: 36439273.

6. **Ghovanloo MR**, Dib-Hajj SD, Waxman SG. The evolution of patch-clamp electrophysiology: robotic, multiplex, and dynamic. Mol Pharmacol. 2024 Aug 20. doi: 10.1124/molpharm.124.000954. Online ahead of print. PMID: 39164111.

***Commentaries, Editorials, and Letters***

1. **Ghovanloo MR**, Ruben PC. Say Cheese: Structure of the Cardiac Electrical Engine Is Captured. Trends Biochem Sci. 2020 May;45(5):369-371. doi: 10.1016/j.tibs.2020.02.003. Epub 2020 Feb 24. PMID: 32311330.
2. **Ghovanloo MR**, Arnold JC, Ruben PC. Editorial: Cannabinoid interactions with ion channels, receptors, and the bio-membrane. Front Physiol. 2023 May 9;14:1211230. doi: 10.3389/fphys.2023.1211230. eCollection 2023. PMID: 37228821.

***Patents***

1. **Ghovanloo MR**, Fouda MA, Jadhav VA, Page DA, Choudhury K, Rusinova R, Phaterpekar T, Patel M, Ruben PC. Composition and Therapeutic Uses of Cannabidiol. Patent No. US-20230123654-A1.