**Education**

|  |  |  |
| --- | --- | --- |
| 2009 - 2015 | University of Victoria – Victoria, BC, Canada  Supervisor: Stephen Evans | **Ph.D Biochemistry** |
| 2005 - 2009 | *University of Victoria* – Victoria, BC, Canada  Honours Supervisor: John Taylor | **B.Sc. Microbiology** (Honours)*Graduated with distinction* |

**Employment**

|  |  |  |
| --- | --- | --- |
| 2022 - current | *University of Calgary* – Calgary, AB, Canada | **Assistant Professor** |
| 2016 - 2021 | *University of British Columbia* – Vancouver, BC, Canada. Supervisor: Filip Van Petegem | **Postdoctoral Fellow** |
| 2015 - 2016 | *University of Victoria* – Victoria, BC, Canada | **Postdoctoral Fellow** |
| 2009 - 2009 | *University of Victoria Genome BC Proteomics Centre*  *Victoria, BC, Canada* | **Research Associate** |

**Funding**

|  |  |  |  |
| --- | --- | --- | --- |
| 2024 - 2025 | UCalgary VPR Catalyst Grant with FoS matching |  | **$19,000 (CAD)** |
| 2024 - 2024 | NSERC Research Tools and Instruments |  | **$114,407 (CAD)** |
| 2023 - 2026 | Heart and Stroke New Investigator award (NIA) |  | **$190,000 (CAD)** |
| 2023 - 2028 | John R. Evans Leaders Fund CFI |  | **$375,000 (CAD)** |
| 2022 - 2027 | NSERC Discovery Grant (2022-2027) |  | ***$*197,500 (CAD)** |
| 2022 - 2025 | University Startup |  | ***$*200,000 (CAD)** |
| **Total** | **All grants led by Haji-Ghassemi** |  | **$1,018,407 (CAD)** |

**Awards**

|  |  |  |
| --- | --- | --- |
| 2023 - 2026 | Heart and Stroke New Investigator award (NIA) and McDonald Scholarship (top ranked NIA) | ***$180,000 + $10,000* (CAD)** |
| 2017 - 2021 | Canadian Institutes of Health Research Fellowship | ***$150,000* (CAD) *incl. allowance*** |
| 2016 - 2019 | Michael Smith Foundation for Health Research Award | ***$146,000* (CAD) *incl. allowance*** |
| 2019 | UBC Postdoctoral Research Day Best Oral Presentation | ***$100 + gift certificate*** |
| 2017 | Gordon Research Seminar: Excitation-Contraction Coupling, Best Oral Presentation | ***$449 + iPad*** |
| 2010-2015 | Graduate student award | ***$25,000*** |

**Research Highlights**

* **22** Peer reviewed publications (full list below) – of which 3 are in review (2X BioRxiv)
* **13 first or co-first** articles published in Q1 journals, including ***Molecular Cell***, ***Nature Chemical******Biology***, ***Science Advances***, ***Nature Communication***, and ***Journal of Biological Chemistry***
* First author review with 157 citations
* One publication with only three authors in ***Molecular Cell***
* **559 citations** thus far (as of August 28, 2024)
* One co-corresponding article in review
* One article in **Neuron** under review from collaboration with Dr. Scott Ryan at UCalgary

**Conference Organization and Chairing**

|  |  |  |
| --- | --- | --- |
| 2024 | The Sharpest New Tools in the Box, Part 1 Session Co-Chair. Protein Society Meeting (July 23-26). | **Vancouver, BC** |
| 2023 | Organizing committee for the Canadian Biophysical Society meeting (May 23-26). | **Calgary, AB** |
| 2019 | Co-chaired a session at Gordon Research Seminar: Excitation-Contraction Coupling (May 19 – 24). | **Barga, Italy** |

**Faculty, Departmental and Professional Service Activities**

|  |  |  |
| --- | --- | --- |
| 2024 | Neutral Chair MSc Defence (May 24 – Candidate: Fateme Taridashti). | ***University of Calgary*** |
| 2024 - current | Research cluster Chair for the department | ***University of Calgary*** |
| 2024 | NSERC DG external reviewer for 1501 - Genes, Cells and Molecules for the Fall 2023 competition. | ***Remote*** |
| 2024 - current | Department Head Advisory committee | ***University of Calgary*** |
| 2023 | CIHR Reviewer in training for the Biochemistry & Molecular Biology – A (BMA) panel, Fall 2023. | ***Remote*** |
| 2023 - current | Search committee member for 3 tenure track positions in data science and quantum computing. | ***University of Calgary*** |
| 2023 - 2023 | Graduate award competition committee member | ***University of Calgary*** |
| 2023 | Neutral Chair MSc Defence (Mar 16 – Candidate: Anna-Marie Lewrenz). | ***University of Calgary*** |
| 2022 | Neutral Chair MSc Defence Aug 30 – Candidate: Colin Unruh). | ***University of Calgary*** |
| 2022 - current | Undergraduate IDEAS Fund award committee | ***University of Calgary*** |

**Journal Reviewer**

|  |  |  |
| --- | --- | --- |
| 2023 | Reviewer, Editor: Gerald Zamponi | ***Channels*** |
| 2022 | Reviewer, Editor: Hans Vogel | ***Biometals*** |
| 2020 | Co-reviewer, Editor: Katarzyna Marcinkiewicz | ***Nature Communications*** |
| 2017 | Invited reviewer, Editor: Prof. Paul A Ramsland | ***Molecular Immunology*** |
| 2017 | Invited reviewer, Editor: Prof. Linda Hsieh-Wilson | ***Biochemistry*** |

**Professional Affiliations**

|  |  |  |
| --- | --- | --- |
| 2024 - current | American Society for Biochemistry and Molecular Biology |  |
| 2023 - current | Canadian Biophysical Society |  |
| 2023 - current | Arnie Charbonneau Cancer Institute |  |
| 2022 - current | Libin Cardiovascular Institute |  |
| 2022 - 2024 | Canadian Society for Molecular Biosciences |  |
| 2017 - current | Biophysical Society |  |

**Teaching Activities (up to August 2024)**

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| --- | --- | --- |
| 2024 | Guest lecturer (4 lecture-hours on ion channels) at UCalgary | ***BCEM 543 Biomembranes*** |
| 2024 | Designed a custom biochemistry graduate course (12 3 hr lectures or dry lab work/workshop) | ***BCEM 601 Tools in Struct. Biol.*** |
| 2023 - current | Course co-ordinator (30-36 lecture-hours) | ***BCEM 431 Proteins & Proteomics*** |
| 2022 | Guest lecturer (4 lecture-hours on ion channels) at UCalgary | ***BCEM 543 Biomembranes*** |
| 2019 | Guest lecturer (4 lecture-hours s on ion channels) at UBC | ***BIOC450, Membrane proteins*** |
| 2017 - 2019 | Organized workshops for students, postdocs, and researchers on different structural biology tools | **Vancouver, BC, Canada** |

**Graduate-Thesis Student Committees (N=7)**

|  |  |
| --- | --- |
| 2024 - current | Jeremiah Odagwe (Supervisor: Marie Fraser) |
| 2024 - current | Shanshan Tian (Supervisor: Wayne Chen) |
| 2024 - current | Fasih Rehman (Supervisor: Peter Facchini) |
| 2024 - current | Daniel P. Ramirez-Echemendia (Supervisor: Peter Tieleman) |
| 2024 - current | Rehnuma Sejuty (Supervisor: Joe Harrison) |
| 2024 - current | Amir Ghaemian (Supervisor: Matt (Mathilakath) Vijayan) |
| 2024 - current | Steve Sparksman (Supervisor: Peter Facchini) |

**Trainees in my laboratory (N=9)**

|  |  |  |
| --- | --- | --- |
| 2024 - current | Jakob Gorodetsky (Alberta innovates awardee) | ***Summer student*** ***Honours student*** |
| 2024 | julia kaawach-mohareb |  |
| 2024 - current | Michael Schieman (PURE awardee) | ***Summer student, Honours student*** |
| 2023 - 2024 | Chase Talarico (now Graduate student at UBC) | ***Honours student*** |
| 2023 - 2024 | Nicole Hansed | ***Honours student*** |
| 2023 - current | Megan Torres (co-supervised with Mathilakath Vijayan) | ***Postdoctoral Fellow*** |
| 2023 - 2023 | Isabel Zhao (NSERC USRA) | ***Summer student*** |
| 2022 - current | Rachi Panchal (Now a graduate student in my lab) | ***Honours student, MSc student*** |
| 2022 - current | Oleg Khassan (co-supervised with Hans Vogel) | ***MSc student*** |
| 2022 - current | Joshua Steward | ***MSc student*** |

**Trainee Conference Presentations (N=5)**

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| --- | --- | --- |
| 2024 | “Unraveling the Regulation of Plastin Proteins: A Structural Study” Annual Protein Society Meeting, Vancouver, BC, Canada | **Oleg Khassan (travel award)** |
| 2024 | “Regulation of Heart Disease-Associated SPEG Kinase Domains” Annual Protein Society Meeting, Vancouver, BC, Canada | **Joshua Steward (Poster and travel awards)** |
| 2024 | “Unraveling the Regulation of Plastin Proteins: A Structural Determination Study” Biophysical Society of Canada Meeting, Montreal, QC, Canada | **Oleg Khassan (Poster and travel awards)** |
| 2024 | “The Regulation of SPEG by Calmodulin” Biophysical Society of Canada Meeting, Montreal, QC, Canada | **Nicole Hansed (travel and IDEAS awards)** |
| 2023 | “Structure Determination of the EF-Hand Domains of Plastin Proteins” Biophysical Society of Canada Meeting, Calgary, AB, Canada | **Oleg Khassan** |

**Invited Talks (N=12)**

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| --- | --- |
| 2024 | “*Cryo-EM analysis of scorpion toxin binding to Ryanodine Receptors reveals sub-conductance that is abolished by PKA phosphorylation*”. American Society for Biochemistry and Molecular Biology Meeting, San Antonio, TX, United States |
| 2021 | “*An interdisciplinary approach to understanding the function and biology of the ryanodine receptor*”. University of Windsor, Dept. of Chemistry and Biochemistry. Windsor, ON, Canada |
| 2021 | “*Molecular basis for diamide insecticide binding to the ryanodine receptor and development of insect resistance*”. European Calcium Society Webinar. Chaired by Malene Brohus, Aalborg University, Denmark. |
| 2020 | “*Human Cardiac Voltage-Gated Calcium Channel Phosphorylation by cAMP-Dependent Protein Kinase A*” Biophysical Society Meeting‎, San Diego, CA, United States |
| 2020 | “*Regulation of Heart Channel Proteins via Stress Signaling*”. University of British Columbia, Dept. of Chemistry., Vancouver, BC, Canada. |
| 2019 | “*Modification of heart channel proteins via stress signalling*”. Postdoc Research Day Competition, The University of British Columbia, Vancouver, BC, Canada. ***Won first place.*** |
| 2019 | Invited speaker and discussion group leader at IGNITE undergraduate conference at the University of British Columbia, Vancouver, Canada. |
| 2019 | “*Structural Insights into Recognition of Ryanodine Receptors by PKA*”. Biophysical Society Meeting‎, Baltimore, MD, United States. |
| 2019 | “*The cardiac ryanodine receptor phosphorylation hotspot embraces PKA in a phosphorylation-dependent manner*”. GRC for Muscle: Excitation-Contraction Coupling, Barga, Italy. |
| 2017 | “*Probing the role of PKA and CaMKII phosphorylation on the cardiac Ryanodine Receptor (RyR2)*”. Gordon Research Seminar for Muscle: Excitation-Contraction Coupling, Les Diablerets, Switzerland. **A*warded best talk at the GRS.*** |
| 2015 | “*Antibody recognition of lipid A and ssDNA”.* 11th National Carbohydrate Symposium, Banff, AB, Canada. |
| 2015 | “*Structural basis for antibody recognition of lipid A: Insights into polyspecificity towards single stranded DNA*”. 20th Annual Graduate Student Symposium, University of Victoria, Victoria, BC, Canada. |

**Research Publications (\* denotes co-first author, trainees underlined)**

**Submitted or in progress manuscripts**

22. Stykel MG; Siripala SV; Soubeyrand E; Camargo S, Lu P, Coackley CL, **Panchal R**, So RWL, Stuart E, Joseph J, Akrioti EK, **Haji-Ghassemi O**, Taoufik E, Akhtar T, Watts JC, Ryan SD. **(2024).** G6PD deficiency triggers dopamine loss and the initiation of Parkinson’s Disease pathogenesis. *Neuron*, NEURON-D-23-01423 **[In Revision]**.

21. Joseph TT; Bu W; **Haji-Ghassemi** **O;** Chen S; Woll K; Allen PD; Brannigan G; van Petegem F; Eckenhoff RG. **(2024)** Propofol directly binds and inhibits skeletal muscle ryanodine receptor 1 (RyR1). **[Accepted in *Br J Anaesth.*** [**https://www.biorxiv.org/content/10.1101/2024.01.10.575040v1.abstract**](https://www.biorxiv.org/content/10.1101/2024.01.10.575040v1.abstract)**]**

20. Yoo R**\***; **Haji-Ghassemi** **O\***; Bader M; Xu J; McFarlane C; van Petegem F. **(2023)**. Crystallographic, kinetic, and calorimetric investigation of PKA interactions with L-type calcium channels and Rad GTPase. **[In review *J Biol Chem*,** [**https://www.biorxiv.org/content/10.1101/2023.10.24.563811v2.abstract**](https://www.biorxiv.org/content/10.1101/2023.10.24.563811v2.abstract)**]. Co-first and co-corresponding author.**

**Published**

19. Cholak S; Saville JW; Zhu X; Berezuk AM; Tuttle KS; **Haji-Ghassemi O**; Alvarado F; Van Petegem F; Subramaniam S. **(2023)**. Allosteric Modulation of Ryanodine Receptor RyR1 by Nucleotide Derivatives. ***Structure****.* 31(7): 790-800.e4.

18. **Haji-Ghassemi O**; Yu SC; Woll K; Gurrola GB; Valdivia CR; Cai W; Li S; Valdivia HH; van Petegem F. **(2023)**. Cryo-EM analysis of scorpion toxin binding to Ryanodine Receptors reveals a sub-conductance state that is abolished by PKA phosphorylation. ***Sci Adv.*** 9(21): eadf4936.

17. Qin, J; Zhang, J; Lin, L; **Haji-Ghassemi, O**; Lin, Z; Woycechowsky, KJ; Van Petegem, F; Zhang, Y; Yuchi, Z. **(2022)**. Structures of PKA-phospholamban complexes reveal a mechanism of familial dilated cardiomyopathy. ***eLife***. 11: e75346.

16. Rayani, K; Hantz, E; **Haji-Ghassemi, O**; Yueh, AL; Spuches, A; Van Petegem, F; Solaro, JR; Lindert, S; Tibbits GF. **(2022)**. The effect of magnesium on calcium binding to cardiac troponin C related hypertrophic cardiomyopathy mutants. ***FEBS J***. 289(23): 7446-7465.

15. Woll, KA\*; **Haji-Ghassemi, O\***; Van Petegem F. **(2021)**. Pathological conformations of disease mutant Ryanodine Receptors revealed by cryo-EM. ***Nat commun***. 12(1): 1-13.

14. Stringer, RN; Jurkovicova-Tarabova, B; Huang, S; **Haji-Ghassemi, O**; Idoux, R; Liashenko, A; Souza, IA; Rzhepetskyy, Y; Lacinova, L; Van Petegem, F; Zamponi, GW; Pamphlett, R; Weiss, N. **(2020)**. A rare CACNA1H variant associated with amyotrophic lateral sclerosis causes complete loss of Ca v 3.2 T-type channel activity. ***Mol brain****.* 13(1): 1-11.

13.; Ma, R\*; **Haji-Ghassemi, O\***;Ma, D\*; Jiang, H\*; Lin, L; Yao, L; Samurkas, A; Li, Y; Wang, Y; Cao, P; Wu, S; Zhang, Y; Murayama, T; Moussian, B; Van Petegem, F; Yuchi Z. **(2020)**. Structural basis for diamide modulation of ryanodine receptor. ***Nat Chem Biol.*** 16(11): 1246-1254.

12. **Haji-Ghassemi, O**; Yuchi, Z; Van Petegem, F. **(2019)**. The cardiac ryanodine receptor phosphorylation hotspot embraces PKA in a phosphorylation-dependent manner. ***Mol Cell*.** 75(1): 39-52.

11. **Haji-Ghassemi, O**; M̈uller-Loennies, S; Brooks, CL; MacKenzie, CR; Caveney, N; Van Petegem, F; Brade, L; Kosma, P; Brade, H; Evans, SV. **(2018)**. Subtle Changes in the Combining Site of the Chlamydiaceae-Specific mAb S25-23 Increase the Antibody–Carbohydrate Binding Affinity by an Order of Magnitude. ***Biochemistry***. 58(6): 714-726.

10.; Roston, T\*; **Haji-Ghassemi O\***;LaPage, MJ; Batra, AS; Bar-Cohen, Y; Anderson, C; Lau, YR; Maginot, K; Gebauer, RA; Etheridge, SP; Potts, JE; Van Petegem, F; Sanatani S. **(2018)**. Catecholaminergic polymorphic ventricular tachycardia patients with multiple genetic variants in the PACES CPVT Registry. ***Plos One***. 13(11): e0205925.

9. Blackler, RJ; López-Guzmán, A; Hager, FF; Janesch, B; Martinz, G; Gagnon, SML; **Haji-Ghassemi, O**; Kosma, P; Messner, P; Schäffer, C; Evans, SV. **(2018)**. Structural basis of cell wall anchoring by SLH domains in *Paenibacillus alvei*. ***Nat Commun***. 9(1): 3120.

8. Gagnon, SML; Legg, MSG; Polakowski, R; Letts, JA; Persson, M; Lin, S; Blake Zheng, R; Rempel, B; Schuman, B; **Haji-Ghassemi, O**; Borisova, SN; Palcic, MM; Evans, SV. **(2018)**. Conserved residues Arg188 and Asp302 are critical for active site organization and catalysis in human ABO(H) blood group A and B glycosyltransferases. ***Glycobiology***. 28(8): 624-636.

7. **Haji-Ghassemi, O**; Gilbert, M; Spence, J; Schur, MJ; Parker, MJ; Jenkins, ML; Burke, JE; van Faassen, H; Young, MN; Evans, SV. **(2016)**. Molecular basis for recognition of the cancer glycobiomarker, GalNAc(β1-4)GlcNAc (LacdiNAc) by *Wisteria floribunda* agglutinin. ***J Biol Chem***. 291(46): 24085-24095.

6. **Haji-Ghassemi, O**; Müller-Loennies, S; Rodriguez, T; Brade, L; Grimmecke, HD; Brade, H; Evans, SV. **(2016)**. The Combining Sites of Anti-lipid A Antibodies Reveal a Widely Utilized Motif Specific for Negatively Charged Group. ***J Biol Chem***. 291: 10104-10118.

5. **Haji-Ghassemi, O**; Müller-Loennies, S; Rodriguez, T; Brade, L; Kosma, P; Brade, H; Evans, SV. (2015). Structural basis for antibody recognition of lipid A: insights to polyspecificity toward single stranded DNA. ***J Biol Chem***. 290: 19629-196240.

4. **Haji-Ghassemi, O**; Blackler, RJ; Young, MN; Evans, SV. **(2015)**. Antibody recognition of carbohydrate epitopes. ***Glycobiology***. 25(9): 920-952. [**Review**]

3. Gagnon, SML; Meloncelli, PJ; Zheng, RB; **Haji-Ghassemi, O**; Johal, AR; Borisova, SN; Lowary, TL; Evans, SV. **(2015)**. High resolution structures of the human ABO(H) blood group enzymes in complex with donor analogs reveal that the enzymes utilize multiple donor conformations to bind substrates in a step-wise manner. ***J Biol Chem***. 290(45): 27040-27052.

2. **Haji-Ghassemi, O**; Müller-Loennies, S; Saldova, R; Muniyappa, M; Brade, L; Rudd, PM; Harvey, DJ; Kosma, P; Brade, H; Evans, SV. **(2014)**. Groove-type recognition of chlamydiaceae-specific lipopolysaccharide antigen by a family of antibodies possessing an unusual variable heavy chain N-linked glycan. ***J Biol Chem***. 289(24): 16644-16661.

**Book chapter**

1. **Haji-Ghassemi, O**; Gagnon, SML; Müller-Loennies, S; Evans, SV. **(2017)**. Polyspecificity of anti-lipid A antibodies and its relevance to the development of autoimmunity. M. Zouhair Atassi. Protein Reviews. ***Adv Exp Med Biol***. (18): 181-202.

**Patents**

1. The application of diamide compounds for treatment of central core disease. China. 21C52253. **2021/07/01**. Patent Status: Pending