Biographical Sketch: MG Sabbir

Name: Mohammad Golam Sabbir
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A. EDUCATION:

Institution and location	Degree	Completion/ Duration date (mm/yyyy)	Field of study
University of Calcutta, India	B.Sc	May-1993	Botany
University of Calcutta, India	M.Sc	Dec-1995	Botany/Plant molecular biology
University of Calcutta, India	B.Ed	June-1997	Education (Ed.)
Chittaranjan National Cancer Institute, University of Jadavpur, India	PhD	Dec-2007	Cancer genetics and molecular biology

B. TEACHING EXPERIENCE:

2023-Present: Asst. Professor, Department of Psychology and Neuroscience, College of Psychology, Nova Southeastern University, Fort Lauderdale, Florida.

2022-2023: Adjunct lecturer graduate courses (Fall 2022-23 Genetics/Laboratory) at Halmos College of Arts and Sciences, Nova Southeastern University, Fort Lauderdale, Florida.

2016-2021: Guest lecturer in graduate courses at the University of Manitoba: -PHAC-7132, MED-7101, PHAC-7134-A01, PHAC-7222, and IMED-7112.

2001-2008: Lecturer in Botany, in a teacher's training college Under North Bengal University, India.

C. TRAINING/POSITIONS/EMPLOYMENT:

2023-Present: Asst. Professor, Department of Psychology and Neuroscience, College of Psychology, Nova Southeastern University, Fort Lauderdale, Florida.

2022-2023: Instructor, Dept. of Pharmaceutical Sciences, Health Professions Division, Barry & Judy Silverman College of Pharmacy, Nova Southeastern University, Fort Lauderdale, Florida.

2018-2022: Research Associate, Canadian Centre for Agri-Food Research in Health and Medicine (CCARM), SBRC, Winnipeg, MB, Canada

2014-2018: Research Associate, Division of Neurodegenerative Disorders, St. Boniface Hospital Albrechtsen Research Centre (SBRC), Canada

2013-2014: Postdoctoral research fellow, Department of Biochemistry and Medical Genetics, University of Manitoba, Canada

2011-2013: Postdoctoral research fellow, Manitoba Institute of Child Health, Canada

2007-2011: Postdoctoral research fellow, Manitoba Institute of Cell Biology, Canada

2001-2008: Lecturer, Siliguri B.Ed. College, University of North Bengal, WB, India

2000-2007: Ph.D. fellow, Chittaranjan National Cancer Institute, India

1996-1999: Research assistant, University of Calcutta, India

D. CONTRIBUTIONS TO SCIENCE:

CANCER RESEARCH:

I began my journey in scientific research with a Ph.D., aiming to unravel the molecular mechanisms behind carcinogenesis. This involved mapping the frequently deleted regions on chromosomes 13q and 3p to identify potential new human tumor suppressor genes (TSGs) **[1-2].** As my research progressed, I refined my skills in developing transgenic mouse models. This expertise enabled me to investigate the role of the Deleted in Liver Cancer 1 (Dlc1) gene, shedding new light on its epigenetic regulation during tumorigenesis **[3-5].**

NEUROSCIENCE RESEARCH:

1. **Muscarinic Receptor Signaling in Neurons**: My research journey has been deeply rooted in unraveling the intricacies of muscarinic receptor type 1 (M1) signaling within neurons. As a pivotal member of a dedicated research group, I contributed significantly to the development of small molecules (ligands) aimed at modulating M1 signaling to foster neurite outgrowth, particularly for diabetic neuropathy treatment. Our collaborative efforts yielded groundbreaking results, elucidating the intricate signal transduction pathways initiated by antagonist-M1 interactions, resulting in a dose-dependent increase in neurite outgrowth, both in vitro and in vivo. Our pioneering findings were published in the esteemed Journal of Clinical Investigation [6], and the promising drugs are presently undergoing evaluation in a clinical trial.

   Notably, my research uncovered a novel signaling pathway, wherein these antagonistic compounds sequester G-proteins, thereby safeguarding peripheral neurons from the inhibitory effects of excessive cholinergic signaling, which often hindered their growth [7]. Furthermore, my work challenged previous characterizations of M1 antagonists (MT7 and pirenzepine) by revealing their behavior as biased agonists, rather than mere antagonists [8]. Additionally, using a comprehensive dataset of post-mortem human brain tissues, I recently made a significant breakthrough by demonstrating a substantial reduction in M1 receptor levels in the temporal cortex and hippocampus of a subset of Alzheimer's patients. This reduction was found to correlate with poorer patient survival, offering a potential explanation for the limited efficacy observed in acetylcholine esterase inhibitor-based treatments for Alzheimer's disease [9]. Currently, my research focus is directed towards characterizing the underlying causes of M1 protein loss during Alzheimer's pathogenesis and developing novel therapeutic strategies in this context..

2. **Alzheimer's Disease (AD):** My independent research efforts have also delved into the complex realm of AD. I made a significant discovery, unveiling a novel signaling pathway linking abnormal transferrin trafficking, a crucial iron transporter protein, to dysfunctional CAMKK2 in the brain—a mechanism intricately tied to AD. This groundbreaking study led to the identification of a novel peripheral biomarker for AD in humans, with my findings published in three prestigious research articles featured in Frontiers in Molecular Bioscience, Cell Communication and Signaling, and BBA Molecular Cell Research [10-12]. The innovation did not stop there; our work has been patented under the title "WO2020069621 - A novel biomarker for Alzheimer's disease in humans."

To drive this innovation towards real-world impact, I took the initiative to establish Alzo Biosciences Inc., a testament to my commitment to translating research into practical solutions. I successfully secured the licensing of this groundbreaking technology from the Partnerships and Innovation department at the University of Manitoba, a strategic move aimed at obtaining the necessary funding for its further development and eventual clinical application.

METABOLIC RESEARCH:

1. **Mitochondrial Metabolism**: In recent years, my research has brought to light a groundbreaking signaling mechanism centered on the calcium/calmodulin-activated kinase (CAMKK2) and its role in regulating the mitochondrial succinate dehydrogenase (SDH) enzyme complex [13]. Notably, SDH represents the sole enzyme complex responsible for the regulation of both the Krebs cycle and the mitochondrial electron transport system. My work has firmly established the mechanistic foundation for the cell-type-specific control of SDHs by CAMKK2, a discovery that has profound implications for the pathogenesis of various diseases, including cancer, obesity, and diabetes. This revelation identifies CAMKK2 as a promising therapeutic target for addressing metabolic diseases.

2. **Hormonal Regulation of Cellular Metabolism**: My independent research endeavors have illuminated the intricate regulatory mechanisms orchestrated by progesterone and the progesterone receptor membrane component 1 (PGRMC1) in the context of glucose metabolism [14-15]. My commitment to advancing our understanding of metabolic diseases extends to the exploration of novel lipoxygenase gene regulation mechanisms [16].

3. **Long Noncoding RNA-Mediated Regulation of Lipid Metabolism**: Another significant milestone in my research journey led to the identification of a pioneering long non-coding antisense RNA (LncRNA) responsible for the regulation of the arachidonate 12-lipoxygenase (ALOX12) gene on the sense strand through transcriptional interference [17]. The ALOX12 gene encodes an enzyme crucial for acting on polyunsaturated fatty acid substrates, generating bioactive lipid mediators that play pivotal roles in regulating a wide array of biological processes associated with various disease pathologies. The revelation of ALOX12 regulation by antisense LncRNA is entirely novel and of immense importance, as it has opened up a new frontier in research involving LncRNA-mediated lipid metabolism. This groundbreaking finding was recently published in the esteemed journal Biochim Biophys Acta Mol Cell Biol Lipids [16], and we have taken steps to protect this innovation through a filed patent.

References:

1. **Sabbir, M G** et al. (2006). Diagnostic Molecular Pathology (PMID: 16531763)
2. **Sabbir, M G** et al. (2006). Int J Exp Pathol (PMID: 16623759)
3. **Sabbir, M G** et al. (2010) BMC Biology (PMID: 20199662)
4. **Sabbir, M G** et al. (2012). PLoS One (PMID: 22792269)
5. **Sabbir, MG** et al. (2016). Biology Open (PMID: 26977077)
6. Calcutt NA, Smith DR, Frizzi K, **Sabbir MG** et al. (2017) Journal of Clinical Investigation (PMID: 28094765)
7. **Sabbir, M G** et al. (2018) Frontiers in Neuroscience (PMID: 29997469)
8. **Sabbir, MG** (2018) Neuropharmacology (PMID: 30248305)
9. **Sabbir, MG et al.** (2022) Journal of Alzheimers Disease (PMID: 36155524)

10. **Sabbir, MG** (2018). Frontiers in Molecular Biosciences (PMID: 30525042)
11 **Sabbir, MG** (2020). Cell Communication and Signaling (PMID: 32460794)
12 **Sabbir, MG** (2020). BBA Mol Cell Res (PMID: 32485269)
13. **Sabbir MG** et al. (2021) Cell Communication and Signaling (PMID: 34563205)
14. **Sabbir MG** (2019) Steroid Biochem Mol Biol (PMID: 31067491)
15. **Sabbir MG** et al. (2021) Steroid Biochem Mol Biol (PMID: 34506922)
16. **Sabbir MG** et al. (2022) Cells (PMID: 36010555)
17. **Sabbir MG** (2021). BBB Mol Cell Biology of Lipids (PMID: 34174394)

E. PUBLICATIONS.

PUBLISHED FIRST-AUTHOR RESEARCH ARTICLES:
(CORRESPONDING AUTHOR: UNDERLINED)

1. **Sabbir MG. (2023),** Robison LS, and Boyd AJ, B **(2023).** Physiologically activated platelets secrete flavoprotein subunit A of mitochondrial succinate dehydrogenase enzyme complex: Implications in atherosclerosis**.** Front Cell Dev Biol. 2023 (In revision, 2 reviweres endorsed for publication, 3rd reviewer review report expected in June 21, 2023)
2. **Sabbir MG. (2023),** Swanson M, and Albensi, B **(2023).** Loss of Cholinergic Receptor Muscarinic 1 impairs cortical mitochondrial structure and function: Implications in Alzheimer's disease. Front Cell Dev Biol. 2023 May 18;11:1158604.
3. **Sabbir MG. (2023),** Swanson M, Speth R, and Albensi, B **(2023).** Hippocampal versus cortical deletion of Cholinergic Receptor Muscarinic 1 in mice differentially affects post-translational modifications and supramolecular assembly of respiratory chain-associated proteins, mitochondrial ultrastructure, and respiration: Implications in Alzheimer's disease. Front Cell Dev Biol. 2023; 11: 1179252.
4. **Sabbir MG,** Speth R, and Albensi, B **(2022).** Loss of Cholinergic Receptor Muscarinic 1 (CHRM1) protein in the hippocampus and temporal cortex of a subset of individuals with Alzheimer's Disease, Parkinson's Disease, or Frontotemporal dementia: Implications for patient survival. J Alzheimers Dis. 2022;90(2):727-747
5. **Sabbir MG**, Taylor CG, Zahradka P. **(2022)**, Growth State-Dependent Expression of Arachidonate Lipoxygenases in the Human Endothelial Cell Line EA.hy926. **Cells** 2022, 11(16), 2478. **https://doi.org/10.3390/cells11162478**
6. **Sabbir MG**, Taylor CG, Zahradka P. **(2021)**, CAMKK2 regulates mitochondrial function by controlling succinate dehydrogenase expression, post-translational modification, megacomplex assembly, and activity in a cell-type-specific manner. Cell Commun Signal. 2021 Sep 25;19(1):98.
   Research square video abstract:
   https://vimeo.com/604892958
   https://www.youtube.com/watch?v=icsL5agnN14
7. **Sabbir MG**, Taylor CG, Zahradka P. **(2021)**, Loss of β-Arrestins or six Gα proteins in HEK293 cells caused Warburg effect and prevented progesterone-induced rapid proteasomal degradation of progesterone receptor membrane component 1. Steroid Biochemistry and Molecular Biology 2021 Sep 11; 214: 105995.
   Video abstract: https://www.youtube.com/watch?v=BnDD_W35YVk
8. **Sabbir MG**, Taylor CG, Zahradka P. **(2021)**, Antisense overlapping long non-coding RNA regulates coding arachidonate 12-lipoxygenase gene by translational interference, Biochim Biophys Acta Mol Cell Biol Lipids, 2021 Jun 23;158987.
   Video abstract: https://www.youtube.com/watch?v=PhfSpnENLEs

9. **Sabbir MG (2020),** CAMKK2-CAMK4 signaling regulates transferrin trafficking, turnover, and iron homeostasis. Cell Communication & Signaling, 2020 May 27;18(1):80.
   Video abstract: https://www.youtube.com/watch?v=ttv8CGIRpME
10. **Sabbir MG**, Taylor CG, Zahradka P. **(2020)**, Hypomorphic CAMKK2 in EA.hy926 endothelial cells causes abnormal transferrin trafficking, iron homeostasis, and glucose metabolism, Biochim Biophys Acta Mol Cell Research, 2020 Oct;1867(10):118763.
    Video abstract: https://www.youtube.com/watch?v=kzmxu7uwJss
11. **Sabbir MG (2019).** Progesterone-induced Warburg effect in HEK293 cells is associated with post-translational modifications and proteasomal degradation of progesterone receptor membrane component 1**.** J Steroid Biochem Mol Biol, 2019. **191**: p. 105376.
12. **Sabbir MG (2018).** Loss of Ca2+/Calmodulin Dependent Protein Kinase Kinase 2 leads to aberrant transferrin phosphorylation and trafficking: a potential biomarker for Alzheimer's disease. Front in Molecular Bioscience: 5:1-28.
    Video abstract: https://www.youtube.com/watch?v=ao3IV8p0u6A&t=16s
13. **Sabbir MG**, & Fernyhough P **(2018b).** Muscarinic receptor antagonists activate ERK-CREB signaling to augment neurite outgrowth of adult sensory neurons. Neuropharmacology 143**:** 268-281.
14. **Sabbir MG**, Nigel C, & Fernyhough P **(2018).** Muscarinic acetylcholine type 1 receptor activity constraints neurite outgrowth by inhibiting microtubule polymerization and mitochondrial trafficking in adult sensory neurons. Frontiers in Neuroscience 12:2-19.
15. **Sabbir MG**, Dillon R, & Mowat MR **(2016).** Dlc1 interaction with non-muscle myosin heavy chain II-A (Myh9) and Rac1 activation. Biol Open 5: 452-460
16. **Sabbir MG**, Prieditis H, Ravinsky E, & Mowat MR **(2012).** The role of Dlc1 isoform 2 in K-Ras2(G12D) induced thymic cancer. PLoS One 7: e40302.
17. **Sabbir MG**, Wigle N, Loewen S, Gu Y, Buse C, Hicks GG, et al. **(2010).** Identification and characterization of Dlc1 isoforms in the mouse and study of the biological function of a single gene-trapped isoform. BMC Biol 8: 17.
18. **Sabbir MG**, Roy A, Mandal S, Dam A, Roychoudhury S, & Panda CK **(2006).** Deletion mapping of chromosome 13q in head and neck squamous cell carcinoma in Indian patients: correlation with prognosis of the tumor. Int J Exp Pathol 87: 151-161.
19. ***Sabbir MG***, Dasgupta S, Roy A, Bhoumik A, Dam A, Roychoudhury S, et al. **(2006).** Genetic alterations (amplification and rearrangement) of D-type cyclins loci in head and neck squamous cell carcinoma of Indian patients: prognostic significance and clinical implications. Diagn Mol Pathol 15: 7-16.

PUBLISHED CO-AUTHORED RESEARCH ARTICLES:

1. Saleh A, **Sabbir MG**, et al. (**2020**) Muscarinic Toxin 7 Signals Via Ca(2+)/Calmodulin-Dependent Protein Kinase Kinase beta to Augment Mitochondrial Function and Prevent Neurodegeneration. Mol Neurobiol 57:2521-2538.
2. Abu-El-Rub E, Sequiera GL, Sareen N, Yan W, Moudgil M, **Sabbir MG**, and Dhingra S. Hypoxia-induced 26S proteasome dysfunction increases immunogenicity of mesenchymal stem cells. Cell Death Dis. **2019**; 10(2):90
3. Schartner E, **Sabbir MG**, et al. **(2018).** High glucose concentration suppresses a SIRT2-regulated pathway that enhances neurite outgrowth in cultured adult sensory neurons. Exp Neurol 309: 134-147.
4. Calcutt NA, Smith DR, Frizzi K, **Sabbir MG**, , et al. **(2017).** Selective antagonism of muscarinic receptors is neuroprotective in peripheral neuropathy. J Clin Invest 127: 608-622.

5. Aghanoori MR, Smith DR, Roy Chowdhury S, **Sabbir MG** et al. **(2017).** Insulin prevents aberrant mitochondrial phenotype in sensory neurons of type 1 diabetic rats. Exp Neurol 297: 148-157.
6. Cadonic C, **Sabbir MG**, & Albensi BC **(2016).** Mechanisms of Mitochondrial Dysfunction in Alzheimer's Disease. Mol Neurobiol 53: 6078-6090.
7. Djordjevic J, **Sabbir MG**, & Albensi BC **(2016).** Traumatic Brain Injury as a Risk Factor for Alzheimer's Disease: Is Inflammatory Signaling a Key Player? Curr Alzheimer Res 13: 730-738.
8. Adlimoghaddam A, **Sabbir MG**, & Albensi BC **(2016).** Ammonia as a Potential Neurotoxic Factor in Alzheimer's Disease. Front Mol Neurosci 9: 57.
9. Ghosh A, Ghosh S, Maiti GP, **Sabbir MG**, Zabarovsky ER, Roy A, et al. **(2010).** Frequent alterations of the candidate genes hMLH1, ITGA9, and RBSP3 in early dysplastic lesions of head and neck: clinical and prognostic significance. Cancer Sci 101: 1511-1520.
10. Ghosh A, Ghosh S, Maiti GP, **Sabbir MG**, Alam N, Sikdar N, et al. **(2009).** SH3GL2 and CDKN2A/2B loci are independently altered in early dysplastic lesions of head and neck: correlation with HPV infection and tobacco habit. J Pathol 217: 408-419.
11. Bhattacharya N, **Sabbir MG,** Roy A, Dam A, Roychoudhury S, & Panda CK **(2005).** Approximately 580 Kb surrounding the MYC gene is amplified in head and neck squamous cell carcinoma of Indian patients. Pathol Res Pract 201: 691-697.
12. Chakraborty SB, **Sabbir MG**, Roy A, Sengupta A, & Panda CK **(2003).** Multiple Deletions in Chromosome 3p are Associated with the Development of Head and Neck Squamous Cell Carcinoma. International Journal of Human Genetics 3: 79-87.
13. Bhattacharya N, Tripathi A, Dasgupta S, **Sabbir MG**, Roy A, Sengupta A, et al. **(2003).** Association of deletion in the chromosomal 8p21.3-23 region with the development of invasive head & neck squamous cell carcinoma in Indian patients. Indian J Med Res 118: 77-85.

F. ADDITIONAL INFORMATION: RESEARCH SUPPORT AND/OR SCHOLASTIC PERFORMANCE

PATENT:

1. **WO2020069621** - NOVEL BIOMARKER FOR ALZHEIMER'S DISEASE IN HUMANS.
   Status of the patent: The PCT application was filed with CIPO on Oct 28, 2019 (Serial number: PCT/CA2019/051417). I established a company named Alzo Bioscience Inc. and licensed the technology from the University of Manitoba to develop the Biomarker for clinical diagnostics. Currently, generating funds to file for international patents.
2. **US Provisional Patent Application No.: 63/209,072**; A method to regulate alox12-as1 lncRNA-mediated alteration of alox12 protein and to screen for novel drugs to alter alox12 protein level.
   Status: US patent filed.

DISCLOSURES
PARTNERSHIPS AND INNOVATION (P&I), UNIVERSITY OF MANITOBA

1. Entitled "Therapeutic strategy to selectively manipulate mitochondrial function in cancer and neurodegenerative disorders". P&I file number: 2018-033.

2. Entitled "Disruption of ALOX12 protein expression with antisense oligonucleotides targeting ALOX12-AS1 lncRNA." P&I file number: 2020-0138.

RESEARCH GRANTS/FUNDING GENERATION:

1. Principal Investigator in President's Faculty Research and Development, Nova Sotheastern University in 2022, entitled: Restoring CAMKK2 protein levels to treat neurodegeneration in Alzheimer's disease.
   My contribution: As Principal Investigator, Independently Conceptualized designed, and wrote the grant.
   Status: Received, $15,000.
2. **Principal Investigator** in Health Professions Division (HPD) research grant**, 2022, Investigating the role of transglutaminase in the pathological appearance of MAPT aggregates in Alzheimer's disease using human brain tissues post-mortem". Submitted May 2022.**
   My contribution: As Principal Investigator, Independently Conceptualized designed, and wrote the grant.
   Status: **Awarded $7500 for one year**.

G. FELLOWSHIPS AND AWARDS:

1. Qualified in NET-LS-1998 (National Eligibility Test for Lectureship) conducted by Council of Scientific & Industrial Research (CSIR), Govt. of India.
2. Awarded Canadian Institute of Health Research/Innovative Technologies in Multidisciplinary Health Research Training (CHIR/ITMHRT) Fellowship for Postdoctoral research in 2007.
3. Awarded Manitoba Health Research Council (MHRC) Postdoctoral research fellowship in July 2009
4. Received Hester award (CancerCare, MB) for best poster presentation at the 11th CancerCare Manitoba Research Day, University of Manitoba, April 2009.
5. Received Dean of Medicine Poster Awards in June 2009 for poster presentation in the Manitoba student research poster competition, University of Manitoba

H: INVITED LECTURES/SPEAKER:

1. **January 13-14th 2021**: Invited speaker and panelist in the Fifth International Symposium on Sigma-2 Receptors - Panel 2: Oncology and Disorders of the Periphery. Title of presentation "Perspective on PGRMC1-mediated metabolic regulation".
   https://cogrx.com/news/events/fifth-iss2r-agenda/'
   https://www.youtube.com/watch?v=RmEIH4SL7dY
2. **May 25th, 2020:** Dementia Journal Club - Invited lecture entitled "CAMKK2-CAMK4 signaling regulates transferrin trafficking, turnover, and iron homeostasis". Manitoba Neuroscience Network.
   Pre-recorded Lecture: https://www.youtube.com/watch?v=PYUC9O9anvI&t=8s
3. **August 23rd, 2018**: Invited lecture in DREAM (Diabetes Research Envisioned and Accomplished in Manitoba) Journal club, University of Manitoba, Canada. Title: "Novel role of muscarinic acetylcholine receptors in regulating mitochondrial ultrastructure and function".

4. **June 18th, 2018**: Invited lecture in the Regenerative Medicine Programme, Department of Physiology, University of Manitoba, Canada. Title: "Novel insight into the progesterone-binding protein signaling by implementing CRISPR/Cas9".
5. **April 25th, 2018**: Invited lecture for an industry coloration with Neuroendocrine Biosciences Inc., San Diego, USA. Title: "Muscarinic acetylcholine receptor M1: Allosteric modulation for therapeutic benefits".
6. **April 23rd, 2018:** Invited lecture in the Department of Pathology, UC San Diego School of Medicine, USA. Title: "Muscarinic acetylcholine receptor M1: Allosteric modulation for therapeutic benefits
7. **March 7th, 2018,** Invited lecture in Institute of Cardiovascular Science (ICS) seminars and visiting scientist program, St. Boniface Hospital Albrechtsen Research Centre, Canada. Title: "Muscarinic acetylcholine receptor M1: Allosteric modulation for therapeutic benefits".
8. **April 22nd, 2016**: Invited lecture in Pharmacology Seminar Series, Department of Pharmacology & Therapeutics, University of Manitoba, Canada. Title: "Novel insight into muscarinic acetylcholine type-1 receptor-mediated cytoskeletal alteration in sensory neurons."
9.

I. <u>INVITED THESIS EXAMINATION</u>:

1. Invited by the Director of Research, Charles Sturt University, Australia, for evaluation of the thesis entitled "The Role of Progesterone Receptor Membrane Component 1 (PGRMC1) in Cell Biology". **<u>Examiner recommendation letter</u>** from the Director, Graduate Research, Charles Sturt
2. Invited by the Director of Research, Charles Sturt University, Australia, for evaluation of the thesis entitled "The role of PGRMC1 in cell biology and pancreatic cancer tumorigenesis and a novel mechanism for fibril formation".

J: <u>CONFERENCE PARTICIPATION AND/OR PUBLICATIONS:</u>

1. **<u>Sabbir MG</u>,** Swanson M, and Albensi, B (2022). Sunposium March 6-8, 2023 - Max Planck Florida Institute for Neuroscience. Abstract Title**:** Loss of Cholinergic Receptor Muscarinic 1 disrupts mouse cortical mitochondrial structure and function by affecting the supramolecular assembly of oxidative phosphorylation-associated proteins: Implications in Alzheimer's disease.
2. **<u>Sabbir MG</u>,** Morlund P, Speth B, and Albensi, B (2022). Sunposium March 6-8, 2023 - Max Planck Florida Institute for Neuroscience. Abstract Title**:** Cholinergic Receptor Muscarinic 1 (Chrm1) colocalized with mitochondria in cultured dorsal root ganglion neurons and deletion of Chrm1 disrupted mitochondrial ultrastructure in mouse peripheral neurons: Implications in Alzheimer's disease.
3. **<u>Sabbir MG</u>,** Speth R, and Albensi, B (2022). The 1st American Exosomes and RNA Conference; won poster competition 3rd rank, Abstract Title**:** Arachidonate 12-Lipoxygenase antisense lncRNA in activated platelet-derived exosomes: Potential role in regulating lipoxygenase-mediated inflammation
4. **<u>Sabbir MG</u>,** Taylor CG & Zahradka P. Experimental Biology 2021, Abstract Title**:** An overlapping lncRNA antisense to coding arachidonate 12-lipoxygenase gene is ubiquitously expressed and exhibited cell-type-specific subcellular localization. Poster accepted. To be held on **April 27-30, 2021**, virtual.

5. **Sabbir MG.** 13th Annual Drug Discovery for Neurodegeneration Conference, Long Beach, California, Date: **2019/03, Participated.**
6. **Sabbir MG.** 19th International Conference on Alzheimer's Drug Discovery, Jersey City, New Jersey, Date: **2018/9, Participated**.
7. **Sabbir MG**, Calcutt NA, Fernyhough P. Muscarinic Receptor Antagonism Rescues Cholinergic-mediated Cytoskeletal Defects and Enhances Neurite Outgrowth in Sensory Neurons. Peripheral Nerve Society, Annual Meeting, Baltimore, United States, Conference Date: **2018/7, Poster.**
8. **Sabbir MG**, Calcutt NA, and Fernyhough P. Muscarinic Acetylcholine Type 1 Receptor Constrain Neurite Outgrowth by Inhibiting Microtubule Polymerization and Mitochondrial Trafficking in Adult Sensory Neurons: A Phenotype Rescued by Antagonist Treatment. American Society for Biochemistry and Molecular Biology, Annual Meeting, San Diego, United States, Conference Date: **2018/4, Poster**
9. **Sabbir MG** and Fernyhough P. Muscarinic Antagonist Mediated Activation of ERK Signaling Depends on & β-arrestin Recruitment to Augment Axonal Outgrowth in Neurons. American Society for Biochemistry and Molecular Biology Annual Meeting, San Diego, United States, Conference Date: **2018/4**
10. **Sabbir MG** and Fernyhough P. Ca2+/Calmodulin-Dependent Protein Kinase Kinase 2 Negatively Regulates Progesterone Mediated PGRMC1 Signaling and the Warburg Effect. American Society for Biochemistry and Molecular Biology Annual Meeting, San Diego, United States, Conference Date: **2018/4, Poster.**
11. **Sabbir MG** and Fernyhough P. Selective muscarinic receptor antagonism activates the ERK/MAPK pathway in adult sensory neurons. Peripheral Nerve Society Annual Meeting, Sitges-Barcelona, Spain, Conference **Date: 2017/7, Poster**
12. **Sabbir MG**, Calcutt NA, and Fernyhough P. Muscarinic receptor signaling constrain axonal outgrowth by augmenting the dissolution of the cytoskeleton in adult sensory neurons. Peripheral Nerve Society Annual Meeting, Sitges-Barcelona, Spain, Conference Date**: 2017/7, Poster.**
13. **Sabbir MG** and Fernyhough P. Muscarinic acetylcholine type 1 receptor regulates mitochondrial trafficking through altered cytoskeleton in adult sensory neurons. Keystone G Protein-Coupled Receptors: Structure, Signaling and Drug Discovery, Keystone, United States, Conference Date: **2016/12, Poster.**
14. **Sabbir MG** and Fernyhough P. Muscarinic acetylcholine receptor type-1 antagonists modulate posttranslational modifications of Ca2+/calmodulin-dependent protein kinase kinase β in adult dorsal root ganglion neurons. Society for Neuroscience Annual Meeting, San Diego, United States, Conference Date: **2016/11, Poster**.
15. **Sabbir MG** and Fernyhough P. Over-expression of muscarinic acetylcholine type 1 receptor causes cytoskeletal abnormalities and impairs mitochondrial trafficking in adult sensory neurons. Society for Neuroscience Annual Meeting, San Diego, Conference Date: **2016/11, Poster.**
16. **Sabbir MG** and Fernyhough P. Muscarinic acetylcholine receptor type-1 antagonists modulate posttranslational modifications of Ca2+/calmodulin-dependent protein kinase kinase b in adult dorsal root ganglion neurons. 10th Annual Canadian Neuroscience Meeting, Toronto, Canada, Conference Date: **2016/5, Poster.**
17. **Sabbir MG** and Fernyhough P. Effect of pirenzepine and muscarinic toxin-7 on muscarinic acetylcholine type-1receptor internalization and downstream signaling cascades. 10th Annual Canadian Neuroscience Meeting, Toronto, Canada, Conference Date: **2016/5, Poster**

K. <u>PROFESSIONAL SERVICE</u>:

1. **Guest Editor**: Frontier's's in Cell and Developmemt.
2. Reviewer: Neuroscience letters.
3. Reviewer: Journal of Steroid Biochemistry and Molecular Biology
4. Reviewer: Frontiers in Neuroscience
5. Editorial Board Member for the American Journal of Psychiatry and Neuroscience.

L. <u>OUTREACH ACTIVITY</u>:

1. 2013-2022: Judge at the Manitoba Schools Science Symposium (MSSS).
2. 2012-2016: Volunteer, at Winnipeg Fringe Theatre Festival
3. Volunteered for fundraising for St. Boniface Albrechtsen Research Centre.
4. Volunteered in research at St. Boniface Albrechtsen Research Centre.