Md. Mahiuddin Ahmed, Ph.D.
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Present Position

Assistant Professor-Research
Department of Neurology
University of Colorado Alzheimer's and Cognition Center
Linda Crnic Institute for Down Syndrome
University of Colorado Denver Anschutz Medical Campus
Aurora, CO-80045, USA

EDUCATION

Ph.D. in Neurobiology **2004**
Graduate School of Integrated Science
Yokohama City University, Japan

Dissertation title: "Effects of NMDA receptor antagonists on the levels of glial cells, neuropeptides, and peptide-metabolizing enzymes in rat brain regions of dementia and epilepsy models"

Supervisor: **Takeshi Kato, Ph.D.**
Professor
Laboratory of Natural Information Science
Graduate School of Integrated Science
Yokohama City University
22-2 Seto, Kanazawa-Ku
Yokohama 236-0027, Japan

Master of Science in Biochemistry and Molecular Biology **1995**
Department of Biochemistry and Molecular Biology
University of Dhaka, Bangladesh

Dissertation title: "Studies on neurotransmitter mediating enzyme Dopamine-β hydroxylase (DBH), its cofactors and other biochemical parameters in the serum of the patients with arsenicosis"

Supervisor: **Md. Khalilur Rahman, Ph.D.**
Professor
Department of Biochemistry and Molecular Biology
University of Dhaka, Bangladesh

Bachelor of Science in Biochemistry and Molecular Biology **1994**
Department of Biochemistry and Molecular Biology
University of Dhaka, Bangladesh

RESEARCH EXPERIENCE

1) Assistant Professor-Research **August 2022-Present**
Department of Neurology, University of Colorado Alzheimer's and Cognition Center & Linda Crnic Institute for Down Syndrome, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

- **i)** To evaluate the potential efficacy of GM-CSF on amyloidopathy, tauopathy, astrogliosis and neuroinflammation in TgF344-AD rat model of Alzheimer's disease.
- **ii)** To investigate the brain pathology in Covid-19 mice treated with GM-CSF.
- **iii)** To investigate the purkinje cells abnormalities in the cerebellum of different mice models of Autism.
- **iv)** To investigate the glial and neuronal cells pathology in the postmortem brains in the individual with Down syndrome, and compare with the postmortem brain in the age-matched typical individual.

Collaborative works:

- To determine how Traumatic Brain Injury (TBI) induces Alzheimer's retinopathy in the retina of TgF344-AD rats. (with Dr. Vergara)
- To determine the effects of acute co-treatment of CtBP inhibitor, NSC95397 and GM-CSF on AD pathology and peripheral biomarkers in TgF344-AD rats after 2X-CCI. (With Dr.Huang).

Mentorship:

I served as a Mentor for Sarah Kawell, a MS student from the Graduate program of Biomedical Sciences and Biotechnology, Graduate School, University of Colorado Anschutz Medical Campus, May 2022-August 2022. Sarah has successfully completed her thesis work entitled "Cerebellar Cellular Abnormalities in Alzheimer's Disease with Treatment by Granulocyte-Macrophage Colony-Stimulating Factor (GM-CSF)".

General/Supervision

- Supervision professional research assistants
- Teaching/training students and new personnel in standard laboratory procedures, immunohistochemistry protocols, research projects and troubleshooting
- Writing Manuscripts and grant
- Attending several conferences in a year
- Presenting research works in internal and external scientific forum.

2) Senior Research Instructor **May 2021-July 2022**
Department of Neurology, University of Colorado Alzheimer's and Cognition Center & Linda Crnic Institute for Down Syndrome, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

v) To evaluate the potential efficacy of GM-CSF on amyloidopathy, tauopathy, astrogliosis and neuroinflammation in TgF344-AD rat model of Alzheimer's disease.

vi) To investigate the brain pathology in Covid-19 mice treated with GM-CSF.

vii) To investigate the purkinje cells abnormalities in the cerebellum of different mice models of Autism.

viii) To investigate the glial and neuronal cells pathology in the postmortem brains in the individual with Down Syndrome, and compare with the postmortem brain in the age-matched typical individual.

Collaborative works:

- To determine how Traumatic Brain Injury (TBI) induces Alzheimer's retinopathy in the retina of TgF344-AD rats. (with Dr. Vergara)
- To determine the effects of acute co-treatment of CtBP inhibitor, NSC95397 and GM-CSF on AD pathology and peripheral biomarkers in TgF344-AD rats after 2X-CCI. (With Dr. Huang).

General/Supervision

- Supervision professional research assistants
- Teaching/training students and new personnel in standard laboratory procedures, immunohistochemistry protocols, research projects and troubleshooting
- Writing Manuscripts and grant
- Attending several conferences in a year
- Presenting research works in internal and external scientific forum.

3) Research Instructor **August 2019-April 2021**

University of Colorado Alzheimer's and Cognition Center & Linda Crnic Institute for Down Syndrome, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

i) Pre-clinical study in a mouse model of Down syndrome and a rat model of Alzheimer's disease

- To evaluate the potential efficacy of GM-CSF for intellectual disability in DS, investigating the performance of several behavioral assays before and after treatment with GM-CSF in both male and female of Dp16 mice.
- To investigate potential neuronal and molecular mechanisms related to learning and memory deficits in the Dp16 mice, using immunohistochemical approaches to study brain neuropathology in the Dp16 and littermate control mice after treatment with GM-CSF.
- To determine the effects of GM-CSF on amyloidopathy, tauopathy, and neuroinflammation in TgF344-AD rat model of Alzheimer's disease.

ii) General/Supervision

- Supervision professional research assistants
- Teaching/training new personnel in standard laboratory procedures, immunohistochemistry protocols, research projects and troubleshooting
- Contributed to preparation of manuscripts and grants.

4) Research Associate **Jan 2017-July 2019**

University of Colorado Alzheimer's and Cognition Center & Linda Crnic Institute for Down Syndrome, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

i) Pre-clinical study in a mouse model of Down syndrome

- Effects of Granulocyte-macrophage colony stimulating factor (GM-CSF) treatment on learning, memory and neuropathology in a mouse model of Down syndrome (DS)
- To evaluate the potential efficacy of GM-CSF for intellectual disability in DS, investigating the performance of several behavioral assays before and after treatment with GM-CSF in both male and female of Dp16 mice.
- To investigate potential neuronal and molecular mechanisms related to learning and memory deficits in the Dp16 mice, using immunohistochemical approaches to study brain neuropathology in the Dp16 and littermate control mice after treatment with GM-CSF.
- To investigate the expression levels and patterns of key marker proteins in neurons, synapse, glia, and interneurons in brain of Dp16 mice and wild-type littermate control mice treated with GM-CSF.

iii) Mentorship/supervision

- Worked as Mentor for a MS student from the Graduate program of Biomedical Sciences and Biotechnology, Graduate School, University of Colorado Denver.
- Teaching/training and supervision of several summer students.
- Contributed to preparation of manuscripts and grants.
- Contributed to preparation of patent application.

5) Research Associate **July 2011-Dec 2016**

Department of Pediatrics, Linda Crnic Institute for Down Syndrome, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

i) Down syndrome

- Using the high throughput proteomics technique of Reverse Phase Protein Arrays, identified abnormalities in MAPK, MTOR and other signaling pathways in brain regions of mouse models of Down syndrome.
- Characterized dynamic responses in protein levels and subcellular localization in brain regions of wild type mice after normal learning in context fear conditioning and in a mouse models of Down syndrome after failed learning.
- Characterized the effects of the NMDA receptor antagonist, memantine, on protein profiles in normal learning and in rescued learning in a Down syndrome models.
- Identified protein responses to an NMDA receptor antagonist, a GABAA receptor antagonist and an MTOR antagonist, in in vitro brain slice cultures of wild type and Down syndrome mice.

ii) Signaling pathways in epilepsy

- Generated protein profiles in human epilepsy resected brain samples, and compared them to profiles obtained in two mouse models of epilepsy, pilocarpine treatment and a PTEN knockout.

iii) General

- Teaching/training new personnel in standard laboratory procedures, proteomics protocols, research projects and troubleshooting.
- Supervision of graduate rotation student and undergraduate interns and summer students
- Contributed to preparation of manuscripts.

6) **Post-Doctoral Fellow** **Sept 2008-July 2011**
Department of Pediatrics, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

- Implemented the high throughput technique of Reserve Phase Protein Arrays and developed protocols for application to mouse brain samples.
- Implemented the technique heat stabilization for preserving post-translational modifications in protein lysate preparation from tissue samples and demonstrated the differential stability of specific protein phosphorylation.
- Applied heat stabilization and reverse phase protein arrays to demonstrate differential perturbation of signaling pathways in brain regions of two mouse models of Down syndrome.
- Identified novel abnormalities and loss of correlations among functionally related proteins in brain regions of Down syndrome mouse models.
- Contributed to preparation of manuscripts.

7) **Research Scientist** **Sept 2004-July 2008**
Laboratory of Research and Development, Bioelectro Analytical Science (BAS) Inc. Tokyo, Japan

- Implemented the Surface Plasmon Resonance (SPR) technique for detecting antigen-antibody and protein-protein interactions.
- Detected enterotoxins in milk using SPR technology collaborating with NTT Microsystem Integration Laboratories, Japan
- Investigated in vivo monitoring of neurotransmitters in rat brain regions using microdialysis
- Measured the levels of neurotransmitters using HPLC.

8) **PhD Research work** **Oct 1999- March 2004**
Graduate School of Integrated Science, Yokohama City University, Yokohama, Japan

- Characterized the effect of NMDA receptor antagonists -MK-801 and memantine, on the levels of neuropeptides, peptidases and activated glial cells in brain regions of rat models of Alzheimer's disease and epilepsy.

- Investigated the recovery effects of MK-801 in a pentylenetetrazol (PTZ)-induced rat model of seizures.
- Investigated the neuron-glial relationship in the brains of Alzheimer's disease and rat seizure models.
- Experienced working in several HPLC techniques for detecting neurotransmitters and measuring enzymes in rat brain lysates.
- Supervised masters and undergraduate students
- Teaching/training a PhD student.
- Prepared manuscripts, PhD dissertation, fellowship proposals, and published several articles as a first author in the international journals.

TECHNICAL EXPERTISE

- **Basic molecular biology techniques:** DNA and RNA extraction form rat and mouse brain tissues, PCR, qPCR, Northern blot analysis and DNA sequencing
- **Protein analysis techniques:** Reverse Phase Protein Array (RPPA), Immunohistochemistry/Immunofluorescence, SDS-PAGE and Western blot analysis, ELISA
- **Protein/Enzyme purification techniques:** Gel filtration, column chromatography affinity column chromatography
- **HPLC technique:** Measurement of levels of peptidyl arginine deiminase (PAD), choline, acetyl choline, dopamine, serotonin, norepinephrine from rat brain regions
- **Enzyme assays:** Measurement of levels of activity of endopeptidase EC 24.15, prolyl endopeptidase, β-D-glucuronidase and aminopeptidase B (APB) in rat brain regions
- Surface Plasmon Resonance (SPR) for antigen- antibody and protein-protein interactions
- **Rodent handling:** Proper mouse and rat care, handling and euthanasia
    - **Rat procedures:** dissection of brain tissues, stereotaxic brain surgery, intraperitoneal injection (i.p.) injection of drug, microinjection and microdialysis of rat brain regions, brain lesion experiments
    - **Mouse procedures:** dissection of brains and peripheral tissues; in vitro brain slice culture
- **Mouse/Rat behavioral studies:** Open field, Y-maze, Radial Arm Water Maze, Morris Water Maze, Elevated Zero Maze, Novel Object/Novel Place Recognition, Contextual Fear Conditioning
- **Golgi staining** for morphology of dendrites and dendritic spines in mouse and rat brains
- **Tissue culture:** maintenance of lymphoblastoid cell lines
- **Immunofluorescence and Microscopy:** light and fluorescence microscopy for immunohistochemical and immunofluorescence imaging
- **Computer Software:** MS Office; statistical tools in GraphPad Prism, SAS and R; Adobe Photoshop, RPPAware

- **Data Analysis:** Management and analysis of large datasets from reverse phase protein array experiments using Xcel, RPPAware, and statistical tools

PUBLICATIONS (*, co-first authors)

1. Esteban M. Lucero, Ronald K. Freund, Alexandra Smith, Noah R. Johnson, Breanna Dooling, Emily Sullivan, Olga Prikhodko, **Md. Mahiuddin Ahmed**, David A. Bennett, Timothy J. Hohman, Mark L. Dell'Acqua, Heidi J. Chial, Huntington Potter. "Increased expression of KIF11/kinesin5 offsets Alzheimer Aβ-mediated toxicity and cognitive dysfunction in cell culture, mice, and humans." *iScience;* in press. https://www.sciencedirect.com/science/article/pii/S2589004222015607
2. **Ahmed MM**, Wang AC, Elos M, Chial HJ, Sillau S, Solano DA, Coughlan C, Aghili L, Anton P, Markham N, Adame V, Gardiner KJ, Boyd TD, Potter H. "The innate immune system stimulating cytokine GM-CSF improves learning/memory and interneuron and astrocyte brain pathology in Dp16 Down syndrome mice and improves learning/memory in wild-type mice." *Neurobiol Dis.* 2022 Jun 15;168:105694. doi: 10.1016/j.nbd.2022.105694. Epub 2022 Mar 18. PMID: 35307513.
3. **Ahmed MM***, Johnson NR*, Boyd TD, Coughlan C, Chial HJ, Potter H*. "Innate Immune System Activation and Neuroinflammation in Down Syndrome and Neurodegeneration: Therapeutic Targets or Partners?" *Front Aging Neurosci*. 2021 Sep 16;13:718426. doi: 10.3389/fnagi.2021.718426. PMID: 34603007; PMCID: PMC8481947.
4. **Ahmed MM***, Block A*, Busquet N*, Gardiner KJ. Context Fear Conditioning in Down Syndrome Mouse Models: Effects of Trisomic Gene Content, Age, Sex and Genetic Background. *Genes (Basel)*. 2021 Sep 28;12(10):1528. doi: 10.3390/genes12101528. PMID: 34680922; PMCID: PMC8535510.
5. **Ahmed MM**, Carrel AJ, Cruz Del Angel Y, Carlsen J, Thomas AX, González MI, Gardiner KJ, Brooks-Kayal A. Altered Protein Profiles During Epileptogenesis in the Pilocarpine Mouse Model of Temporal Lobe Epilepsy. *Front Neurol.* 2021 May 28;12:654606. doi: 10.3389/fneur.2021.654606. PMID: 34122302; PMCID: PMC8194494.
6. Block A, **Ahmed MM**, Rueda N, Hernandez MC, Martinez-Cué C, Gardiner KJ: "The $GABA_A\alpha5$-selective Modulator, RO4938581, Rescues Protein Anomalies in the Ts65Dn Mouse Model of Down Syndrome" *Neuroscience*. 2018 Feb 21;372:192-212.
7. **Ahmed MM**, Block A, Tong S, Davisson MT, Gardiner KJ: "Age exacerbates abnormal protein expression in a mouse model of Down syndrome" *Neurobiol Aging.* 2017 Sep; 57:120-132.
8. Block A, **Ahmed MM**, Dhanasekaran AR, Tong S, Gardiner KJ: "Sex differences in protein expression in the mouse brain and their perturbations in a model of Down syndrome" *Biol Sex Differ.* 2015 Nov 9;6:24.
9. **Ahmed MM,** Dhanasekaran AR, Block A, Tong S, Costa ACS, Stasko M, Gardiner KJ: "Protein Dynamics Associated with Failed and Rescued Learning in the Ts65Dn Mouse Model of Down syndrome" PLos One 2015 10(3): e0119491.doi:10.1371/ journal.pone.0119491.
10. **Ahmed MM,** Dhanasekaran AR, Block A, Tong S, Costa ACS, Gardiner KJ: "Protein profiles associated with context fear conditioning and their modulation by memantine" *Mol*

Cell Proteomics 2014 13: 919-937.

11. Block A, Dhanasekaran AR, **Ahmed MM,** Gardiner KJ: "Abnormal protein profiles in hippocampus of mouse models of Down syndrome: similarities with Alzheimer's Disease" *J Alzheimers Dis Parkinsonism 2014, 4: 138.*
12. **Ahmed MM,** Dhanasekaran AR, Tong S, Wiseman FK, Fisher EMC, Tybulewicz VLJ, Gardiner KJ: "Protein profiles in Tc1 mice implicate novel pathway perturbations in the Down syndrome brain" *Hum Mol Genet.* 2013, 22, 1709-24.
13. Spellman C*, **Ahmed MM*,** Dubach D, Gardiner KJ: "Expression of trisomic proteins in Down syndrome model systems" *Gene* 2013, 512(2), 219-225.
14. **Ahmed MM,** Sturgeon X, Ellison M, Davisson MT, Gardiner KJ: "Loss of correlations among proteins in brains of the Ts65Dn mouse model of Down Syndrome" *J Proteome Res*. 2012, 11(2), 1251-1263.
15. Sturgeon X, Li T, **Ahmed MM**, Gardiner KJ: "Pathways to cognitive deficits in Down syndrome" *Prog in Brain Res*.2012, 197, 73-100.
16. **Ahmed MM,** Gardiner KJ: "Preserving protein profiles in tissue samples: differing outcomes with and without heat stabilization" *J Neurosci. Methods,* 2011,196, 99-106.
17. Arif M, Chimkuma T, **Ahmed MM,** Nakazato M, Smith MA and Kato T: "Effect of memantine on soluble Aβ 25-35 – induced changes in peptidergic and glial cells in Alzheimer's disease model rat brain regions' *Neuroscience,* 2009, 164, 1199-1209.
18. Arif M, Chikuma T, **Ahmed MM,** Yoshida S and Kato T: "Suppressive effect of clozapine but not haloperidol on the increases of neuropeptide-degrading enzymes and glial cells in (+) MK-801-treated rat brain regions" *Neuoscience Res.*2007, 57, 248-258.
19. Arif M, **Ahmed MM**, Kumabe Y, Hoshino H, Chikuma T, and Kato T: "Clozapine but not haloperidol suppresses the changes in the levels of neuropeptides in MK-801-treated rat brain regions" *Neurochem. Int*. 2006, 49, 304-311.
20. **Ahmed MM**, Arif M, Chikuma T and Kato T: "Pentylenetetrazol-induced seizures affect the levels of prolyl oligopeptidase, thimet oligopeptidase and glial proteins in rat brain regions, and attenuation by MK-801 pretreatment" *Neurochem. Int.* 2005, 47, 248-259.
21. Yamamoto K, Zeng H, Shen Y, **Ahmed MM** and Kato T: "Evaluation of an amperometric glucose biosensor based on a ruthenium complex mediator of low rodex potential" *Talanta* 2005, 66(5), 1175-1180.
22. **Ahmed MM**, Hoshino H, Chikuma T, Yamada M and Kato T: "Effect of memantine on the levels of glial cells, neuropeptides, and peptide-degrading enzymes in rat brain regions of ibotenic acid-treated Alzheimer's disease model" *Neuroscience,* 2004, 126, 639-649.
23. **Ahmed MM**, Yamamoto M, Chikuma T, Rahman MK, and Kato T: "Dose-dependent effect of MK-801 on the levels of neuropeptides processing enzymes in rat brain regions" *Neurosci.Res.* 2003, 47 (2), 177-189.
24. Yamamoto M, Chikuma T, Yamashita A, Yamaguchi M, Hojo H, Ozeki Y, **Ahmed MM**, and Kato T: "Anterograde axonal transport of endopeptidase 24.15 in rat sciatic nerves" *Neurochem. Int.* 2003*,* 42 (3), 231-237

CONFERENCE ATTENDED & PRESENTATIONS

ORAL PRESENTATION:

1. **Ahmed MM,** Wand ACJ, Boyd T, Elos M, Chial HJ, Gardiner KJ, and Potter H. **"**GM-CSF Reverses Memory Deficits in Normal Aged Mice and in the Dp(16)1Yey Mouse Model of Down Syndrome." Alzheimer's Association International Conference (AAIC), July 14-18, 2019, Los Angeles, CA, USA.
2. **Ahmed MM**, Wang ACJ, Boyd T, Elos M, Gardiner KJ, and Potter H: "**TREATMENT WITH GRANULOCYTE-MACROPHAGE COLONY-STIMULATING FACTOR IMPROVES COGNITION IN AGING MICE AND IN A MOUSE MODEL OF DOWN SYNDROME". 3rd International Conference, Trisomy 21 Research Society, Barcelona, Spain, 6-9 June, 2019**
3. **Ahmed MM,** Block A, Dhanasekaran AR, Gardiner KJ: "Perturbations in signaling pathways caused by trisomy of human chromosome 21". 3rd Reverse Phase Protein Array Global Workshop, Kobe University Integrated Research Center Convention Hall, Kobe, Japan. November 12-13, 2013 **(as an invited speaker)**
4. Block A, **Ahmed MM**, Dhanasekaran AR, Gardiner KJ: "Protein profiles in the Dp(10)1Yey and Dp(17)1Yey mice predict novel pathway perturbations in teh Down syndrome brain and sex-specific abnormalities in protein levels". Workshop on cognition in Down Sundrome Molecular, Cellular and Behavioral Features and the Promise of Pharmacotherapies, Wasington, DC, USA (April 13-15, 2013)
5. **Md. Mahiuddin Ahmed**, Takeshi Kato, Katsunobu Yamamoto: Electrochemical Surface Plasmon Resonance (EC-SPR): A novel technique for the simultaneous measurement of SPR and the electrochemical properties of molecules/chemicals. 69th Analytical Chemistry Discussion Congress, Nagoya, Japan (2008).

6. **Md. Mahiuddin Ahmed,** Toshiyukji Chikuma, Md. Khalilur Rahman, Takeshi Kato: Is beta-secretase linked with Alzheimer's disease? Effect of MK-801 in rat cortex. 43rd Annual Meeting of the Japanese Society for Neurochemistry, Kanazawa, Japan (2000)

POSTER PRESENTATIONS: (*, co-first authors)

1. **Ahmed MM,** Wand ACJ, Boyd T, Solano DA, Vielle A, Markham N, Coughlan CM, Chial HJ, Vergara MN, and Potter H. "Granulocyte-Macrophage Colony-Stimulating Factor Reduces Two Major Pathological Hallmarks of Alzheimer's Disease and Astrogliosis in the TgF344-AD Rat Model." Alzheimer's Association International Conference (AAIC), July 31-August 4, 2022, San Diego, CA, USA.
2. Mihret Elos, Julbert Caneus, **Md. Mahiuddin Ahmed**, Paula M. Grissom, Neil Markham, Noah R Johnson, Heidi J. Chial and Huntington Potter. "Role of Elevated Levels of Mosaic Aneuploidy in the Development and Progression of Huntington's Disease." Alzheimer's Association International Conference (AAIC), July 31-August 4, 2022, San Diego, CA, USA.
3. Esteban M Lucero, Ron Freund, Alexandra N. Smith, Noah R Johnson, Breanna Dooling, Emily Sullivan, Olga Prikhodko, **Md. Mahiuddin Ahmed,** David A Bennett, Timothy J. Hohman, Mark DellAcqua, Heidi J Chial, and Huntington Potter. "Increased Expression of Kif11/Kinesin-5 mRNA Offsets Cognitive Deficits in an Alzheimer's Mouse Model, Blocks Aβ -mediated Decreases in Long-Term Potentiation and Spine Density, and is

Associated with Better Cognitive performance in Alzheimer's Patients." Alzheimer's Association International Conference (AAIC), July 31-August 4, 2022, San Diego, CA, USA.

4. M. Natalia Vergara, Conner Secora, Anne Vielle, Athena Ching-Jung Wang, Patricia Lenhart, Ernesto Salcedo, Noah R. Johnson, **Md. Mahiuddin Ahmed**, Heidi J. Chial, Timothy D. Boyd and Huntington Potter. "Traumatic Brain Injury Exacerbates Retinal Alzheimer's Disease Histopathology in the TgF344 Rat Model." Alzheimer's Association International Conference (AAIC), July 31-August 4, 2022, San Diego, CA, USA.
5. **Ahmed MM,** Wand ACJ, Boyd T, Solano DA, Vielle A, Markham N, Coughlan CM, Chial HJ, Vergara MN, and Potter H. "Granulocyte-Macrophage Colony-Stimulating Factor Reverses Alzheimer's Disease Pathology in the TgF344-AD Rat Model." Alzheimer's Association International Conference (AAIC), July 26-30, 2021, Denver, CO, USA.
6. **Ahmed MM,** Wand ACJ, Boyd T, Elos M, Chial HJ, Gardiner KJ, and Potter H. **"**GM-CSF Reverses Memory Deficits in Normal Aged Mice and in the Dp(16)1Yey Mouse Model of Down Syndrome." Alzheimer's Association International Conference (AAIC), July 14-18, 2019, Los Angeles, CA, USA.
7. **Ahmed MM**, Wang ACJ, Boyd T, Elos M, Gardiner KJ, and Potter H: "TREATMENT WITH GRANULOCYTE-MACROPHAGE COLONY-STIMULATING FACTOR IMPROVES COGNITION IN AGING MICE AND IN A MOUSE MODEL OF DOWN SYNDROME". 3rd International Conference, Trisomy 21 Research Society, Barcelona, Spain, 6-9 June, 2019.
8. **Md. Mahiuddin Ahmed,** Athena Ching Jung Wang, Timothy Boyd, Mihret Elos, Katheleen J Gardiner , and Huntington Potter. "GM-CSF Reverses Memory Deficits in the Dp16 Mouse Model of Down Syndrome". Alzheimer's Association International Conference (AAIC), July 22-26, 2018, Chicago, Illinois, USA.
9. **Md. Mahiuddin Ahmed,** Athena Ching Jung Wang, Timothy Boyd, Mihret Elos, Katheleen J Gardiner , and Huntington Potter. "GRANULOCYTE-MACROPHAGE COLONY STIMULATING FACTOR RESCUES MEMORY DEFICITS IN THE Dp16 MOUSE MODEL OF DOWN SYNDROME". 2nd International Conference of the T21RS
   June 7-11, Chicago, Illinois, USA, 2017
10. Carrel AJ*, **Ahmed MM***, Thomas AX, Gardiner KJ, Brooks-Kayal AR. "Signaling pathway perturbations in mouse and human epilepsies". American Epilepsy Society, Philadelphia, PA, 2015
11. Carrel AJ*, **Ahmed MM***, Thomas AX, Brooks-Kayal AR, Gardiner KJ." Signaling pathway perturbations in mouse and human epilepsies". University of Colorado Neuroscience Program Retreat, Estes Park, CO, 2015
12. **Ahmed MM**, Carrel A, Dhanasekaran AR, Camuto A, O'Neil B, Handler M, Brooks-Kayal A, Gardiner KJ: "Molecular Correlates in the human epileptic Brain". Neuroscience Retreat Program, University of Colorado Denver, 2014
13. Block A, **Ahmed MM**, Verden D, Dhanasekaran AR, Gardiner KJ: "Learning and Memory

and how Sexes aren't equal". Neuroscience Retreat Program, University of Colorado Denver, 2014

14. Campbell CH, **Ahmed MM**, Block A, Dhanasekaran AR, Gardiner KJ: "Protein Perturbations Caused by Trisomy of a novel combination of HSA21 genes". Neuroscience Retreat Program, University of Colorado Denver, 2014
15. Li KX, Liu B, Chowdhury SJ, Frost JL, Block A, **Ahmed MM**, Gardiner KJ, Lemere CA: "Age-related changes and gender differences in the Down syndrome Dp(10)1 Yey mouse brain". SFNB's 44th Annual Meeting, Washington DC, November 15-19, 2014
16. **Ahmed MM,** Dhanasekaran AR, Costa AC, Tong S, Gardiner KJ: "Protein dynamics associated with successful learning and their perturbation in Ts65Dn mice." Workshop on cognition in Down Sundrome Molecular, Cellular and Behavioral Features and the Promise of Pharmacotherapies, Wasington, DC, USA (April 13-15, 2013)
17. Block A, **Ahmed MM**, Dhanasekaran AR, Gardiner KJ: "Protein profiles in the Dp(10)1Yey and Dp(17)1Yey mice predict novel pathway perturbations in the Down syndrome brain and sex-specific abnormalities in protein levels". Workshop on cognition in Down Sundrome Molecular, Cellular and Behavioral Features and the Promise of Pharmacotherapies, Wasington, DC, USA (April 13-15, 2013)
18. **Ahmed MM,** Dhanasekaran AR, Gardiner KJ: **"**Protein Profiles in Learning and Memory." 2nd Reverse Phase Protein Array Global Workshop, University of Edinburgh, Edinburgh, Scotland (Nov 12-13, 2012)
19. Block A, **Ahmed MM,** Dhanasekaran AR, Gardiner KJ: "Novel protein abnormalities, and their sex specificities in mouse models of Down syndrome." Neuroscience Retreat Program, University of Colorado Denver, 2012.
20. **Ahmed MM**, Sturgeon X, Ellison M, Dubach D, Davisson MT, Costa AC, Gardiner KJ: "Reverse Phase Protein Arrays: applications to mouse models of Down syndrome". Reverse Phase Protein Array Global workshop, MD Anderson Cancer Center, University of Texas, Houston, USA (Oct 10-11, 2011).
21. **Ahmed MM,** Sturgeon X, Ellison M, Dubach D, Davisson MT, Costa AC, Gardiner KJ: "Correlations among components of pathways and complexes are lost in mouse models of Down syndrome and rescued by memantine" Neuroscience Program Retreat, University of Colorado Denver, USA (2011)
22. **Ahmed MM,** Dubach D, Sturgeon X, Ellison M, Costa AC, Gardiner KJ: "Pathway perturbations in mouse models of Down Syndrome". Synapses: From Molecules to Circuits & Behavior; Cold Spring Harbor Lab, NY, USA: April12-16, 2011.
23. **Ahmed MM**, Dubach D, Sturgeon X, Ellison M, Costa AC, Gardiner KJ: Analysis of pathway perturbations in mouse models of Down Syndrome. RMRNG meeting, Colorado, USA, (2011)
24. **Ahmed MM**, Dubach D, Gardiner KJ: Protein profiling in mouse model of Down Syndrome: Postdoctoral Research day, 2010.
25. **Ahmed MM**, Dubach D, Sturgeon X, Costa AC, Gardiner KJ: Pathway perturbations in mouse models of Down Syndrome. Neuroscience Program Retreat, University of Colorado Denver, USA (2010)
26. **Ahmed MM**, Dubach D, Sturgeon X, Costa AC, Gardiner KJ: Pathway perturbations in mouse models of Down Syndrome. Coleman Institute Conference, 2010
27. **Ahmed MM**, Dubach D, Gardiner KJ: Protein profiling in mouse model of Down Syndrome: RMRNG meeting, Colorado, USA, (2010)

28. **Ahmed MM,** Dubach D, Gardiner KJ: Protein profiling in mouse model of Down Syndrome: Neuroscience Program Retreat, University of Colorado Denver, USA (2009)
29. **Md. Mahiuddin Ahmed,** Toshiyuki Chikuma, Takeshi Kato: Differential effect of MK-801 on protease activities and glial cell expression in PTZ- induced male and female rat brain. 46th Annual Meeting of the Japanese Society for Neurochemistry, Niigata, Japan (2003)
30. Yukiko Kumabe, **Md. Mahiuddin Ahmed**, Toshiyuki Chikuma, Takeshi Kato: DNA chip study on mRNA expression profiles in the brain regions of MK-801 treated rat: Alzheimer's disease model. 46th Annual Meeting of the Japanese Society for Neurochemistry, Niigata, Japan (2003)
31. **Md. Mahiuddin Ahmed**, Masaru Yamamoto, Toshiyuki Chikuma, Takeshi Kato: Effect of MK-801, an NMDA receptor antagonist, on BACE and EP 24.15 in rat brain. 45th Annual Meeting of the Japanese Society for Neurochemistry, Sapporo, Japan(2002)
32. Masaru Yamamoto, Toshiyuki Chikuma, Atsue Yamashita, Mitsune Yamaguchi, Hiroshi Hojo**, Md. Mahiuddin Ahmed**, Takeshi Kato: Anterograde axonal transport of endopeptidase 24.15 in rat sciatic nerves. 45th Annual Meeting of the Japanese Society for Neurochemistry, Sapporo, Japan (2002)

AWARDS AND HONOR RECEIVED

- Invited as a speaker at the 3rd Reverse Phase Protein Array (RPPA) Global Workshop, Kobe University Integrated Research Center Convention Hall, Kobe, Japan. November 12-13, 2013.
- Received Monbusho Scholarship from the Ministry of Education, Science Sports and Culture, Japan, 1999-2004
- Received scholarship of merit in Bachelor of Science (Honors) in 1994, University of Dhaka, Bangladesh.
- Recipient of Medal and Dean's Award Certificate from the Faculty of Biological Science, University of Dhaka, in 1994.

LEADERSHIP EXPERIENCE

- Member of the organizing committee for the Rocky Mountain Regional Neuroscience Group Annual Meeting, Colorado, USA, 2013.

LANGUAGE SKILLS

Bengali*:* Mother tongue
English*:* Fluent in English
Japanese: Excellent in speaking, reading and writing (Hiragana/Katakana) and can manage daily life conversation well.

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