

## CURRICULUM VITAE

William Christopher (Chris) Risher, PhD  
Associate Professor  
Joan C. Edwards School of Medicine at Marshall University  
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### EDUCATION

Ph.D. Medical College of Georgia, Augusta, Georgia (Neuroscience) 2010  
B.S. Clemson University, Clemson, South Carolina (Biological Sciences, General Honors) 2003

### RESEARCH EXPERIENCE

#### Marshall University

Associate Professor, Dept. of Biomedical Sciences, Joan C. Edwards School of Medicine 2024-Present  
Assistant Professor, Dept. of Biomedical Sciences, Joan C. Edwards School of Medicine 2018-2024

#### Duke University

Postdoctoral Associate, Dr. Cagla Eroglu, Dept. of Cell Biology/Dept. of Neurobiology 2011-2018

#### Medical College of Georgia (Now Augusta University)

Graduate Research Assistant, Dr. Sergei Kirov, Brain and Behavior Discovery Institute 2006-2010  
Graduate Research Assistant, Dr. Kristen Harris, Synapses and Cognitive Neuroscience Center 2004-2006

### AWARDS/HONORS

#### Marshall University (2018-Present)

Distinguished Alumnus, The Graduate School at Augusta University 2023  
10x Genomics + Illumina Multiome ATAC + GE MU Grant Program Winner 2022  
John and Polly Sparks Foundation Investigator 2019  
Society for Neuroscience Annual Meeting, "Hot Topic" Poster Presentation 2019  
(Only ~100 out of more than 14,000 submitted abstracts chosen for this recognition)  
Brain & Behavior Research Foundation NARSAD Young Investigator Award 2018

#### Duke University (2011-2018)

Best Postdoc Poster (Runner-up), Neuroimmunology & Glia Group Spring Symposium, Chapel Hill, NC 2017  
Best Postdoc Poster, Neuroimmunology and Glia Group Spring Symposium, Chapel Hill, NC 2016  
Best Postdoc Talk, Cell Biology Retreat, Beaufort, NC 2014  
Best Postdoc Talk, Neurobiology Retreat, Wilmington, NC 2013  
International Journal of Biochemistry and Cell Biology Poster Prize, FASEB Science Research Conference on Matricellular Proteins in Development, Health & Disease, Saxtons River, VT 2013  
Best Postdoc Poster, Neurobiology Retreat, Wilmington, NC 2012  
Honorable Mention, Best Postdoc Poster, Cell Biology Retreat, Wilmington, NC 2012

#### Medical College of Georgia (2004-2010)

Award of Excellence in Research, Graduate Research Day 2009

#### Clemson University (1999-2003)

Magna cum Laude, General Honors 2003  
National Society of Collegiate Scholars 2001-2003  
Golden Key National Honor Society 2002-2003  
Abney Foundation Scholar 1999-2003  
Palmetto Fellows Scholar 1999-2003

### PEER-REVIEWED PUBLICATIONS

<https://www.ncbi.nlm.nih.gov/myncbi/william.risher.1/bibliography/public/>

Niebergall EB, Weekley D, Mazur A, Olszewski NA, DeSchepper KM, Radant N, Vijay AS, **Risher WC**. 2024. Abnormal morphology and synaptogenic signaling in astrocytes following prenatal opioid exposure. *Cells*

13(10), 838. "The Emerging Role of Astrocytes in Health and Neurological Diseases" Special Issue. doi: 10.3390/cells13100837

Bogges T, **Risher WC**. 2022. Clinical and basic research investigations into the long-term effects of prenatal opioid exposure on brain development. *J Neurosci Res*: "Opioids" Special Issue. PMID: 32459039. doi: 10.1002/jnr.24642 (*Invited Review*)

Bogges T, Williamson JC, Niebergall EB, Sexton H, Mazur A, Egleton RD, Grover LM, **Risher WC**. 2021. Alterations in excitatory and inhibitory synaptic development within the mesolimbic dopamine pathway in a mouse model of prenatal drug exposure. *Front Pediatr* 9: 794544. "The Neurology and Neurobiology of Neonatal Abstinence Syndrome" Research Topic (Clemens KJ, Jantzie L, and Oei JL, Eds.). PMID: PMC8710665. doi: 10.3389/fped.2021.794544

Mazur A, Bills EH, DeSchepper KM, Williamson JC, Henderson BJ, **Risher WC**. 2021. Astrocyte-derived thrombospondin induces cortical synaptogenesis in a sex-specific manner. *eNeuro* 8(4). PMID: PMC8328272. doi: 10.1523/ENEURO.0014-21.2021

Brayman VL, Taetzsch T, Miko M, Dahal S, **Risher WC**, Valdez G. 2021. Roles of the synaptic molecules Hevin and SPARC in mouse NMJ development and repair. *Neurosci Lett*. 746:135663. PMID: PMC8418192. doi: 10.1016/j.neulet.2021.135663

**Risher WC**, Eroglu C. 2020. Emerging roles for  $\alpha 2\delta$  subunits in calcium channel function and synaptic connectivity. *Curr Opin Neurobio* 63: 162-9. Cellular Neuroscience Special Issue (Schwarz T and Cline H, Eds.). PMID: PMC7483897. doi: 10.1016/j.conb.2020.04.007 (*Invited Review*)

Walker CD, **Risher WC**, Risher ML. 2020. Regulation of synaptic development by astrocyte signaling factors and their emerging roles in substance abuse. *Cells* 9(2): E297. PMID: PMC7072591. doi: 10.3390/cells9020297 (*Invited Review*)

**Risher WC**, Kim N, Koh S, Choi JE, Mitev PR, Spence EF, Pilaz LJ, Wang D, Feng G, Silver DL, Soderling SH, Yin HH, Eroglu C. 2018. Thrombospondin receptor alpha-2-delta-1 promotes synaptogenesis and spinogenesis via postsynaptic Rac1. *J Cell Bio* 217(10): 3747-65. PMID: PMC6168259. doi: 10.1083/jcb.201802057

Risher ML, Sexton HG, **Risher WC**, Wilson WA, Fleming RL, Madison RD, Moore SD, Eroglu C, Swartzwelder HS. 2015. Adolescent Intermittent Alcohol Exposure: Dysregulation of Thrombospondins and Synapse Formation are Associated with Decreased Neuronal Density in the Adult Hippocampus. *Alcohol Clin Exp Res* 39(12): 2403-13. PMID: PMC4712076. doi: 10.1111/acer.12913

Risher ML, Fleming RL, **Risher WC**, Miller KM, Klein RC, Wills T, Acheson SK, Moore SD, Wilson WA, Eroglu C, Swartzwelder HS. 2015. Adolescent intermittent alcohol exposure: Persistence of a structural and functional hippocampal abnormalities into adulthood. *Alcohol Clin Exp Res* 39(6): 989-97. PMID: PMC4452443. doi: 10.1111/acer.12725

**Risher WC**, Patel S, Kim IH, Uezu A, Bhagat S, Wilton DK, Pilaz LJ, Singh Alvarado J, Calhan OY, Silver DL, Stevens B, Calakos N, Soderling S, Eroglu C. 2014. Astrocytes refine cortical connectivity at dendritic spines. *eLife* 3:e04047. PMID: PMC4286724. doi: 10.7554/eLife.04047

**Risher WC**, Ustunkaya T, Singh Alvarado J, Eroglu C. 2014. Rapid Golgi analysis method for efficient and unbiased classification of dendritic spines. *PLOS ONE* 9(9):e107591. PMID: PMC4160288. doi: 10.1371/journal.pone.0107591

McKinstry SU, Karadeniz YB, Worthington AK, Hayrapetyan VY, Ozlu MI, Serafin-Molina K, **Risher WC**, Ustunkaya T, Dragatsis I, Zeitlin S, Yin HH, Eroglu C. 2014. Huntingtin is required for normal excitatory synapse development in cortical and striatal circuits. *J. Neurosci* 34(28): 9455-72. PMID: PMC4087216. doi: 10.1523/JNEUROSCI.4699-13.2014

**Risher WC**, Croom D, Kirov SA. 2012. Persistent astroglial swelling accompanies rapid reversible dendritic injury during stroke-induced spreading depolarizations. *Glia* 60(11): 1709-20. PMID: PMC3435464. doi: 10.1002/glia.22390

**Risher WC**, Eroglu C. 2012. Thrombospondins as key regulators of synaptogenesis in the central nervous system. *Matrix Biology* 31(3): 170-7. PMID: PMC3961754. doi: 10.1016/j.matbio.2012.01.004

**Risher WC**, Lee MR, Hess DC, Kirov SA. 2011. Dibucaine mitigates spreading depolarization in human neocortical slices and prevents acute dendritic injury in the ischemic rodent neocortex. *PLOS ONE* 6(7): e22351. PMID: PMC3137632. doi: 10.1371/journal.pone.0022351

**Risher WC**, Ard D, Yuan J, Kirov SA. 2010. Recurrent spontaneous spreading depolarizations facilitate acute dendritic injury in the ischemic penumbra. *J. Neurosci* 30(29): 9859-68. PMID: PMC2918261. doi: 10.1523/JNEUROSCI.1917-10.2010

**Risher WC**, Andrew RD, Kirov SA. 2009. Real-time passive volume responses of astrocytes to acute osmotic and ischemic stress in cortical slices and in vivo revealed by two-photon microscopy. *Glia* 57(2): 207-21. PMID: PMC2635108. doi: 10.1002/glia.20747

## PREPRINTS

Savage JT, Ramirez J, **Risher WC**, Irala D, Eroglu C. June 28, 2023. SynBot: An open-source image analysis software for automated quantification of synapses. Biorxiv. doi: 10.1101/2023.06.26.546578

## BOOK CHAPTERS

**Risher WC**, Eroglu C. 2020. Astrocytes and synaptogenesis. In "Synapse Development and Maturation, 1st Edition". Rubenstein J, Rakic P (Eds.). Academic Press (Elsevier), Cambridge, MA. Pages 55-75. 10.1016/B978-0-12-823672-7.00003-X

## INVITED TALKS

"Mechanisms of astrocyte dysfunction following prenatal opioid exposure." Keynote Speaker, Eroglu Annual Lab Retreat. Durham, NC. May 2023

"Sex, drugs, and astrocytes: How do sex differences and prenatal opioid exposure affect astrocyte-mediated synaptic development?" Augusta University, Augusta, GA. November 2022.

"Regulation of astrocyte-mediated synaptic development by sex differences and prenatal drug exposure." Hope College, Holland, MI. September 2022.

"Investigating the effects of early-life opioid exposure on brain connectivity." WVU Recovers: An Integrated Approach to Substance Use Disorder Recovery. West Virginia Wesleyan College, Buckhannon, WV. September 2019.

"The unsung 'stars' of the brain: How do astrocytes control cortical development?" Albany Medical College, Albany, NY. April 2017.

## CONFERENCE/MEETING PRESENTATIONS (LAST 5 YEARS)

Risher WC. "Wired differently: How biological sex and prenatal drug exposure shape astrocyte-mediated synaptic development." Oral Presentation. Symposium: Astrocytes at the synapse: from development to beyond. American Society for Neurochemistry Annual Meeting. Portland, OR. April 2024.

Williamson JC, Mazur A, Moll B, Risher WC. "Sex differences in alpha-2-delta-1-mediated synaptic development: Regulation by estrogen." Society for Neuroscience Annual Meeting. Washington, DC. November 2023.

Lyu B, Risher WC, Yu G. "Machine learning approaches for segmenting dendrite compartments and quantifying subcellular structures on volumetric EM data." 9th Annual BRAIN Initiative Meeting: Open Science, New Tools. Bethesda, MD. June 2023.

Mazur A, Williamson JC, Niebergall EB, Weekley D, Radant, Henderson BJ, Risher WC. "Sex, drugs, and astrocytes: How do biological sex and prenatal drug exposure influence astrocyte-mediated synaptic development?" Gordon Research Conference on Glial Biology: Functional Interactions Among Glia and Neurons. Ventura, CA. March 2023.

Risher WC. "Sex, drugs, and astrocytes: How do sex differences and prenatal opioid exposure affect astrocyte-mediated synaptic development?" Oral Presentation. Minisymposium: Diverse functional aspects of astrocyte-neuron interactions in health and disease. Society for Neuroscience Annual Meeting. San Diego, CA. November 2022.

Bogges T, Mazur A, Williamson JC, DeSchepper KM, Olszewski NA, Vijay AS, Risher WC. "Disruptions in astrocyte-mediated synaptic development following prenatal opioid exposure." Glia in Health & Disease. Cold Spring Harbor Laboratory, NY. July 2022.

Bills EH, Mazur A, Henderson BJ, Risher WC. "Male bias in thrombospondin-induced synaptogenesis: Evidence for sex differences in astrocyte-synaptic signaling." Glia in Health & Disease. Virtual. July 2020.

Bogges T, Mazur A, Sexton H, Setola V, Lander L, Egleton RD, Denvir J, Risher WC. "Investigating the role of astrocytes in the development of synaptic connectivity in a rodent model of neonatal abstinence syndrome." Society for Neuroscience Annual Meeting. Chicago, IL. October 2019.

Bogges T, Brown S, Mazur A, Stevens J, Chaffin DG, Setola V, Lander L, Egleton RD, Denvir J, Risher WC. "Investigating the role of astrocyte-neuron signaling in the development of aberrant synaptic circuits in neonatal abstinence syndrome." Gordon Research Conference on Excitatory Synapses and Brain Function. Manchester, NH. June 2019.

Bogges T, Risher WC. "Co-abuse of gabapentin in addition to opioids uniquely alters synaptic development in mouse models of neonatal abstinence syndrome." AAP/ASCI/APSA Joint Meeting. Chicago, IL. April 2019.

Bogges T, Brown S, Mazur A, Stevens J, Chaffin DG, Setola V, Lander L, Egleton RD, Denvir J, Risher WC. "Investigating the role of astrocyte-neuron signaling in the development of aberrant synaptic circuits in neonatal abstinence syndrome." West Virginia Clinical and Translational Science Institute (WVCTSI) Annual Meeting. White Sulphur Springs, WV. April 2019.

Bogges T, Brown S, Mazur A, Stevens J, Chaffin DG, Setola V, Lander L, Egleton RD, Denvir J, Risher WC. "Investigating the role of astrocyte-neuron signaling in the development of aberrant synaptic circuits in neonatal abstinence syndrome." Gordon Research Conference on Glial Biology: Functional Interactions Among Glia and Neurons. Ventura, CA. March 2019.

Risher WC, Kim N, Koh S, Choi JE, Mitev PR, Spence EF, Pilaz LJ, Wang D, Feng G, Silver DL, Soderling SH, Yin HH, Eroglu C. "How do astrocyte-secreted thrombospondins and their neuronal receptor alpha-2-delta-1 shape cortical connectivity?" Glia in Health & Disease. Cold Spring Harbor Laboratory, NY. July 2018.

## **GRANTS AWARDED**

*NSF Established Program to Stimulate Competitive Research (EPSCoR) RII Track 1*  
*OIA-2242771*

06/01/23-05/31/28

Title: West Virginia Network for Functional Neuroscience and Transcriptomics (WV-NFNT)

This project will examine the ability of the nervous system to change during development and in response to stimuli. WV-NFNT will expand the capability and diversity of those working in the fields of neuroscience and

data science by implementing specific education and workforce development activities that will engage students, especially rural, first-generation college students, and those from other groups traditionally underrepresented, in these research areas. New collaborations among neuroscientists and bioinformaticists from four institutions across the state will position West Virginia to be a center for neuroscience research.  
Role: Theme 2 Research Lead (PI: Juliana Serafin, WV Higher Education Policy Commission)

*West Virginia Clinical and Translational Science Institute Open Competition RFA* 02/01/23-01-31/24  
Title: Disruptions in tripartite synaptic development following prenatal opioid exposure  
The goal of this pilot project is to understand the structural and functional consequences of prenatal opioid exposure on astrocyte/synaptic interactions in the developing brain.  
Role: PI

*NIH/NIMH 1 R15 MH126345-01* 04/01/21-03/31/24  
Title: Investigating sex differences in astrocyte-mediated synaptic development  
This application is for continued support of our investigation into novel sex-dependent mechanisms of astrocyte-dependent synaptogenesis. As part of the R15 REAP program, this award is focused on exposing students to meritorious research.  
Role: PI

*West Virginia IDeA Network of Biomedical Research Excellence (WV-INBRE) Chronic Disease Research Program* 09/01/20-08/31/22  
Title: Effects of prenatal opioid exposure on astrocyte-mediated synaptic connectivity  
This project, which falls under the WV-INBRE CDRP's 'addiction' category, aims to identify novel molecular targets influencing astrocyte and synapse development that are altered following prenatal drug exposure.  
Role: PI

*Brain & Behavior Research Foundation NARSAD Young Investigator Award 27662* 01/15/19-07/21/21  
Title: Astrocytic regulation of synaptic connectivity in neonatal abstinence syndrome  
This project was designed to understand the mechanisms underlying disrupted brain connectivity in a rodent model of neonatal abstinence syndrome (NAS), a state of withdrawal in infants born to mothers who abused opioids during pregnancy. The project was recently funded by the John and Polly Sparks Foundation through the BBRF's Research Partners Program.  
Role: PI

*NIH/NINDS F32 NS083283* 07/01/13-07/01/15  
Title: Control of excitatory synapse formation and maturation by astrocytes  
This project was designed to investigate the roles of the astrocyte-secreted proteins thrombospondin, hevin and SPARC in synapse formation and development.  
Role: PI (Sponsor: Cagla Eroglu [Duke University], Co-Sponsors: Vann Bennett, Nicole Calakos)

*NIH T32 NS511566* 02/04/11-02/03/12  
Title: Investigation of the functional role of astrocyte-mediated synaptogenesis in vivo  
This project was designed to investigate the role of the thrombospondin receptor, alpha-2-delta-1, in developmental and injury-mediated synaptogenesis in vivo.  
Role: Trainee (PI: Cagla Eroglu [Duke University])

*NIH/NINDS F31 NS064753* 03/01/10-12/10/10  
Title: Neuronal and astroglial injury and recovery from stroke-induced depolarizations  
The goal of this project was to use real-time in vivo 2-photon microscopy to understand the mechanism of cellular injury and recovery in the wake of ischemic depolarizations in mouse models of stroke.  
Role: Trainee (PI: Sergei Kirov [Medical College of Georgia])

## **PRESS RELEASES**

<https://www.worldhealth.net/news/non-neuronal-cells-drive-sex-differences-early-brain-development/>

<https://www.usnews.com/news/best-states/west-virginia/articles/2021-03-24/marshall-university-to-get-400k-for-mental-health-research>

[https://www.herald-dispatch.com/news/marshall-university-scientist-earns-national-support-for-nas-research/article\\_df94a870-6d7d-5b2c-b4d1-7265a53f7377.html](https://www.herald-dispatch.com/news/marshall-university-scientist-earns-national-support-for-nas-research/article_df94a870-6d7d-5b2c-b4d1-7265a53f7377.html)

## **TEACHING EXPERIENCE**

### **Marshall University**

MSI Structure & Function II Neuroanatomy/Neural Network for first-year medical students in the Joan C. Edwards School of Medicine (Lecturer; Spring 2019-Current); Neuroanatomy “Refresher” lectures for Neurology residents (Fall 2019-Spring 2021); MS1/MS2 Clinical Reasoning (Facilitator; Spring 2020-Current); Neurobiology of Addiction I BMR650 – Opiates (Lecturer; Fall 2021-Current); Neuroscience and Developmental Biology Literature Review (Course Director; Spring 2023-Current)

### **Duke University**

Participated in the Neurobiology of Disease Course (Jan-Feb 2012) in which I gave a lecture and led class discussion on the topic of addiction with graduate students and postdocs; Taught a class on brain morphogenesis for the Program of Cell and Molecular Biology (Sept 2015)

### **Medical College of Georgia**

Assisted in the organization of lecture materials for Dr. Sergei Kirov; Led discussion once per semester in the Synapse Journal Club, presenting recently published papers to fellow graduate students, postdocs and faculty

## **MENTORING EXPERIENCE**

### Graduate Students

*Olivia Coulter* (PhD Student, Marshall University)

*Daron Weekley* (Graduate Rotation Student, Marshall University)

*Samuel Tetteh-Quarshie* (PhD Student [Committee Member], Marshall University)

*Nate Olszewski* (PhD Rotation Student [Committee Member], Marshall University)

*Jakob Adkins* (PhD Rotation Student, Marshall University)

*Kayla DeSchepper* (Masters Student, Marshall University); Currently: BMS PhD student

*Christopher Walker* (PhD Student [Committee Member], Marshall University); Currently: Postdoctoral scholar at the Medical University of South Carolina

*Taylor Boggess* (MD/PhD Student [Primary Mentor], Marshall University); Currently: MUSOM Class of '24

*Skylar Cooper* (PhD Student [Committee Member], Marshall University); Currently: MUSOM Class of '26

*Shanai Brown* (Masters Student, Marshall University); Currently: Applications Specialist, VELP Scientifica

*Cecilia Sierra* (PhD Rotation Student, Marshall University)

*Petar Mitev* (Graduate Rotation Student, Duke University); Currently: PhD student at Karolinska Institutet

*Valerie Tornini* (PhD Rotation Student, Duke University); Currently: Assistant Professor at UCLA

*Jeremy Sword* (PhD Graduate Student, Medical College of Georgia); Currently: Staff scientist, MCG

*Joshua Farrow* (Graduate Rotation Student, Medical College of Georgia); Currently Assessment and Intake Specialist, Paragon Autism Services, LLC

### Undergraduate Scholars

*Emily Akers* (BS to MD Program)

*Bree Moll* (WV-INBRE Summer Intern, Marshall University)

*James Williamson* (Recipient of NASA WV Space Grant Consortium Research Fellowship Award, 2022)

*Ethan Niebergall* (Recipient of WV-INBRE's Research Internship for HSTA Scholars, 2020, Marshall University); Currently: MUSOM Class of '27

*Ean Bills* (Recipient of Marshall University's Creative Discovery Research Scholar Award, 2019); Currently: MUSOM Class of '25

*Ji-Eun Choi* (Duke University); Currently: Clinical social worker at Massachusetts General Hospital

*Haining Yang* (Duke University); Currently: Growth Project Lead, Sanofi (China)

*Sagar Patel* (Duke University); Currently: PGY-4 Urology Resident, Baylor College of Medicine

*Brittney Coleman* (Undergraduate, Summer Research Opportunity Program, Duke University)

*Timothy Nyangacha* (Duke University); Currently: Medical student, University of Minnesota

Andrew Williams (Duke University); Currently: Assistant Professor of Ophthalmology, UPMC

### Research Volunteers

Radant (Summer Intern, MUSOM Class of '25)

Aishwarya Vijay (Summer Intern, MUSOM Class of '25)

Jesse Stevens (Marshall University); Currently: School counselor

Jonnathan Singh Alvarado (Duke University); Currently: Postdoctoral scholar at Harvard

Atesh Worthington (Duke University); Currently: PhD ('23) from UC Santa Cruz

### **SERVICE/COMMUNITY ACTIVITIES**

Biochemistry and Cell Biology, Guest Editor: Marshall University Collection	2022-2023
Joan C. Edwards School of Medicine Faculty Council, Biomedical Sciences Representative	2021-2023
Faculty Mentor, First2 Summer Immersion Research Program	2021
Symposium on Substance Use Research, Abstract Reviewer/Session Moderator	2021
NIH/CSR Cellular and Molecular Biology of Glia (CMBG) Study Section	2021
Marshall University Faculty Senate, School of Medicine Representative	2020-2022
Virtual Social Media Workshop: Part 1 – “Building Your Professional Reputation on Social Media”	2020
- Co-organized and presented a workshop designed to raise awareness for the use of social media (e.g. Twitter) to increase one’s public profile	
NIH/CSR Neuroscience Special Emphasis Panel: Blood Brain Barrier Study Section	2020
Society for Research on Nicotine and Tobacco Annual Meeting, Abstract Reviewer	2020
NIDA Drug Supply Program, Request Reviewer	2020
Marshall University Health Sciences Research Day, Abstract Reviewer/Poster Judge	2019-Present
Marshall Brain Expo, Huntington, WV	2019
- Supervised undergraduates presenting neuroscience-related exhibits to local elementary school students as part of Brain Awareness Week	
KaBOOM! Oakwood Park Playground, Durham, NC	2013
- Participated in building a new playground for a local Durham community	
Brain Awareness Week, Museum of Life and Science, Durham, NC	2013
- Presented neuroscience demonstrations to visitors of all ages	
Brain Awareness Week, Fort Discovery, Augusta, GA	2009
- Assisted other graduate students in presenting basic neuroscience facts to high school students	
Brain Awareness Week, AR Johnson High School, Augusta, GA	2006
- Demonstration of various optical illusions for students at a magnet high school	

### **AD HOC JOURNAL REVIEW ACTIVITY**

*Annals of Biomedical Engineering; Annals of the New York Academy of Sciences; Biological Psychiatry; Brain Research; Cell Death & Differentiation; Cell Reports; Cells; eLife; eNeuro; Frontiers Cell and Developmental Biology; Frontiers in Neuroscience; Glia; International Journal of Molecular Sciences; JAMA; Journal of Neuroscience; Molecular Neurobiology; PLoS ONE; Progress in Neurobiology; Progress in Neuropsychopharmacology & Biological Psychiatry; Reproductive Medicine; Review Commons; Toxicology*

### **EXTRACURRICULAR**

4<sup>th</sup> Gup (Brown Belt) Taekwondo, 2022-2024