Maegan M. Weltzin, Ph.D.

Assistant Professor
University of Alaska Fairbanks
Department of Chemistry & Biochemistry
1930 Yukon Dr.
Fairbanks, AK 99775
P: (907) 474-6527
F: (907) 474-5640
mmweltzin@alaska.edu

EDUCATION

1. **PhD: Biochemistry**
   University of Alaska Fairbanks (UAF)
   Dissertation Title: "Investigation of the Allosteric Modulators Desformylflustrabromine and 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid (HEPES) Interactions on Nicotinic Acetylcholine Receptors"
   Dissertation Advisor: Dr. Marvin K. Schulte
   Defense: June 9, 2011- Passed
   Graduation: August 2011
   GPA: 4.00

2. **Bachelor of Science:** Chemistry Emphasis in Biochemistry
   University of Alaska Fairbanks May 2006
   GPA: 3.5

EMPLOYMENT

08/17-present	University of Alaska, Fairbanks, Fairbanks, AK, Assistant Professor (tenure-track)
07/17-08/17	University of Alaska, Fairbanks, Fairbanks, AK, Adjunct Faculty
05/17-08/17	Alaska State Public Health Virology Laboratory, Fairbanks, AK, Research Technician I
08/16-05/17	American Lung Association, Fairbanks, AK, Manager
03/12-07/16	Barrow Neurological Institute at St. Joseph's Hospital, Phoenix, AZ, Postdoctoral Fellow
01/07-8/11	University of Alaska, Fairbanks, Institute of Arctic Biology, Fairbanks, AK, Graduate Research Assistant
01/05-12/06	University of Alaska, Fairbanks, Institute of Arctic Biology, Fairbanks, AK, Undergraduate Student Assistant
08/05-12/05	University of Alaska, Fairbanks, Department of Civil and Environmental Engineering, Fairbanks, AK, Environmental Chemistry Assistant
08/02-6/04	University of Alaska, Fairbanks, Institute of Arctic Biology, Fairbanks, AK, Undergraduate Student Assistant

SKILLS AND TECHNIQUES

Experience in: experimental design, execution, data analysis, manuscript preparation, public presentations, mentorship, collaborative writing, grantsmanship and classroom teaching.

FELLOWSHIPS AND GRANTS

Submitted

1. **National Institutes of Health. "**Visinin-like protein-1 modulation of nicotinic receptors." ***Status:***

scored, under review. Role: PI ($500,000, 4 years, direct cost)

2. **National Institutes of Health.** "Nicotinic receptor selective cell penetrating peptide for brain cargo delivery." ***Status:*** under review. ($100,000; 2 years, direct costs). Role: PI

Current Funding

1. **Alaska IDeA Network of Biomedical Research Excellence (INBRE) Pilot Research Project Award:** Developing nicotinic acetylcholine receptor subtype selective peptides derived from the rabies virus. ***Status:*** **Funded,** Aug 2021 – Aug 2023. ($150,000). Role: PI
2. **New faculty startup funds** ($130,000, Aug 2017 - current). Role: PI

Completed

1. **Alaska IDeA Network of Biomedical Research Excellence (INBRE) Pilot Research Project Award:** Renewal of "Pharmacology and function of nicotinic receptors altered by an epilepsy mutation." ***Status:*** **Funded,** Aug 2019 – Aug 2021. ($75,000; 1 year with carryforward). Role: PI
2. **Biomedical Learning and Student Training (BLaST) Faculty Pilot Project:** "Rabies glycoprotein interacts with neuronal nicotinic acetylcholine receptors in a subtype-selective manner." ***Status:*** **Funded,** July 2018 – July 2021**.** ($40,000; 2 years with carryforward). Role: PI
3. **Alaska IDeA Network of Biomedical Research Excellence (INBRE) Special Request Award:** "Purchase of electrophysiology equipment to enhance Weltzin lab research capacity." ***Status:*** **Funded, Su 2020.** ($38,284,000; 1 year). Role: PI
4. **Biomedical Learning and Student Training (BLaST) Faculty Pilot Project:** "Purchase of research materials during COVID-19 to increase Weltzin lab research capacity." ***Status:*** **Funded, Su 2020.** ($6,261; 3 months). Role: PI
5. **Alaska IDeA Network of Biomedical Research Excellence (INBRE) Pilot Research Project Award:** "Pharmacology and function of nicotinic receptors altered by an epilepsy mutation." ***Status:*** **Funded,** Aug 2018 – Aug 2019. ($75,000; 1 year). Role: PI
6. **Barrow Neurological Foundation Grant:** "Investigating two novel and sporadic cytoplasmic loop mutations located in the α4 and β2 subunits of nicotinic acetylcholine receptors found in autosomal dominant nocturnal frontal lobe epilepsy." ***Status:*** **Funded, October 2013 - October 2015.** ($120,000; 2 years)**.** Role: PI

Current Funded Research for Graduate Students

1. **AY2023-24. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   Lahra Weber (Graduate Student, Biochemistry and Neuroscience) $56,686
2. **AY2021-23. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   Sarah Suarez (Graduate Student, Biochemistry and Neuroscience) $113,366
3. **AY2022-23. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   Brittany O'Brien (Graduate Student, Biochemistry and Neuroscience) $56,686

Completed Funded Research for Graduate Research Students

1. **AY2020-21. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   Sarah Suarez (Graduate Student, Biochemistry and Neuroscience) $56,686
2. **AY2021-22. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   Sarah Suarez (Graduate Student, Biochemistry and Neuroscience) $56,686

Completed Funded Research for Undergraduate Research Students

1. **AY2020-21. Biomedical Learning and Student Training (BLaST)**
   James McKay (Undergraduate, Biology and Physics) $5,000
2. **AY2020-21. Undergraduate Research & Scholarly Activity (URSA)**
   Bryant Griffith (Undergraduate, Biology) $5,000
3. **Su2020. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   James McKay (Undergraduate, Biology and Physics) $8,540 (Su20)

4. **AY2019-20. Biomedical Learning and Student Training (BLaST)**
   Shelly Thao (Undergraduate, Chemistry) $ 26,597
   Shane Bennett (Undergraduate, Biology) $26,597
   James McKay (Undergraduate, Biology and Physics) $5,000
5. **AY2018-19. Praxis internship program, Smith College**
   Helen Danielson (Undergraduate, Bioengineering) $3,000 (Summer 2019)
6. **AY2018-19. Biomedical Learning and Student Training (BLaST)**
   Shelly Thao (Undergraduate, Chemistry) $5,000 (AY18-19)
   James McKay (Undergraduate, Biology and Physics) $5,000 (AY18-19)
7. **Su 2019. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   James McKay (Undergraduate, Biology and Physics) $9,000 (Summer 2019)
   Shelly Thao (Undergraduate, Chemistry) $9,000 (Summer 2019)
8. **AY2017-18. Biomedical Learning and Student Training (BLaST)**
   Chanta Spain (Undergraduate, B.S., Biology) $2,500 (Spring 2018)
   James McKay (Undergraduate, Biology and Physics) $5,000 (Summer 2018)
   Shelly Thao (Undergraduate, Chemistry) $5,000 (Summer 2018)
9. **AY2017-18. Alaska IDeA Network of Biomedical Research Excellence (INBRE)**
   Chanta Spain (Undergraduate, B.S., Biology) $9,000 (Summer 2018)
10. **AY2017-18. Undergraduate Research and Scholarly Activity (URSA)**
    Paige Geick (Undergraduate, B.S., Biology) $2,500 (Spring 2018)
    James McKay (Undergraduate, Biology and Physics) $2,500 (Spring 2018)

Not Funded Proposals

1. **National Institutes of Health.** "Developing nicotinic acetylcholine receptor subtype selective peptides derived from the rabies virus glycoprotein and alpha-neurotoxins." **Status:** Not funded Role: PI
2. **National Institutes of Health.** "Preclinical advancement of desformylflustrabromine for treatment of ASD." ***Status:*** Not Funded. Role: Bult-Ito (PD) and Weltzin (PI)
3. **National Institutes of Health.** "Developing nicotinic acetylcholine receptor subtype selective peptides derived from the rabies virus glycoprotein, neurotoxins, and prototoxins." ***Status:*** Not Funded. Role: PI
4. **National Institutes of Health:** "Targeting nicotinic receptor subtypes using rabies glycoprotein-fusion peptides." ***Status:*** Not Funded. ($266,943; 2 years). Role: PI
5. **National Institutes of Health:** "Behavioral modifications mediated by rabies virus interactions with neuronal nicotinic acetylcholine receptors." ***Status:*** Not Funded. ($225,000; 2 years). Role: PI
6. **National Science Foundation MRI:** "Acquisition of a high-throughput protein quantification system for enhancing research and teaching at the University of Alaska." ***Status:*** Not Funded. ($196,398; 1 year). Role: Co-investigator

PEER REVIEWED PUBLICATIONS

Published Full-Length Papers

1. O'Brien BCV, Weber L, Hueffer K, **Weltzin MM***. 2023. SARS-CoV-2 spike ectodomain targets α7 nicotinic acetylcholine receptors. J Biol Chem. Apr 13, online a head of print. doi: 10.1016/j.jbc.2023.104707.

   Role: *Corresponding author, idea development, Experimental design, implementation, funding preparation of manuscript .

2. Lian M, Hueffer K, and **Weltzin MM***. 2022. Interactions between the rabies virus and nicotinic acetylcholine receptors: A potential role in rabies virus induced behavior modifications. Heliyon, 8 (90): E10434. doi: https://doi.org/10.1016/j.heliyon.2022.e10434.

   Role: *Corresponding author, literature assembly for review article, idea development, preparation of manuscript

3. **Weltzin MM***, George AA, Lukas RJ and Whiteaker P. 2021. Sleep-related hypermotor epilepsy associated mutations uncover important kinetic roles of α4β2- nicotinic acetylcholine receptor intracellular structures. PLoS One, 16(3): e0247825. doi: 10.1371/journal.pone.0247825.

   Role: *Corresponding author, experimental design, implementation, data analysis, funding and preparation of the manuscript

4. **Weltzin MM***, George AA, Lukas RJ and Whiteaker P. 2019. Distinctive single-channel properties of α4β2-nicotinic acetylcholine receptor isoforms. PLoS One Mar 7; 14(3).

   Role: *Corresponding author, experimental design, implementation, data analysis, funding and preparation of the manuscript

5. **Weltzin MM**, Lindstrom J, Lukas RJ and Whiteaker P. 2016. Distinctive effects of nicotinic receptor intracellular-loop mutations associated with nocturnal frontal lobe epilepsy. Neuropharamcology Mar;102:158-73. (Epub 2015 Nov 10).

   Role: Experimental design, implementation, data analysis, funding, and preparation of the manuscript

6. Lucero LM, **Weltzin MM**, Eaton JB, Cooper JF, Lindstrom JM, Lukas RJ, Whiteaker P. 2015. Differential α4(+)/(-)β2 Agonist Binding Site Contributions to α4β2 Nicotinic Acetylcholine Receptor Function Within and Between Isoforms. J Biol Chem. Dec 7. (Epub ahead of print).

   Role: Experimental design, implementation, data analysis, and preparation of the manuscript

7. **Weltzin MM** and Schulte MK. 2015. Desformylflustrabromine modulates α4β2 nAChR high- and low-sensitivity isoforms at allosteric clefts containing the β2 subunit. J Pharmacol Exp Ther. Aug;354

   Role: Experimental design, implementation, data analysis, funding, and preparation of the manuscript

8. Luo S, Zhangsun D, Schroeder CI, Zhu X, Hu Y, Wu Y, **Weltzin MM**, Eberhard S, Kaas Q, Craik DJ, McIntosh JM, Whiteaker P. 2014. A novel α4/7-conotoxin LvIA from Conus lividus that selectively blocks α3β2 vs. α6/α3β2β3 nicotinic acetylcholine receptors. FASEB J. Apr;28(4):1842-53.

   Role: Evaluated LvIA on α3β2 and α6/α3β2β3 nAChR using two-electrode voltage clamp electrophysiology, analyzed data, and edited manuscript.

9. **Weltzin MM**, Huang Y, Schulte MK. 2014. Allosteric modulation of alpha4beta2 nicotinic acetylcholine receptors by HEPES. Eur J Pharmacol. Jun 5;732:159-68.

   Role: Experimental design, implementation, data analysis, funding, and preparation of the manuscript

10. German N, Kim JS, Jain A, Dukat M, Pandya A, Ma Y, **Weltzin MM**, Schulte MK, Glennon RA. 2011. Deconstruction of the α4β2 Nicotinic Acetylcholine Receptor Positive Allosteric Modulator Desformylflustrabromine.J Med Chem, 54(20):7259-67.

    Role: Tested compounds and analyzed data.

11. **Weltzin, MM** and Schulte MK. 2010. Pharmacological characterization of the allosteric modulator desformylflustrabromine and its interaction with a4b2 nAChR Orthosteric ligands. *JPET*, 334(3):917-26.

    Role: Experimental design, implementation, analysis, funding, and preparation of the manuscript.

12. Kim JS, Padnya A, **Weltzin MM**, Schulte M, Glennon, RA. 2007. Synthesis of desformylflustrabromine and its reevaluation as an $\alpha_4\beta_2$ nACh receptor modulator. Bioorg Med

Chem Lett. 2007 Sep 1;17(17):4855-60.

Role: Assisted largely in the experimentation, analysis, funding, and preparation of the manuscript.

13. **Weltzin M**, Zhao H, Bucci D, Drew KL. 2006. Arousal from hibernation alters contextual learning and memory. Behav Brain Res. Feb 15;167(1):128-33.

    Role: Experimental design, implementation, funding, and aided in the preparation of the manuscript.

14. Zhao H, Bucci D, **Weltzin M**, Drew KL. 2004. Effects of aversive stimuli on learning and memory in wild caught Arctic ground Squirrels. Behav. Brain Res., 151(1-2):219-224.

    Role: Assisted graduate student in experimentation, data analysis, and preparation of the manuscript.

Manuscripts in Preparation or Submitted *(* Corresponding author; ** UAF graduate student author; *** UAF undergraduate student author)*

1. O'Brien, BCV***, Weber, L***, **Weltzin MM*.** Nicotinic receptor selective cell penetrating peptide for brain cargo delivery. (TBD, *in preparation*).
2. Suarez, S**, Danielson H***, **Weltzin MM***. Visinin-like protein-1 modulation of nicotinic receptors. (TBD; *in preparation)*
3. Oruganti S, Iyer S, Wang Z, Adhikari K, Gupta M, Ondrechen MJ, **Weltzin MM** and Loring RH. Decoding RIC3 and NACHO chaperone actions on α7 nicotinic receptor expression using α7-5HT3 chimeras. (Molecules; *in preparation).*

   Role: Data collection, experimental design, data analysis, preparation of the manuscript.
4. Thao S***, O'Brien B**, Danielson H**, Spain C***, Hueffer K, and **Weltzin MM***. Rabies viral glycoprotein peptide inhibition of neuronal nicotinic acetylcholine receptor subtypes. (JGP; ***submitted****).*

   Role: *Corresponding author, experimental design, data collection, analysis, funding, and preparation of the manuscript
5. Smith T**, McKay J***, and **Weltzin MM***. A pharmacological investigation of sleep-related hypermotor epilepsy implicated nicotinic receptors containing α5 and α3 accessory subunits. (*In preparation).*

   Role: *Corresponding author, experimental design, analysis, funding, and preparation of the manuscript

National and International Abstracts *(* Corresponding author; ** UAF graduate student author; *** UAF undergraduate student author)*

1. O'Brien BCV**, Weber L**, **Weltzin MM***. Design and optimization of nicotinic acetylcholine receptor subtype selective peptides. Biophysical Society annual meeting 2023. San Diego CA. February 2023.
2. Weber L**, O'Brien BCV**, **Weltzin MM***. Cytotoxicity and internalization properties of novel alpha7 nicotinic receptor selective peptides. Biophysical Society annual meeting 2023. San Diego CA. February 2023.
3. Suarez, S**, Danielson H***, **Weltzin MM*.** VILIP-1 modulates nicotinic receptor subtypes**.** Society for Neuroscience 2022. San Diego, CA. November 2022
4. O'Brien** and **Weltzin MM***. Nicotine enhances SARS-CoV-2 glycoprotein functional modulation

of the alpha7 nicotinic acetylcholine receptor. Society for Neuroscience 2021. Virtual. November 2021.

5. **Weltzin MM***, Danielson H***, Suarez S**. Sleep-related Hypermotor Epilepsy-Associated Mutation Disrupts Native Modulator VILIP-1 Interactions With α4β2 Nicotinic Receptors. 2021 ACS Northwest Regional Meeting. Virtual. May 2021.
6. Suarez S**, Danielson H***, **Weltzin MM***. Epilepsy Associated Mutation Disrupts VILIP-1 Modulation of Nicotine Receptors. American Association for the Advancement of Science (AAAS) Annual Meeting. Virtual. February 2021.
7. Thao S***, Spain C***, Hueffer K and **Weltzin MM***. Rabies viral glycoprotein inhibition of neuronal nicotinic acetylcholine receptor subtypes. Society for Neuroscience 2019. Chicago, IL. October 2019.
8. McKay J***, Smith T**, and **Weltzin MM***. An Examination of Nocturnal Frontal Lobe Epilepsy Associated Mutations in Subtypes of Neuronal Nicotinic Acetylcholine Receptors. Society for Neuroscience 2019. Chicago, IL. October 2019.
9. Hueffer K, Thao S***, Spain C*** and **Weltzin MM***. Inhibition by rabies glycoprotein neurotoxin like peptide differs between nicotinic acetylcholine receptor subtypes. 30th Annual Rabies in the Americas. Chicago, IL. October 2019.
10. **Weltzin MM**, George AA, Lukas RJ and Whiteaker P. Occupation of the alpha4(+)/alpha4(-) subunit interface enhances function of the low sensitivity alpha4beta2nicotinic acetylcholine receptor isoform by destabilization of receptor closed states. Society for Neuroscience 2016. San Diego. October 2016.
11. **Weltzin MM**, George AA, Lukas RJ and Whiteaker P. A Single-Channel Investigation of Mutated nAChRs Implicated in Nocturnal Frontal Lobe Epilepsy. nAChR Satellite Conference 2015. Chicago, IL. October 2015.
12. **Weltzin MM**, Purohit P, George A, Lukas RJ and Whiteaker P. A Single-Channel Investigation of Mutated nAChRs Implicated in Nocturnal Frontal Lobe Epilepsy. nAChR 2014. Cambridge, UK. July 2014.
13. **Weltzin MM**, Wu J, Lukas RJ and Whiteaker P. Effects of novel nocturnal frontal lobe epilepsy-associated nicotinic acetylcholine receptor mutations. Society for Neuroscience Conference. San Diego, CA. Nov. 2013.
14. **Weltzin MM**, Eaton JB, Lukas RJ, McIntosh JM and Paul Whiteaker. Evaluation of α-conotoxins on α6/α3β2β3 and α3β2 nAChRs. Society for Neuroscience Conference. New Orleans, LA. Oct. 2011.
15. **Weltzin MM** and Schulte MK. Non-orthosteric subunit faces are involved in alpha4beta2 nAChR responses to acetylcholine and desformylflustrabromine in high and low sensitive receptor preparations. Society for Neuroscience Conference. Washington, DC. Nov. 2011.
16. **Weltzin MM** and Schulte MK. Allosteric modulation of alpha4beta2 nicotinic acetylcholine receptors by 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid. Society for Neuroscience Conference, San Diego, CA. Nov. 2010.
17. **Weltzin MM** and Schulte MK. Investigating allosteric potentiation of the alpha4beta2 neuronal nicotinic acetylcholine receptor subtypes**.** Neuroscience, Chicago, IL. Nov. 2009.
18. **Weltzin M**, Padnya A and Schulte MK. Functional characterization of the allosteric modulator des-formylflustrabromine and its interaction with $\alpha_4\beta_2$ nAChR orthosteric ligands. University of Alaska Biomedical Research Conference, Fairbanks, AK, Spring 2009.
19. **Weltzin M**, Padnya A, Edmonds BW, Schulte MK. Mechanisms of Potentiation by Des-formylflustrabromide of neuronal nicotinic acetylcholine receptors. NINBRE, Washington, DC, August 2008.
20. **Weltzin M**, Padnya A, Edmonds BW, Schulte MK. Mechanisms of Des-formylflustrabromidepotentiation of neuronal nicotinic acetylcholine receptors. Society for Neuroscience Conference, Nov 2008, Washington, DC.
21. Kim JS, Padnya A, **Weltzin M**, Edmonds BW, Schulte MK, Glennon RA. Synthesis of desformylflustrabromine and its evaluation as an alpha4beta2 and alpha7 nAChR modulator.

Society for Neuroscience, Nov. 3-7, 2007, San Diego, CA.

22. **Weltzin M**, Zhao H, Bucci D, Drew KL. Arousal from hibernation alters contextual learning and memory. EPSCoR's 18th Annual Conference, September 2005, Puerto Rico.
23. **Weltzin M**, Zhao H, Bucci D, Drew KL. Enhanced fear conditioning after arousal from hibernation in arctic ground squirrel. Society for Neuroscience, November 4-9, 2003, New Orleans, LA.
24. Zhao H, **Weltzin M**, Bucci D, Drew KL. Effects of hibernation on retention of an active avoidance task. Society for Neuroscience, November 2-7, 2002, Orlando, Florida.

Regional Abstracts *(* Corresponding author; ** UAF graduate student author; *** UAF undergraduate student author)*

1. O'Brien BCV**, Weber L**, **Weltzin MM***. Design and optimization of nicotinic acetylcholine receptor subtype selective peptides. Alaska IDeA Network of Biomedical Research Excellence retreat. September 2023, Talkeetna, AK
2. Suarez S**, Danielson H***, **Weltzin MM*.** VILIP-1 modulates nicotinic receptor subtypes*.* Alaska IDeA Network of Biomedical Research Excellence retreat. September 2023, Talkeetna, AK
3. Suarez S**, Danielson H***, **Weltzin MM*.** VILIP-1 modulates nicotinic receptor subtypes*.* Society for Neuroscience 2022. San Diego, CA. November 2022
4. Suarez S**, Danielson H*, **Weltzin MM*.** SHE-Associated Mutation and Its Effects On nAChR Receptor Isoform Expression. Alaska IDeA Network of Biomedical Research Excellence retreat. October 1 – 2, 2021. Virtual.
5. Smith T**, McKay J***, **Weltzin MM*.** An Examination of a Sleep-Related Hypermotor Epilepsy (SHE) Associated Mutation in Subtypes of Nicotinic Acetylcholine Receptors. Alaska IDeA Network of Biomedical Research Excellence retreat. October 1 – 2, 2021. Virtual.
6. McKay J***, Wackerbauer R, and **Weltzin MM*.** Computational Modeling of Wild-type and Sleep Related Hypermotor Epilepsy Associated Nicotinic Acetylcholine Receptors Using Single-Channel Patch Clamp Electrophysiology Data. Alaska IDeA Network of Biomedical Research Excellence retreat. October 1 – 2, 2021. Virtual.
7. Thao S***, Spain C***, Hueffer K, and **Weltzin MM***. The Study of a Derived Dog Rabies Virus Glycoprotein Peptide's Interactions with Nicotinic Acetylcholine Receptors. Alaska IDeA Network of Biomedical Research Excellence retreat. September 21 – 23, 2019, Talkeetna, AK.
8. McKay J***, Smith T**, and **Weltzin MM***. An Examination of Nocturnal Frontal Lobe Epilepsy Associated Mutations in Subtypes of Neuronal Nicotinic Acetylcholine Receptors. Alaska IDeA Network of Biomedical Research Excellence retreat. September 21 – 23, 2019, Talkeetna, AK.
9. Thao S***, Spain C***, Hueffer K, and **Weltzin MM***. The Study of a Derived Dog Rabies Virus Glycoprotein Peptide's Interactions with Nicotinic Acetylcholine Receptors. One Health Research Conference of Alaska. May 15 – 17, 2019, Fairbanks, AK.
10. McKay J***, Smith T**, and **Weltzin MM***. An Examination of Nocturnal Frontal Lobe Epilepsy Associated Mutations in Subtypes of Neuronal Nicotinic Acetylcholine Receptors. One Health Research Conference of Alaska. May 15 – 17, 2019, Fairbanks, AK.
11. Spain C***, Hueffer K, and **Weltzin MM***. Rabies glycoprotein interacts with neuronal nicotinic acetylcholine receptors in a subtype-selective manner. Alaska IDeA Network of Biomedical Research Excellence retreat. September 5 - 7 2018, Talkeetna, AK.
12. **Weltzin M**, Padnya A, Edmonds BW, Schulte MK. Characterizing a positive allosteric modulator binding site on α4β2 neuronal nicotinic receptors. University of Alaska Biomedical Research Conference, May 2008, Anchorage, AK.
13. Zhao H, **Weltzin M**, Bucci D, Drew KL, Effects of hibernation on retention of an active avoidance task. AAAS 53rd Arctic Science Conference, September 18-21, 2002, Fairbanks, Alaska.
14. Zhao H, **Weltzin M**, Drew KL, Effects of hibernation on retention of an active avoidance task. Alaskan Summer Neuroscience Conference, July 14-15, 2002, Fairbanks, AK

PRESENTATIONS

Professional Seminar Presentations

1. "Developing Cell Penetrating Peptides For Drug Delivery Using Viral Glycoproteins" Department of Chemistry and Biochemistry seminar, University of Alaska Fairbanks, Fairbanks, AK April 2023.
2. "Sleep-related Hypermotor Epilepsy-Associated Mutation Disrupts Native Modulator VILIP-1 Interactions With α4β2 Nicotinic Receptors" 2021 ACS Northwest Regional Meeting, virtual May 2021.
3. "Sleep-related Hypermotor Epilepsy-Associated Mutation Disrupts Native Modulator VILIP-1 Interactions With α4β2 Nicotinic Receptors" Alaska IDeA Network of Biomedical Research Excellence, virtual October 2020.
4. "Examination of a Nocturnal Frontal Lobe Epilepsy Associated Mutation in Subtypes of Neuronal Cholinergic Receptors" Alaska IDeA Network of Biomedical Research Excellence (INBRE), Talkeetna, AK September 2019.
5. "Nicotinic Acetylcholine Receptor Interactions with the Rabies Glycoprotein" Department of Chemistry and Biochemistry seminar, University of Alaska Fairbanks, Fairbanks, AK October 2018.
6. "Investigation of Nicotinic Acetylcholine Receptors (nAChRs) in Neurological and Immunological Disorders" University of Fairbanks Alaska, Fairbanks, AK May 2017.
7. "Nicotine Addition Snapshot: Neuronal Mechanisms, Devices of Tobacco Use, Society Burden and Resources" Alaska Tobacco Control Alliance, Anchorage, AK April 2017.
8. "Nicotine Addition Snapshot: Neuronal Mechanisms, Devices of Tobacco Use, Society Burden and Resources" All-Alaska Medical Conference, Fairbanks, AK October 2016.
9. "Investigation of Novel Nicotinic Receptor Mutations Associated With Nocturnal Frontal Lobe Epilepsy" The Barrow Neurological Institute, Phoenix, AZ July 2015.
10. "A Single-Channel Investigation of Mutated nAChRs Implicated in Nocturnal Frontal Lobe Epilepsy" Lightning Talk nAChR 2014, Cambridge, UK, July 2014.
11. "Investigation of the Allosteric Modulator Desformylflustrabromine Interactions on Nicotinic Acetylcholine Receptors" University of Montana, Jan 2012.
12. "Investigation of the Allosteric Modulators Desformylflustrabromine and 4-(2-Hydroxyethyl)-1-piperazineethanesulfonic Acid (HEPES) Interactions on Nicotinic Acetylcholine Receptors" PhD Thesis Defense, University of Alaska Fairbanks, July 2011.

National and International Poster Presentations *(* Corresponding author; ** UAF graduate student author; *** UAF undergraduate student author)*

- O'Brien BCV**, Weber L**, **Weltzin MM***. Design and optimization of nicotinic acetylcholine receptor subtype selective peptides. Biophysical Society annual meeting 2023. San Diego CA. February 2023.
- Weber L**, O'Brien BCV**, **Weltzin MM***. Cytotoxicity and internalization properties of novel alpha7 nicotinic receptor selective peptides. Biophysical Society annual meeting 2023. San Diego CA. February 2023.
- Suarez S**, Danielson H***, **Weltzin MM*.** VILIP-1 modulates nicotinic receptor subtypes**.** Society for Neuroscience 2022. San Diego, CA. November 2022
- O'Brien BCV** and **Weltzin MM***. Nicotine enhances SARS-CoV-2 glycoprotein functional modulation of the alpha7 nicotinic acetylcholine receptor. Virtual. November 2021.
- **Weltzin MM***, Danielson H***, Suarez S**. Sleep-related Hypermotor Epilepsy-Associated Mutation Disrupts Native Modulator VILIP-1 Interactions With α4β2 Nicotinic Receptors. 2021 ACS Northwest Regional Meeting. Virtual. May 2021.
- Suarez S**, Danielson H***, **Weltzin MM***. Epilepsy Associated Mutation Disrupts VILIP-1 Modulation of Nicotine Receptors. American Association for the Advancement of Science (AAAS) Annual Meeting. Virtual. February 2021.
- McKay J***, Smith T**, and **Weltzin MM***. Examination of a Nocturnal Frontal Lobe Epilepsy

Associated Mutation in Subtypes of Neuronal Cholinergic Receptors. Neuroscience 2019. Chicago, IL. October 2019.

- Thao S***, Spain C***, Hueffer K and **Weltzin MM***. Nicotinic Acetylcholine Receptor Interactions with the Rabies Glycoprotein. Neuroscience 2019. Chicago, IL. October 2019.
- **Weltzin MM**, George AA, Lukas RJ and Whiteaker P. Occupation of the alpha4(+)/alpha4(-) subunit interface enhances function of the low sensitivity alpha4beta2nicotinic acetylcholine receptor isoform by destabilization of receptor closed states. Neuroscience 2016. San Diego. October 2016.
- **Weltzin MM**, George AA, Lukas RJ and Whiteaker P. A Single-Channel Investigation of Mutated nAChRs Implicated in Nocturnal Frontal Lobe Epilepsy. nAChR Satellite Conference 2015. Chicago, IL, October 2015.
- **Weltzin MM**, Purohit P, George A, Lukas RJ and Whiteaker P. A Single-Channel Investigation of Mutated nAChRs Implicated in Nocturnal Frontal Lobe Epilepsy. nAChR 2014. Cambridge, UK, July 2014.
- **Weltzin MM**, Wu J, Lukas RJ and Whiteaker P. Effects of novel nocturnal frontal lobe epilepsy-associated nicotinic acetylcholine receptor mutations. Neuroscience 2013. San Diego, CA, November 2013.
- **Weltzin MM**, Eaton JB, Lukas RJ, McIntosh JM and Paul Whiteaker. Evaluation of α-conotoxins on α6/α3β2β3 and α3β2 nAChRs. Neuroscience 2011. New Orleans, LA, October 2011.
- **Weltzin MM** and Schulte MK . Allosteric modulation of high and low affinity alpha4beta2 nicotinic acetylcholine receptors by HEPES. Neuroscience 2010. San Diego, CA, November 2010.
- **Weltzin MM** and Schulte MK. Investigating allosteric potentiation of the alpha4beta2 neuronal nicotinic acetyl choline receptor stoichiometries. Neuroscience 2009. Chicago, IL, November 2009.
- **Weltzin MM** and Schulte MK. Mechanisms of des-formylflustrabromide potentiation of neuronal $\alpha_4\beta_2$ nicotinic acetyl choline receptors. Neuroscience 2008. Conference Washington DC, November 2008.
- **Weltzin MM** and Schulte MK. Mechanisms of potentiation by des-formylflustrabromide of neuronal nicotinic acetylcholine Receptors. IDeA National Symposium. Washington DC, August 2008.

Regional Poster Presentations *(* Corresponding author; ** UAF graduate student author; *** UAF undergraduate student author)*

1. O'Brien BCV**, Weber L**, **Weltzin MM***. Design and optimization of nicotinic acetylcholine receptor subtype selective peptides. Alaska IDeA Network of Biomedical Research Excellence retreat. September 2023, Talkeetna, AK
2. Suarez S**, Danielson H***, **Weltzin MM*.** VILIP-1 modulates nicotinic receptor subtypes*.*
3. Alaska IDeA Network of Biomedical Research Excellence retreat. September 2023, Talkeetna, AK
4. Suarez S**, Danielson H*, **Weltzin MM*.** SHE-Associated Mutation and Its Effects On nAChR Receptor Isoform Expression. Alaska IDeA Network of Biomedical Research Excellence retreat. October 1 – 2, 2021. Virtual.
5. Smith T**, McKay J***, **Weltzin MM*.** An Examination of a Sleep-Related Hypermotor Epilepsy (SHE) Associated Mutation in Subtypes of Nicotinic Acetylcholine Receptors. Alaska IDeA Network of Biomedical Research Excellence retreat. October 1 – 2, 2021. Virtual.
6. McKay J***, Wackerbauer R, and **Weltzin MM*.** Computational Modeling of Wild-type and Sleep Related Hypermotor Epilepsy Associated Nicotinic Acetylcholine Receptors Using Single-Channel Patch Clamp Electrophysiology Data. Alaska IDeA Network of Biomedical Research Excellence retreat. October 1 – 2, 2021. Virtual.
7. Thao S***, Spain C***, Hueffer K, and **Weltzin MM***. The Study of a Derived Dog Rabies Virus Glycoprotein Peptide's Interactions with Nicotinic Acetylcholine Receptors. INBRE retreat.

September 21 - 23, 2019, Talkeetna, AK.

8. McKay J***, Smith T**, and **Weltzin MM***. An Examination of Nocturnal Frontal Lobe Epilepsy Associated Mutations in Subtypes of Neuronal Nicotinic Acetylcholine Receptors. INBRE retreat. September 21 - 23, 2019, Talkeetna, AK.
9. Thao S***, Spain C***, Hueffer K, and **Weltzin MM***. The Study of a Derived Dog Rabies Virus Glycoprotein Peptide's Interactions with Nicotinic Acetylcholine Receptors. One Health Research Conference of Alaska. May 15 - 17, 2019, Fairbanks, AK.
10. McKay J***, Smith T**, and **Weltzin MM***. An Examination of Nocturnal Frontal Lobe Epilepsy Associated Mutations in Subtypes of Neuronal Nicotinic Acetylcholine Receptors. One Health Research Conference of Alaska. May 15 - 17, 2019, Fairbanks, AK.
11. Thao S***, Spain C***, Hueffer K., and **Weltzin MM***. The Study of a Derived Dog Rabies Virus Glycoprotein Peptide's Interactions with Nicotinic Acetylcholine Receptors. UAF Creative Activity and Research Day. April 19, 2019, Fairbanks, AK.
12. McKay J***, Smith T**, and **Weltzin MM***. An Examination of Nocturnal Frontal Lobe Epilepsy Associated Mutations in Subtypes of Neuronal Nicotinic Acetylcholine Receptors. UAF Creative Activity and Research Day. April 19, 2019, Fairbanks, AK.
13. Spain C***, Hueffer K, and **Weltzin MM***. Rabies glycoprotein interacts with neuronal nicotinic acetylcholine receptors in a subtype-selective manner. INBRE retreat. September 5 - 7 2018, Talkeetna, AK.
14. Geick, P*** and **Weltzin MM***. Construction of wildtype and epilepsy-associated mutant human nicotinic acetylcholine receptor subunit cRNAs. UAF Creative Activity and Research Day. April 2018, Fairbanks, AK.
15. **Weltzin MM** and Schulte MK. Characterization of the des-formylflustrabromide binding site of α4β2 neuronal nicotinic acetylcholine receptors. University of Alaska Biomedical Research conference, Fairbanks, AK, May 2007.

PATENTS FILED

1. Weltzin MM. SARS CoV2 COMPOSITIONS AND METHODS OF USE. Provisional Patent, United States Patent Office, file March 13, 2023.
2. Weltzin MM. RABIES VIRAL GLYCOPROTEIN COMPOSITIONS AND METHODS OF USE. Provisional Patent, United States Patent Office, file January 27, 2023.

NEWS REPORTS

1. https://www.drugdiscoverynews.com/better-rabies-treatments-bite-back-15617

TEACHING EXPERIENCE

- **Instructor for Chemistry, Biochemistry, and Neuroscience Courses,** Department of Chemistry and Biochemistry, University of Alaska Fairbanks, July 2017-current.
  Courses designed and taught:
  CHEM F104X: Survey of Organic Chemistry and Biochemistry (with lab, 4 credit hrs)
  CHEM F104UX: Survey of Organic Chemistry and Biochemistry (distance delivery course and lab, 4 credit hrs)
  CHEM F105X: General Chemistry I (with lab, 4 credit hrs)
  CHEM 450: Information Storage and Transfer (Biochemistry 1) (3 credit hrs)
  CHEM 450 UX: Information Storage and Transfer (Biochemistry 1) (distance delivery, 3 credit hrs)
  BIOLF679/CHEM 460/670: Cellular and Molecular Neuroscience (3 credit hrs)
  CHEM 654: Protein Structure and Function (3 credit hrs)
  CHEM 654X: Protein Structure and Function (distance delivery, 3 credit hrs)
  CHEM 697: Independent Seminar (2 credit hrs)

- **Neurochemistry Guest Lecture**, Department of Chemistry and Biochemistry, University of

Alaska Fairbanks, November 2016.

- **Neuroscience Guest Lecturer**, Department of Biomedical Sciences, Midwestern University, March - April 2014.
- **Neuroscience Guest Lecturer**, Department of Biomedical Sciences, Midwestern University, April 2013.
- **Biochemistry Guest Lecturer**, Department of Chemistry, University of Alaska Fairbanks, May 2013.
- **Substitute Teacher**, Fairbanks North Star Borough School District, September - December 2011. Taught students in K-12 grades.
- **Graduate Teaching Assistant**, UAF Department of Chemistry, January - May 2007
  Taught undergraduate Chem 105 chemistry laboratory courses. Responsibilities included preparing the laboratory, lecture, one-on-one student help and grading.

- **Student Advising**

Student	Date	Current Position or Degree Earned
	Graduate Students	
Lahra Weber	Aug 2021 - current	Graduate Student (MS)
Brittany O'Brien	Aug 2020 - current	Graduate Student (PhD)
Sarah Suarez	Aug 2019 - current	Graduate Student (PhD)
Tyler Smith	Aug 2018 - 2022	MS
Viktorija Podlutskaya	Dec 2020 – Aug 2022	MS
	Undergraduate Students	
Aggy Boldt	March 2023- current	Undergraduate Student
Gabriel Miller	March 2023- current	Undergraduate Student
Racheal Ware	May - August 2022	Undergraduate Student
Joey Harun-Delong	May - August 2021	Undergraduate Student
James McKay	October 2017- June 2021	B.S.
Helen Danielson	May 2019 - Fall 2020	Undergraduate Student
Bryant Griffith	January 2020 - July 2021	B.S., Medical School
Shane Bennett	January 2020 - July 2020	Undergraduate Student
Shelly Thao	February 2018 - May 2020	B.S.
Chanta Spain	October 2017 - Dec 2018	B.S.
Paige Gieck	Aug 2017 - May 2018	B.S.
Allison Baker	June 2015 - July 2016	PhD
Alex Hailey	Jan 2014 - Aug 2014	M.D.
Abi Bloy	Aug 2012 - Aug 2013	Post-doctoral fellow
Rob Ellingford	Aug 2012 - Aug 2013	Post-doctoral fellow
Stephen Wall	Aug 2010 - Aug 2011	B.S.
Kelsi Evans	May 2009 - Aug 2009	B.S., M.D.
Dawn Holt	May 2009 - Dec 2009	B.S., PharmD
Brittany Karns	Jan 2007 - Dec 2007	B.S., PharmD
Shoshana Wilson	Aug 2006 - Dec 2006	B.S.
	High School Students	
Lauren White	June 2019 – Aug 2019	High School
Kelsi Evans	Aug 2003 – May 2004	Medical School
	Technicians	
Brittany O'Brien	Jan 2019 – Aug 2020	PhD Graduate Student
Dr. Yilong Ma	Aug 2009 – Aug 2010	Retired
	Fellow Peer Graduate Students	
Yanzhou Huang	Aug 2010 – Aug 2011	Ph.D., Post-doctoral fellow
Bjorg Edberg	Jan 2008 – May 2008	Ph.D.
Yeganeh Ataian	Jan 2008 – May 2008	Ph.D.
Anshul Pandya	Jan 2006 – Dec 2007	Ph.D., Assistant Professor

Graduate Student Committees

2023 - current	Thesis Committee, Committee member, Vy Nguyen, Biochemistry and Molecular Biology, UAF (MS)
2023 - current	Thesis Committee, Committee member, Leilani Megliola, Biochemistry and Molecular Biology, UAF (MS)
2022 - 2023	Thesis Committee, Committee member, Zixuan Yan, Pharmaceutical Sciences with specialization in Pharmacology, Northeastern University (MS)
2021 - current	Thesis Committee, **Chair**, Lahra Weber, Biochemistry and Molecular Biology, UAF (MS)
2020 - 2022	Thesis Committee, **Chair**, Viktorija Podlutskaya, Biochemistry and Molecular Biology, UAF (MS)
2020 - current	Thesis Committee, **Chair**, Brittany O'Brien, Biochemistry and Molecular Biology, UAF (Ph.D)
2019 - current	Thesis Committee, **Chair**, Sarah Suarez, Biochemistry and Molecular Biology, UAF (Ph.D)
2018 - 2022	Thesis Committee, **Chair**, Tyler Smith, Biochemistry and Molecular Biology, UAF (M.S.)
2019 - current	Thesis Committee, Committee member, Moriah Hunstiger, Biochemistry and Molecular Biology, UAF (Ph.D)
2018 - 2020	Thesis Committee, Committee member, Viktorija Podlutskaya, Biochemistry and Molecular Biology, UAF (M.S.)
2018 - current	Thesis Committee, Committee member, Bernard Laughlin, Biochemistry and Molecular Biology, UAF (Ph.D)
2017 - 2022	Thesis Committee, Committee member, Jishnu Krishnan, Biochemistry and Molecular Biology, UAF (Ph.D)

PROFESSIONAL DEVELOPMENT

- NCURA webinar on NSF and NIH C&P/Other Support updates, virtual, April 2023
- UAF Promotion, Tenure, and Career Success Workshop, UAF, April 2023
- UAF Proposal Development Workshop, UAF, April 2022
- ACS invited talk, May 2021
- UAF Proposal Development Workshop, UAF, April 2021
- NSF CAREER Panel Webinar/Workshop, UAF, March 2021
- NSF CAREER Panel with UAF Awardees, UAF, March 2021
- Clinical Trial Training Seminar Series, UAF, February 2021
- UAF 16th Annual Promotion, Tenure, and Career Success Workshop, UAF, April 2021
- Pathways to Success (ways to successful navigated the tenure and evaluation process), UAF, April 2021
- Accelerated Master's Town Hall, UAF, March 2021
- Chairing Graduate Committees- Principles and Practices, UAF, November 2020.
- Invited talk, INBRE, October 2021
- Graduate student mentoring workshop, UAF, April 2020
- Best practices for developing online STEM course, Fairbanks, AK Spring 2019
- Attended "Neuroscience 2019" conference, San Diego, CA, October 2019
- Small business innovation research grant application webinar, Fairbanks, AK August 2019
- NIH grant writing workshop, Experimental Biology, Orlando, FL, April 2019
- Attended "Experimental Biology" conference, Orlando, FL, April 2019
- Gradescope webinar, UAF, January 2019
- Pedagogy workshop, University of Alaska Fairbanks, Fairbanks, AK, October 2018
- Responsible Conduct of Research, University of Alaska Fairbanks, Fairbanks, AK, September

2018
- Dealing with difficult students workshop, UAF, October 2017
- Received training in single channel patch clamp analysis software QuB in Dr. Anthony Auerbach's Lab, University of Buffalo, Buffalo, NY, October 3 - 11, 2013
- Attended "Nicotinic Acetylcholine Receptor 2008" conference, Hinxton, England, April 2008

HONORS
- UNAC travel award, January 2023
- Alaska INBRE travel award, August 2022
- BLaST Scientist of the Month, October 2020
- Nominated for the Robert Piacenza Excellence in Teaching Award, Spring 2020
- Alaska INBRE travel award, October 2019
- Alaska BLaST travel award, July 2019
- Alaska INBRE developmental research core exceptional request travel award, March 2019
- Undergraduate student won "Best undergraduate poster presentation" INBRE retreat Talkeetna, AK, September 2018
- Alaska INBRE travel award, August 2018

ACADEMIC SERVICE
- Student academic advisor for the accelerated Chemistry and Biochemistry BS/MS program 2022 – current.
- UAF Academic Disqualification Appeal Committee, faculty member, UAF, Spring 2021 - current
- Championed development of the Chemistry and Biochemistry accelerated BS/MS program, UAF, Spring 2021 – Summer 2021
- Updating imaging facilities, UAF, 2020- current
- Student recruitment for undergraduate and graduate programs, UAF, 2017 - current
- Annual participation in community K-12 outreach "Science Potpourri", UAF 2017 - 2019
- Annual participation in Careers of Science & Math Opportunity Summit (COSMOS), UAF, 2018 - 2019
- General chemistry curriculum review committee September 2017 - May 2018
- Grant review for colleagues 2017 -current
- Grant review for students 2017 -current
- Member of the Barrow Neurological Institute Neuroscience Seminar speaker committee, December 2014 - July 2016
- Member of the Alaska Native Science and Engineering Program (ANSEP), September 2010 - 2011

PROFESSIONAL SERVICE
- Review Editor, Editorial Board of Neuropharmacology, *Frontiers in Pharmacology,* May 2023-current
- Guest Editor for *Molecules* 2022- current
- *Ad hoc* manuscript reviewer for *ACS Chemical Neuroscience 2022*
- Ad hoc external reviewer for *Frontiers in Cell and Developmental Biology, section Signaling,* Su 2021
- Reviewed Graduate student INBRE research fellowship applications. UAF, Sp 2021
- Student poster judge at Alaska INBRE retreat. October 2020
- External reviewer for Experimental Neurology (two manuscripts), Sp and Su 2020
- Reviewed Graduate student INBRE research fellowship applications. UAF, Sp 2020
- Student poster judge at Alaska INBRE retreat. October 2019
- Student poster judge at Alaska INBRE retreat. September 2018

- Reviewed Graduate student INBRE research fellowship applications. UAF, Sp 2019
- Guest lecture for CHEM 105. UAF Fa 2017
- Grand Judge volunteer at the Intel International Science and Engineering Fair, Phoenix, AZ, May 8 – 13, 2016
- Volunteer showcasing the laboratory research and techniques to high school students, Phoenix, AZ, November 2015

PUBLIC SERVICE

- Fairbanks North Star Borough Air Pollution Control Commissioner, Fairbanks, AK 2017 – current

PROFESSIONAL MEMBERSHIPS

- Biophysical Society, 2022 - current
- Society for Neuroscience, 2008 - current