

Sue A. Aicher, Ph.D.

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Business Address: Oregon Health & Science University
Department of Chemical Physiology & Biochemistry
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Education: 1985 Bachelor of Science with High Honors
New Mexico Institute of Mining and Technology
Socorro, New Mexico

1989 Ph.D. in Psychology
The University of Iowa
Iowa City, Iowa
Thesis title: Involvement of vagal afferents and the caudal medulla in the modulation of a nociceptive reflex in the rat, Advisor: Alan Randich

Professional Employment:

The University of Iowa
Psychology Department
Iowa City, IA
Research Assistant, 1985-1989

Cornell University Medical College
Department of Neurology & Neuroscience
New York, NY
Postdoctoral Associate, 1989-1993
Instructor, 1993-1995
Assistant Professor, 1995-2000

Oregon Health & Science University
Neurological Sciences Institute (*closed in 2008*)
Associate Scientist, 2000-2007
Senior Scientist, 2007-2008

Research Development and Administration
Director, University Shared Resources Program, 2007-2010
Director, Shared Instrumentation Program, 2010-2020

Department of Physiology and Pharmacology
(*renamed Chemical Physiology & Biochemistry, July 2019*)
Adjunct Associate Professor, 2000-2008
Professor, 2008-present (tenure granted 2015)

Active Grant Support:

National Heart, Lung and Blood Institute, R01 HL46833 “Peripheral sympathetic dysfunction in cardiac disease” (Habecker, PI); Role: co-I, 2020-2024

National Eye Institute R61 EY032468 “Tear protein biomarkers of refractive surgery pain” Role: PI, 2020 - 2022

National Institute of Mental Health, R01 MH127343 “Strategy to map electrical synaptic connectivity in neural networks” (Ribelayga, PI) Role: co-PI, 2021-2024

Department of Defense, “Mechanisms underlying severe chronic pain in Schwannomatosis” (Matsumoto, PI) Role: co-I, 2021-2024

Completed Grant Support:

University of Iowa, NIH Neuroscience Graduate Training Fellowship, 1987-1989
 United States Public Health Service National Research Service Award, 1990-1993
 American Heart Association (National Chapter) Grant-in-Aid, 1994-1996
 American Heart Association (National Chapter) Established Investigator Award, 1997-2001
 National Heart, Lung and Blood Institute PPG grant (D. Reis, P.I.), co-leader of section 4, 1997-2000
 Murdock Charitable Trust, Instrumentation Grant (TEM facility), 2003
 Medical Research Foundation of Oregon, Seed Grant, 2003-2004
 National Heart, Lung and Blood Institute R01 grant (HL56301), Role: P.I., 1997-2009
 National Inst. Neurological Disorders & Stroke R01 grant (NS063010, M. Gold), Role: subcontract, 2009-2012
 National Institute on Drug Abuse R01 grant (DA027625, Aicher, Ingram, Morgan); Role: co-P.I., 2009-2014
 National Institute of Dental and Craniofacial Research R01 grant (DE12640), Role: P.I., 1999-2014
 OHSU Presidential Bridge Funding, 2015-2016
 Medical Research Foundation of Oregon, 2016-2017
 National Eye Institute, R41 grant (EY030804 “Resveratrol as a corneal pain therapeutic”) Role: P.I., 2019-2021
 National Institute on Drug Abuse, R01 grant (DA040965, Sorg, Brown, Aicher); Role: co-I, 2016-2022
 National Institute of Neurological Disorders & Stroke, P30 grant (NS061800), Role: P.I. and Director, 2009-2022

Consultant for the following Grants:

Nathan R. Selden (P.I.)	NIH, K08 NS 0044255	2002 – 2007
Catherine W. Morgans (P.I.)	NIH, R03 EY 016078	2005 – 2007
Jacob Raber (P.I.)	NIH, R01 MH 077647	2007 – 2012
Alan Randich (P.I.)	NIH, R01 DK 073218	2007 – 2010
Elena Bagley (P.I.)	Australia Research Council	2012 – 2014
Vivek Unni (P.I.)	NIH, K02 NS096190	2016 – 2021

Grant review for (*chair):

The Wellcome Trust (U.K.); National Science Foundation; Multiple Sclerosis Society of Canada
 NIH: Experimental & Cardiovascular Sciences, ad hoc reviewer, 2000
 Somatosensory & Chemosensory Study Section, Special Emphasis Panel, 2002, 2004, 2005, 2006
 Sensorimotor Integration Study Section, Special Emphasis Panel (SEP), 2004, 2013, 2014 *
 Chronic Fatigue Syndrome, Fibromyalgia Syndrome, Temporomandibular Dysfunction, SEP, 2007
 Shared Instrumentation Study Section (S10 panel) for light microscopy, 2002 – 2007, 2013, 2015, 2018
 Shared Instrumentation Study Section (S10 panel) for electron microscopy, 2015, 2016 *
 Somatosensory & Chemosensory Systems Study Section, permanent member, 2007 – 2011
 NIDCR Institutional Training for Dental and Craniofacial Workforce grants, 2011
 NHLBI Special Emphasis Panel, 2013, 2015
 NIDCR DSR Panel, 2013; Special Emphasis Panel, 2014
 VA RRDA Panel on Spinal cord injury & neuropathic pain, 2018
 Department of Defense review panel, 2018
 National Eye Institute, Special Emphasis Panel, 2021
 NIH COBRE grants, 2021
 Other NIH Service:
 NEI ocular pain workgroup 2010
 NEI Strategic Planning Panel, Biology & Neuroscience of Vision, 2020

Professional Organizations:

American Physiological Society (APS); Association for Research in Vision and Ophthalmology (ARVO); International Association for the Study of Pain (IASP); Microscopy Society of America; Society for Neuroscience (SFN); US Association for the Study of Pain (USASP)

Manuscript review for: *American Journal of Physiology; Anesthesia & Analgesia; Brain Research; Brain Research Bulletin; Cellular & Molecular Neurobiology; Cerebral Cortex; Experimental Eye Research; Experimental Neurology; Experimental Physiology; European J Neuroscience; European J Pain; Frontiers in Molecular Neuroscience; Frontiers in Pharmacology; Frontiers in Medicine; Frontiers in Molecular Neuroscience; Headache; Hypertension; Investigative Ophthalmology & Visual Science; J Cerebral Blood Flow and Metabolism; J Chemical Neuroanatomy; J Comparative Neurology; J Dental Research; J Autonomic Nervous System; J Neuroscience; J Neurocytology; J Neurophysiology; J Pharm. & Experimental Therapeutics; J Physiol.; Neurobiology of Learning & Memory; Neuropharmacology; Neuroscience; Neuroscience Letters; Pain; Pain Reports; Peptides; Pharmacology, Biochemistry & Behavior; PLOS ONE; Proceedings of the National Academy of Sciences (PNAS); Synapse; Violence Against Women*

Editorial Board: Journal of Chemical Neuroanatomy, 2011-present
Journal of Comparative Neurology, 2016-present

Invited Research Presentations:

Erasmus University, Rotterdam Anatomy Department	July 1993	Reticulospinal projections from a vasodepressor area in the gigantocellular reticular formation of the rat
University of Utah Pharmacology & Toxicology	May 1996	Brainstem regulation of cardiovascular function
Experimental Biology Symposium	April 1998	Synaptic connectivity of the medullary baroreflex arc as determined by neuroanatomy
Oregon Health Sciences University Physiology & Pharmacology	December 1998	Brain stem pathways that regulate sympathetic outflow
Cornell University Medical College Progress in Neuroscience series	February 1999	Synaptic regulation of autonomic pathways in the brainstem and spinal cord
Oregon Health & Sci.Univ. Neurological Sciences Institute Portland, OR	March 1999	Receptor localization on dorsal horn nociceptive neurons
Baroreceptor & Cardiopulmonary Receptor Reflexes Conference Iowa City, IA	August 2000	Ultrastructural studies of baroreceptive neurons
Dalton Cardiovascular Research Ctr. University of Missouri Columbia, MO	January 2001	Heterogenous distribution of receptors on autonomic neurons
Oregon Health & Sci.Univ. Neurological Sciences Institute Beaverton, OR	January 2002	AMPA receptor plasticity in autonomic neurons induced by hypertension

Invited Research Presentations (continued):

Washington State University, Psychology Dept., Vancouver, WA	October 2002	Anatomical studies of trigeminal pain pathways
University of Sydney Sydney, Australia	August 2005	Hypertension-induced synaptic plasticity in the nuclei of the solitary tract
George Washington University Pharmacology Dept. Washington, DC	September 2005	Brainstem distribution of mu-opioid receptors
Temple University Ctr. for Substance Abuse Research Philadelphia, PA	September 2005	Opioid receptor distribution in rat brainstem: It's MOR complicated than you think
Drexel University Pharmacology Dept. Philadelphia, PA	September 2005	Localization of mu-opioid receptors in pain and autonomic pathways
University of Pittsburgh Center for Pain Research Pittsburgh, PA	February 2007	An anatomist's guide to trigeminal pain pathways
Mayo Clinic Rochester, MN	May 2008	Anatomical substrates for the mediation and modulation of trigeminal pain
International Narcotics Research Conference Portland, OR	July 2009	Descending pathways from periaqueductal gray to rostral ventromedial medulla to spinal cord: Is there neurochemical and functional specificity?
University of Minnesota Neuroscience Dept	February 2010	Trigeminal pain: Ascending and descending pathways
OHSU Anesthesiology Dept.	March 2010	Opioids and pain pathways
West Virginia University Center for Neuroscience	January 2011	Opioid and dopaminergic pain modulation in the periaqueductal gray
OHSU Pain Day	February 2012	Pain pathways from cornea to brain: Neurochemistry and central targets
Washington State Univ. Neuroscience Program	January 2013	Pain afferents from the cornea: A unique view from the eye
OHSU Biomedical Engineering	March 2013	Microscopic resolution in neuroscience: From systems to the subcellular
University of Arizona Pharmacology Department	April 2016	Role of corneal nerve fibers in pain and disease

Invited Research Presentations (continued):

Microscopy & Microanalysis Portland, OR	August 2019	Quantitative anatomical approaches to examining plasticity in neural circuits
George Washington University Neuroscience Institute Washington, DC	October 2019	Pain and dry eye after corneal nerve injury
American Medical Women's Association Conference Portland, OR	December 2019	Building resilience through trauma-informed yoga

Teaching and Training Activities:

Course Instructor, *General Psychology*, Department of Psychology, University of Iowa, 1987
 Lecturer, *Chemical Neuroanatomy*, Dept. Neurology & Neurosci., Cornell Univ. Medical College, 1992 -1996
 Journal Club Leader, *Brain and Mind*, 2nd Year Medical School Course, Cornell Univ. Med. Coll., 1997 - 2000
 Lecturer, *Peptides and Pain*, Department of Pharmacology, Cornell University Medical College, 1997 - 2000
 Lecturer, *Neural Science I*, Center for Neural Science, New York University, 1997
 Lecturer, *Cellular & Molecular Neuroscience*, Graduate School Course, Cornell, Weill Med. Coll. 1999 - 2000
 Lecturer, *Neuroanatomy*, Neuroscience Graduate Program, Oregon Health & Science University, 2001 - 2006
 Lecturer, *Systems Processes & Homeostasis*, 1st Year Medical School, Oregon Health & Science Univ, 2008
 Lecturer, *Neural Substrates of Addiction*, Graduate School Course, Oregon Health & Sci Univ, 2010 - 2016
 Lecturer, *Neurophysiology and Pharmacology of Pain*, Graduate School Course, OHSU 2013 - present
 Discussion Group Leader, *The Practice and Ethics of Science*, required graduate course, OHSU, 2009 – present
 Lecturer, *Respiratory Physiology*, required course Physician Asst Program, OHSU, 2016 - 2018
 Lecturer, *Pain Intersession*, required Medical School Course, OHSU, 2016 - present
 Instructor, *Neuroanatomy*, required Medical School Course, OHSU, 2017 - present
 Assistant Director & Search Committee Member, Integrative Biomedical Sciences Graduate Training Program,
 Oregon Health & Science University, 2001 – 2003 (training program restructured)
 Faculty Member, Neuroscience Graduate Program, Oregon Health & Science University, 2001 – present
 Faculty Member, Program in Molecular and Cellular Biology, 2008 – 2019 (program redesigned in 2019)
 Faculty Member, Program in Biomedical Sciences, 2019 - present

Ph.D. Qualifying Exam Member for: Diana Parrish (2011); Qi Liang Chen (2013); Kayly Lembke (2013); Gabriel Romero (2016)

Ph.D. thesis committee member for: Mark Doyle (2001); Brenda McKee (2006); Christina Lorentz (2010); Ryan Gardner (2014); Kayly Lembke (2017); James Goodman (2019); Gabriel Romero (2021)

Summer Research Trainees (name, trainee institution at the time of training, year of training):

Bernard Chang* (New York University, 1995); **Geneviene Yuen*** (Yale, 1997); **Ann Punnoose*** (Candozo High School, 1999); **Theresa Zhou*** (Steyvesant High School, 2000); **Patrick Lynch*** (University of Georgia, 2001); **Tiffany Henderson** (Linfield College, 2001); **Tera Cushman*** (University of St. Andrews, 2002, 2003); **Clayton Winkler*** (Lewis & Clark College, 2003); **James F. Colbert*** (University of Iowa, 2004); **Leopold Arko*** (New Mexico Tech, 2004); **Karen Tonsfeldt*** (Oregon State University, 2006); **Helen Helfand** (St. Mary's Academy High School, 2006); **Emily Deichsel*** (Lewis & Clark College, 2007, 2008) **Margaret Dowling** (Lewis & Clark College, 2010); **Katherine Yang** (Westview High School, 2015); **Aveek Ganguly** (Westview High School, 2017); **Emma Eikermann** (Lewis & Clark College, 2017); **Madeline Otto*** (U. of Portland, 2018); **Chimezie Aamefunu** (Univ. of Pennsylvania, 2022)

* indicates trainees who completed and/or are pursuing M.D., Ph.D. or other advanced degree

Postdoctoral Trainees:	dates:	current role:
Deborah M. Hegarty, Ph.D.	2006 - 2012	Senior Research Associate, OHSU
Shelby Suckow, Ph.D.	2009 - 2013	Scientific Program Manager, Allen Brain Institute
Tally Milnes, Ph.D.	2010 - 2014	Assistant Professor, University of Arizona
Damayanti Bagchi, Ph.D.	2022 -	

Other Academic Service:

Faculty Search Committee, Neurological Sciences Institute, Oregon Health & Science University, 2000-02
 Strategic Planning Committee, Neurological Sciences Institute, Oregon Health & Science University, 2006-07
 Core Oversight Committee, OHSU, 2007-2010
 Interprofessional Education Program, OHSU, Small Group Leader, 2013-2014
 Physiology & Pharmacology Shared Equipment Committee, 2015-2021
 National Eye Institute (NEI) Strategic Planning Committee panel on Neuroscience, 2020
 Faculty Senate (elected), OHSU 2020-2022
 Faculty Senate Executive Committee (elected), 2021 - 2022
 OHSU Policy Advisory Committee, 2021- present
 Chemical Physiology & Biochemistry Diversity Equity & Inclusion Committee, 2021 - present
 Faculty Compensation Bridging Task Force, 2021
 Faculty Compensation Equity & Excellence Task Force, 2022

Community and Public Service Activities:

Brain Fair at Oregon Museum of Science and Industry, 2002-2017
 Lectures to Lincoln High School Students about Neuroscience and careers, 2009-2011
 West Sylvan Middle School Science Fair Judge, 2008-2011
 Volunteer at Oregon Food Bank, 2010-2017
 Board Member, Living Yoga (non-profit), 2013-2019
 Volunteer Teacher, Living Yoga (non-profit), 2013-2020
 Women in Science, Portland, 2020 - present

Research Publications (denotes papers selected for Journal cover image):**

1. **Aicher SA**, Randich A (1988) Effects of intrathecal antagonists on the antinociception, hypotension, and bradycardia produced by intravenous administration of [D-Ala²]-methionine enkephalinamide (DALA) in the rat. *Pharmacology, Biochemistry and Behavior*, 30: 65-72.
2. Randich A, **Aicher SA** (1988) Medullary substrates mediating antinociception produced by electrical stimulation of the vagus. *Brain Research*, 445: 68-76.
3. **Aicher SA**, Randich A (1990) Antinociception and cardiovascular responses produced by electrical stimulation in the nucleus tractus solitarius, nucleus reticularis ventralis, and the caudal medulla. *Pain*, 42: 103-119.
4. **Aicher SA**, Lewis SJ, Randich A (1991) Antinociception produced by electrical stimulation of vagal afferents: independence of cervical and subdiaphragmatic branches. *Brain Research*, 542: 63-70.
5. **Aicher SA**, Springston M, Berger SB, Reis DJ, Wahlestedt C (1991) Receptor-selective analogs demonstrate NPY/PYY receptor heterogeneity in rat brain. *Neuroscience Letters*, 130: 32-36.
6. Milner TA, Reis DJ, Pickel VM, **Aicher SA**, Giuliano R (1993) Ultrastructural localization and afferent sources of corticotropin-releasing factor in the rat rostral ventrolateral medulla; implications for central cardiovascular regulation. *Journal of Comparative Neurology*, 333: 151-167.
7. **Aicher SA**, Reis DJ, Ruggiero DA, Milner TA (1994) Anatomical characterization of a novel reticulospinal vasodepressor area in the rat medulla oblongata. *Neuroscience*, 60: 761-779.
8. **Aicher SA**, Reis DJ, Nicolae R, Milner TA (1995) Monosynaptic projections from the gigantocellular reticular formation to sympathetic preganglionic neurons in the thoracic spinal cord. *Journal of Comparative Neurology*, 363: 563-580.
9. **Aicher SA**, Kurucz OS, Reis DJ, Milner TA (1995) Nucleus tractus solitarius efferent terminals synapse on neurons in the caudal ventrolateral medulla that project to the rostral ventrolateral medulla. *Brain Research*, 693: 51-63. **
10. **Aicher SA**, Saravay RH, Cravo S, Jeske I, Morrison SF, Reis DJ, Milner TA (1996) Monosynaptic projections from the nucleus tractus solitarii to C1 adrenergic neurons in the rostral ventrolateral medulla: comparison with input from the caudal ventrolateral medulla. *Journal of Comparative Neurology*, 373: 62-75.
11. **Aicher SA**, Reis DJ (1997) Gigantocellular vasodepressor area is tonically active and distinct from caudal ventrolateral medullary vasodepressor area. *American Journal of Physiology (Regul. Integr. Comp. Physiol.)*, 272: R731-R742.
12. **Aicher SA**, Sharma S, Cheng PY, Pickel VM (1997) The N-Methyl-D-aspartate (NMDA) receptor is postsynaptic to substance P-containing axon terminals in the rat superficial dorsal horn. *Brain Research*, 772: 71-81.
13. Welsh JP, Chang B, Menaker ME, **Aicher SA** (1998) Removal of the inferior olive abolishes myoclonic seizures associated with a loss of olivary serotonin. *Neuroscience*, 82: 879-897.
14. Milner TA, Lee A, **Aicher SA**, Rosin DL (1998) Hippocampal α_{2A} -adrenergic receptors are located predominantly presynaptically but are also found postsynaptically and in selective astrocytes. *Journal of Comparative Neurology*, 395: 310-327.
15. Van Bockstaele EJ, Colago EEO, **Aicher S** (1998) Light and electron microscopic evidence for topographic and monosynaptic projections from neurons in the ventral medulla to noradrenergic dendrites in the rat locus coeruleus. *Brain Research*, 784: 123-138.

Research Publications (continued):

16. Pickel VM, **Aicher SA**, Aoki C, Cheng PY, Nirenberg MJ (1998) Catecholamines, opioids, and vagal afferents in the nucleus of the solitary tract. In: *Advances in Pharmacology, Catecholamines: Bridging Basic Science with Clinical Medicine*, Academic Press 42: 642-645. Review.
17. **Aicher SA**, Sharma S, Pickel VM (1999) *N*-methyl-D-aspartate receptors are present in vagal afferents and their dendritic targets in the nucleus tractus solitarius. *Neuroscience*, 91: 119-132.
18. Milner TA, Rosin DL, Lee A, **Aicher SA** (1999) Alpha_{2A}-adrenergic receptors are primarily presynaptic heteroreceptors in the C1 area of the rat rostral ventrolateral medulla. *Brain Research*, 821: 200-211.
19. **Aicher SA**, Drake CT (1999) Clonidine evokes vasodepressor response via α_2 -adrenergic receptors in gigantocellular reticular formation. *Journal of Pharmacology and Experimental Therapeutics*, 289: 688-694.
20. **Aicher SA**, Milner TA, Pickel VM, Reis DJ (2000) Anatomical substrates for baroreflex sympathoinhibition in the rat. *Brain Research Bulletin*, 51: 107-110. Review.
21. **Aicher SA**, Sharma S, Cheng PY, Liu-Chen LY, Pickel VM (2000) Dual ultrastructural localization of μ -opiate receptors and substance P in the dorsal horn. *Synapse*, 36: 12-20.
22. **Aicher SA**, Hahn B, and Milner TA (2000) *N*-Methyl-D-aspartate-type glutamate receptors are found in post-synaptic targets of adrenergic terminals in the thoracic spinal cord. *Brain Research*, 856: 1-11.
23. Chang PC, **Aicher SA**, Drake CT (2000) Kappa opioid receptors in rat spinal cord vary across the estrous cycle. *Brain Research*, 861: 168-172.
24. Commons KG, **Aicher SA**, Kow LM, Pfaff DW (2000) Presynaptic and postsynaptic relations of μ -opioid receptors to gamma-aminobutyric acid- immunoreactive and medullary-projecting periaqueductal gray neurons. *Journal of Comparative Neurology*, 419: 532-542.
25. **Aicher SA**, Goldberg A, Sharma S, Pickel VM (2000) μ -Opioid receptors are present in vagal afferents and their dendritic targets in the medial nucleus tractus solitarius. *Journal of Comparative Neurology*, 422: 181-190.
26. **Aicher SA**, Punnoose A, Goldberg A (2000) μ -Opioid receptors often colocalize with the substance P receptor (NK1) in the trigeminal dorsal horn. *Journal of Neuroscience*, 20: 4345-4354.
27. **Aicher SA**, Kraus JA, Sharma S, Patel A, Milner TA (2001) Selective distribution of μ -opioid receptors in C1 adrenergic neurons and their afferents. *Journal of Comparative Neurology*, 433: 23-33.
28. **Aicher SA**, Schreihofer AM, Kraus JA, Sharma S, Milner TA, Guyenet PG (2001) μ -opioid receptors are present in functionally identified sympathoexcitatory neurons in the rat rostral ventrolateral medulla. *Journal of Comparative Neurology*, 433: 34-47.
29. Glass MJ, Huang J, **Aicher SA**, Milner TA, Pickel VM (2001) Subcellular localization of α -2A-adrenergic receptors in the rat medial nucleus tractus solitarius: regional targeting and relationship with catecholamine neurons. *Journal of Comparative Neurology*, 433: 193-207.
30. **Aicher SA** (2001) Heterogeneous receptor distribution in autonomic neurons. *Annals of the New York Academy of Sciences*, 940: 307-13. Review.
31. Milner TA, Drake CT, **Aicher SA** (2001) Cellular relations between μ -opioid receptive, GABAergic and reticulospinal neurons in the rostral ventrolateral medulla. *Brain Research*, 917: 1-14.
32. Abbadie C, Pasternak GW, **Aicher SA** (2001) Presynaptic localization of the carboxy-terminus epitopes of the μ opioid receptor splice variants MOR-1C and MOR-1D in the superficial laminae of the rat spinal cord. *Neuroscience*, 106: 833-842.

Research Publications (continued):

33. Guyenet PG, Stornetta RL, Schreihof AM, Pelaez NM, Hayar A, **Aicher S**, Llewellyn-Smith IJ (2002) Opioid signaling in the rat rostral ventrolateral medulla. *Clinical and Experimental Pharmacology and Physiology*, 29: 238-242. Review.
34. Milner TA, Drake CT, **Aicher SA** (2002) C1 adrenergic neurons are contacted by presynaptic profiles containing delta-opioid receptor immunoreactivity. *Neuroscience*, 110: 691-701.
35. Welsh JP, Placantonakis DG, Warsetsky SI, Marquez RG, Bernstein L, **Aicher SA** (2002) The serotonin hypothesis of myoclonus from the perspective of neuronal rhythmicity. *Advances in Neurology*, 89: 307-329.
36. Welsh JP, Yuen G, Placantonakis DG, Vu TQ, Haiss F, O'Hearn E, Molliver ME, **Aicher SA** (2002) Why do purkinje cells die so easily after global brain ischemia? Aldolase C, EAAT4, and the cerebellar contribution to posthypoxic myoclonus. *Advances in Neurology*, 89: 331-359.
37. **Aicher SA**, Goldberg A, Sharma S (2002) Co-localization of mu opioid receptor and N-methyl-D-aspartate receptor in the trigeminal dorsal horn. *The Journal of Pain*, 3: 203-210.
38. **Aicher SA**, Mitchell JL, Mendelowitz D (2002) Distribution of μ -opioid receptors in rat visceral premotor neurons. *Neuroscience*, 115: 851-860.
39. **Aicher SA**, Sharma S, Mitchell JL (2002) Co-localization of AMPA receptor subunits in the nucleus of the solitary tract in the rat. *Brain Research*, 958: 454-458.
40. Irnaten M., **Aicher SA**, Wang J, Venkatesan P, Evans C, Baxi S, Mendelowitz D (2003) μ -opioid receptors are located postsynaptically and endomorphin-1 inhibits voltage-gated calcium currents in premotor cardiac parasympathetic neurons in the rat nucleus ambiguus. *Neuroscience*, 116: 573-582.
41. **Aicher SA**, Sharma, S, Mitchell JL (2003) Structural changes in AMPA-receptive neurons in the nucleus of the solitary tract of spontaneously hypertensive rats. *Hypertension*, 41: 1246-1252.
42. **Aicher SA**, Mitchell JL, Swanson KC, Zadina JE (2003) Endomorphin-2 axon terminals contact mu-opioid receptor-containing dendrites in trigeminal dorsal horn. *Brain Research*, 977: 190-198.
43. **Aicher SA** (2003) The gigantocellular depressor area revisited. *Cellular and Molecular Neurobiology*, 23: 479-90. Review.
44. **Aicher SA**, Silverman MB, Winkler CW, Bebo BF Jr (2004) Hyperalgesia in an animal model of multiple sclerosis. *Pain*, 110: 560-570.
45. Mitchell JL, Silverman MB, **Aicher SA** (2004) Rat trigeminal lamina I neurons that project to thalamic or parabrachial nuclei contain the μ -opioid receptor. *Neuroscience*, 128: 571-582.
46. Silverman MB, Hermes SM, Zadina JE, **Aicher SA** (2005) Mu-opioid receptor is present in dendritic targets of endomorphin-2 axon terminals in the nuclei of the solitary tract. *Neuroscience*, 135: 887-896.
47. Drake CT, **Aicher SA**, Montalmant FL, Milner TA (2005) Redistribution of mu opioid receptors in C1 adrenergic neurons following chronic administration of morphine. *Experimental Neurology*, 196: 365-372.
48. Hermes SM, Mitchell JL, **Aicher SA** (2006) Most neurons in the nucleus tractus solitarii do not send collateral projections to multiple autonomic targets in the rat brain. *Experimental Neurology*, 198: 539-551.
49. Placantonakis DG, Bukovsky AA, **Aicher SA**, Kiem H.-P., Welsh JP (2006) Continuous electrical oscillations emerge from a coupled network: A study of the inferior olive using lentiviral knockdown of connexin 36. *Journal of Neuroscience*, 26: 5008-5016.

Research Publications (continued) (** denotes papers selected for Journal cover image):

50. Winkler CW, Hermes SM, Chavkin CI, Drake CT, Morrison SF, **Aicher SA** (2006) Kappa opioid receptor (KOR) and GAD67 immunoreactivity are found in OFF and Neutral cells in the rostral ventromedial medulla. *Journal of Neurophysiology*, 96: 3465-3473.
51. Bailey TW, Hermes SM, Andresen MC, **Aicher SA** (2006) Cranial visceral afferent pathways through the nucleus of the solitary tract to caudal ventrolateral medulla or paraventricular hypothalamus: Target-specific synaptic reliability and convergence patterns. *Journal of Neuroscience*, 26: 11893-11902.
52. Zeng J, Thomson LM, **Aicher SA**, Terman GW (2006) Primary afferent NMDA receptors increase dorsal horn excitation and mediate opiate tolerance in neonatal rats. *Journal of Neuroscience*, 26: 12033-12042.
53. Drake CT, de Oliveria AX, Harris JA, Connor DM, Winkler CW, **Aicher SA** (2007) Kappa opioid receptors in the rostral ventromedial medulla of male and female rats. *Journal of Comparative Neurology*, 500: 465-476.
54. Bailey TW, Hermes SM, Whittier KL, **Aicher SA**, Andresen MC (2007) A-type potassium channels differentially tune afferent pathways from solitary tract nucleus to caudal ventrolateral medulla or paraventricular hypothalamus. *Journal of Physiology*, 582: 613-628.
55. Hegarty DM, Mitchell JL, Swanson KC, **Aicher SA** (2007) Kainate receptors are primarily postsynaptic to substance P-containing axon terminals in trigeminal dorsal horn. *Brain Research*, 1184: 149-159.
56. Hermes SM, Mitchell JL, Silverman MB, Lynch PJ, McKee BL, Bailey TW, Andresen MC, **Aicher SA** (2008) Sustained hypertension increases the density of AMPA receptor subunit, GluR1, in baroreceptive regions of the nucleus tractus solitarii of the rat. *Brain Research*, 1187: 125-136.
57. Thomson LM, Terman GW, Zeng J, Lowe J, Hermes SM, Hegarty DM, **Aicher SA** (2008) Increased substance P release and NK1 receptor down regulation in the spinal cord dorsal horn of opiate tolerant neonatal rats. *Journal of Pain*, 9: 11-19. **
58. Morgan MM, Whittier KL, Hegarty DM, **Aicher SA** (2008) Periaqueductal gray neurons project to spinally projecting GABAergic neurons in the rostral ventromedial medulla. *Pain*, 140: 376-386. **
59. Parrish DC, Alston EN, Rohrer H, Hermes SM, **Aicher SA**, Nkadi P, Woodward WR, Stubbusch J, Gardner RT, Habecker BA (2009) The absence of gp130 in dopamine beta hydroxylase-expressing neurons leads to autonomic imbalance and increased reperfusion arrhythmias. *American Journal of Heart and Circulatory Physiology*, 297: H960-967.
60. Macey TA, Bobeck EN, Hegarty DM, **Aicher SA**, Ingram SL, Morgan MM. (2009) Extracellular signal-regulated kinase 1/2 activation counteracts morphine tolerance in the periaqueductal gray of the rat. *Journal of Pharmacology and Experimental Therapeutics*, 331: 412-418.
61. Macey TA, Ingram SL, Bobeck EN, Hegarty DM, **Aicher SA**, Arttamangkul S, Morgan MM. (2010) Opioid receptor internalization contributes to dermorphin-mediated antinociception. *Neuroscience*, 168: 543-550.
62. Hegarty DM, Tonsfeldt K, Hermes SM, Helfand H, **Aicher SA** (2010) Differential localization of vesicular glutamate transporters and peptides in corneal afferents to trigeminal nucleus caudalis. *Journal of Comparative Neurology*, 518: 3557-3569.
63. Cassaglia PA, Hermes SM, **Aicher SA**, Brooks VL. (2011) Insulin acts in the arcuate nucleus to increase lumbar sympathetic nerve activity and baroreflex function in rats. *Journal of Physiology*, 589: 1643-1662.

Research Publications (continued) (** denotes papers selected for Journal cover image):

64. **Aicher SA**, Hermes SM, Whittier KL, Hegarty DM (2012) Descending projections from the rostral ventromedial medulla (RVM) to trigeminal and spinal dorsal horns are morphologically and neurochemically distinct. *Journal of Chemical Neuroanatomy*, 43:103-111.
65. Cyr MC, Ingram SL, **Aicher SA**, Morgan MM (2012) Chronic psychostimulant exposure to adult, but not periadolescent rats reduces subsequent morphine antinociception. *Pharmacology Biochemistry and Behavior*, 101: 538-543.
66. Wilson-Poe AR, Morgan MM, **Aicher SA**, Hegarty DM (2012) Distribution of CB1 cannabinoid receptors and their relationship with mu-opioid receptors in the rat periaqueductal gray. *Neuroscience*, 213: 191-200.
67. Suckow SK, Deichsel EL, Ingram SL, Morgan MM, **Aicher SA** (2013) Columnar distribution of catecholaminergic neurons in the ventrolateral periaqueductal gray and their relationship to efferent pathways. *Synapse*, 67: 94-108. **
68. **Aicher SA**, Hermes SM, Hegarty DM. (2013) Corneal afferents differentially target thalamic- and parabrachial-projecting neurons in trigeminal subnucleus caudalis. *Neuroscience*, 232: 182-193.
69. Mehalick M L, Ingram SL, **Aicher SA**, Morgan MM (2013) Chronic inflammatory pain prevents tolerance to the antinociceptive effect of morphine microinjected into the ventrolateral periaqueductal gray of the rat. *Journal of Pain*, 14:1601-1610.
70. Hermes SM, Colbert JF, **Aicher SA** (2014) Differential content of vesicular glutamate transporters in subsets of vagal afferents projecting to the nucleus tractus solitarii in the rat. *Journal of Comparative Neurology*, 522: 642-653.
71. **Aicher SA**, Hegarty DM, Hermes SM (2014) Corneal pain activates a trigemino-parabrachial pathway in rats. *Brain Research*, 1550: 18-26. **
72. Largent-Milnes TM, Hegarty DM, **Aicher SA**, Andresen MC (2014) Physiological temperatures drive glutamate release onto trigeminal dorsal horn neurons. *Journal of Neurophysiology*, 111: 2222 - 31.
73. Hegarty DM, Hermes SM, Largent-Milnes TM, **Aicher SA** (2014) Capsaicin-responsive corneal afferents do not contain TRPV1 at their central terminals in trigeminal nucleus caudalis in rats. *Journal of Chemical Neuroanatomy*, 61-62: 1 – 12.
74. Moldavan M, Cravetchi O, Williams M, Irwin RP, **Aicher SA**, Allen CN (2015) Localization and expression of GABA transporters in the superchiasmatic nucleus. *Eur J Neurosci*. 42: 3018-32.
75. **Aicher SA**, Hermes SM, Hegarty DM (2015) Denervation of the lacrimal gland leads to corneal hypoalgesia in a novel rat model of aqueous dry eye disease. *Invest Ophthalmol Vis Sci*, 56: 6981-6989.
76. Bobeck EN, Ingram SL, Hermes SM, **Aicher SA**, Morgan MM (2016) Ligand-biased activation of extracellular signal-regulated kinase 1/2 leads to differences in opioid induced antinociception and tolerance. *Behav Brain Res* 298: 17 -24.
77. Hermes SM, Andresen MC, **Aicher SA** (2016) Localization of TRPV1 and P2X3 in unmyelinated and myelinated vagal afferents in the rat. *J Chem Neuroanatomy*, 72: 1 - 7.
78. Nestor CC, Qiu J, Padilla SL, Zhang C, Bosch MA, Fan W, **Aicher SA**, Palmiter RD, Ronnekleiv OK, Kelly MJ (2016) Optogenetic stimulation of arcuate nucleus Kiss1 neurons reveals a steroid-dependent glutamatergic input to POMC and AgRP neurons in male mice. *Mol Endocrinol* 30: 630-44.
79. Hegarty DM, Hermes SM, Yang K, **Aicher SA** (2017) Select noxious stimuli induce changes in corneal nerve morphology. *J Comp Neurol* 525: 2019-2031.

Research Publications (continued):

80. Winters BL, Gregoriou GC, Kissiwa SA, Wells OA, Medagoda DI, Hermes SM, Burford NT, Alt A, **Aicher SA**, Bagley EE (2017) Endogenous opioids regulate moment-to-moment neuronal communication and excitability. *Nature Commun* 8:14611.
81. Hegarty DM, Hermes SM, Morgan MM, **Aicher SA** (2018) Acute hyperalgesia and delayed dry eye after corneal abrasion injury. *Pain Reports*, Vol 3, Issue 4, p e664.
82. Slaker ML, Jorgensen ET, Hegarty DM, Liu X, Kong Y, Zhang F, Linhardt RJ, Brown TE, **Aicher SA**, Sorg BA (2018) Cocaine exposure modulates perineuronal nets and synaptic excitability of fast-spiking interneurons in the medial prefrontal cortex. *eNeuro* 5(5) e0221-18.2018, 1 – 17.
83. Hegarty DM, David LL, **Aicher SA** (2018) Lacrimal gland denervation alters tear protein composition and impairs ipsilateral eye closures and corneal nociception. *Invest Ophthalmol Vis Sci* 59:5217-5224.
84. Jorgensen ET, Gonzalez AE, Harkness JH, Hegarty DM, Thakar A, Burchi DJ, Aadland JA, **Aicher SA**, Sorg BA, Brown TE (2020) Cocaine memory reactivation induces functional adaptations within parvalbumin interneurons in the rat medial prefrontal cortex. *Addiction Biology*, e12947.
85. Wang W, Cho H, Kim D, Park Y, Moon JH, Lim SJ, Yoon SM, McCane M, **Aicher SA**, Kim S, Emery B, Lee JW, Lee S, Park Y, Lee SK (2020) PCR2 Acts as a critical timer that drives oligodendrocyte fate over astrocyte identity by repressing the notch pathway. *Cell Reports*, Sep 15; 32(11):108147. doi:10.1016/j.celrep.2020.108147.
86. Harkness JH, Gonzalez AE, Bushana PN, Jorgensen ET, Hegarty DM, Di Nardo AA, Prochiantz A, Wisor JP, **Aicher SA**, Brown TE, Sorg BA (2021) Diurnal changes in perineuronal nets and parvalbumin neurons in the rat medial prefrontal cortex. *Brain Struct Funct*, May;226(4):1135-1153. doi: 10.1007/s00429-021-02229-4.
87. Tibbitts DC, **Aicher SA**, Sugg J, Handloser K, Booth LD, Bradley RD (2021) Program evaluation of trauma-informed yoga for vulnerable populations. *Eval Program Plann*, 88: 101946.
88. Fawley HA, Hegarty DM, **Aicher SA**, Beaumont E, Andresen MC (2021) Dedicated c-fiber vagal sensory afferent pathways to the paraventricular nucleus of the hypothalamus. *Brain Res* 1769:147625.
89. Mammel AE, Delgado KC, Chin AL, Condon AF, Hill JQ, **Aicher SA**, Wang Y, Fedorov LM, Robinson FL. (2021) Distinct roles for the Charcot-Marie-tooth disease-causing endosomal regulators Mtmr5 and Mtmr13 in axon radial sorting and Schwann cell myelination. *Hum Mol Genet*. Oct 27;ddab311. doi: 10.1093/hmg/ddab311. Online ahead of print.
90. Levine A, Liktov-Busa E, Lipinski AA, Couture S, Balasubramanian S, **Aicher SA**, Langlais PR, Vanderah TW, Largent-Milnes TM. (2021) Sex differences in the expression of the endocannabinoid system within V1M cortex and PAG of Sprague Dawley rats. *Biol Sex Differ*. Nov 8;12(1):60. doi: 10.1186/s13293-021-00402-2.
91. Lebowitz JJ, Trinkle M, Bunzow JR, Balcita-Pedicino JJ, Hetelekides S, Robinson B, De La Torre S, **Aicher SA**, Sesack SR, Williams JT. (2021) Subcellular localization of D2 receptors in the murine substantia nigra. *Brain Struct Funct*. Dec 2. doi: 10.1007/s00429-021-02432-3. Online ahead of print.
92. Hamity MV, Kolker SJ, Hegarty DM, Blum C, Langmack L. **Aicher SA**, Hammond DL (2022) Nicotinamide riboside alleviates corneal and somatic hypersensitivity induced by paclitaxel in male rats. *Invest Ophthalmol Vis Sci* 63 (1):38.
93. Ishibashi M, Keung J, Morgans CW, **Aicher SA**, Carroll JR, Singer JH, Jia L, Li W, Fahrenfort I, Ribelayga CP, Massey SC (2022) Analysis of rod/cone gap junctions from the reconstruction of mouse photoreceptor terminals. *Elife* Apr 26;11:e73039. doi: 10.7554/eLife.73039. Online ahead of print.

Research Publications (continued):

94. Barrett MS, Hegarty DM, Habecker BA, **Aicher SA** (2022) Distinct morphology of cardiac- and brown adipose tissue-projecting neurons in the stellate ganglia of mice. *Physiol Reports*. May;10(10):e15334. doi: 10.14814/phy2.15334