

Date: Thursday, October 8, 2020

Name: Harald W. Sontheimer

Citizenship: United States of America

Foreign Languages: German

RANK/TITLE Professor/Executive Director

DEPARTMENT Neuroscience

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HOSPITAL AND OTHER (NON-ACADEMIC) APPOINTMENTS: None

PROFESSIONAL CONSULTANTSHIPS:

Scientific Advisory Board, The Max Plank Society
Scientific Advisory Board: MIT Press
Scientific Advisory Council American Brain Tumor Association (ABTA)
Scientific Board of Directors: Citizens United for Research on Epilepsy (CURE)

EDUCATION:

Institution	Degree	Year
University of Ulm, F.R.G.	Vordiplom (German equivalent to "B.S.")	1982
University of Ulm, F.R.G.	Biology Diploma (M.S.)	1986
University of Heidelberg, F.R.G.	Department of Comparative Neurobiology Ph.D, Department for Neurobiology	1989

MILITARY SERVICE: None

LICENSURE: None

BOARD CERTIFICATION: N/A

POSTDOCTORAL TRAINING:

Year	Rank/Title	Institution
1989 - 1991	Postdoctoral Associate	Department of Neurology, Yale University, New Haven, Connecticut

ACADEMIC APPOINTMENTS: (In reverse chronological order)

Year	Rank/Title	Institution
2015-2020	Executive Director	Virginia Tech School of Neuroscience
2015-present	Director	Glial Biology in Health, Disease and Cancer Center, Fralin Biomedical Research Institute, Roanoke, VA
2014	Visiting Professor	Rhodes College, Memphis TN
2006-2015	Director	Center for Glial Biology in Medicine, UAB
2005-2015	Director	Civitan International Research Center, UAB
2001-2008	Director	Cellular and Molecular Biology Graduate Program, UAB
2000-present	Professor	Department of Neurobiology, UAB, <i>Primary Appointment, Secondary in Cell Biology, Physiology, Neurology, Pediatrics & Vision Science</i>
1997-2000	Associate Professor	Department of Neurobiology, UAB; <i>Secondary Appointments in Physiology & Biophysics, & Cell Biology.</i>
1997-present	Senior Scientist	Comprehensive Cancer Center, UAB
1994-1996	Assistant Professor	Department of Cell Biology, UAB <i>Secondary Appointment.</i>
1994-1996	Assistant Professor	Department of Physiology and Biophysics, University of Alabama at Birmingham (UAB), Birmingham, AL
1994-1996	Associate Scientist	Neurobiology Research Center, UAB
1992-1994	Assistant Professor	Section of Neurobiology, Yale University, New Haven, Connecticut.
1991-1994	Faculty	Yale Cancer Center, Yale University, New Haven, Connecticut
1991-1994	Assistant Professor	Department of Neurology, Yale University, New Haven, Connecticut.

AWARDS/HONORS:

1986-1988	Studienstiftung des Deutschen Volkes, Promotions-Stipendium("Scholarship from the Federal Republic of Germany")
1989	Graduation with "summa cum laude", highest honors (mit Auszeichnung)
1991	RSG, NIH Fluid Research Fund
1992	Winter Conference on Brain Research (WCBR) Fellow
1992	Dean's Young Faculty Award
2004	McNulty Civitan Scientist Award
2010	Dean's Award for Excellence in Mentorship
2015	I.D. Wilson endowed Chair Virginia Tech

2016 PROSE award: Winner of the 40th annual award for Best textbook – Biological and Life Sciences for “Diseases of the Nervous System”, Elsevier

PROFESSIONAL SOCIETIES AND MEMBERSHIPS:

American Association for the Advancement of Science
European Society for Neuroscience
German Zoological Society
New York Academy of Sciences
Society for Neuroscience
Society for Neurochemistry
Society for Developmental Neuroscience

COUNCILS AND COMMITTEES:

Scientific Advisory Board “Cure Epilepsy”	2013-present
Scientific Advisory Board, The MIT Press	2003-present
Scientific Advisory Board, The Max Plank Society	2008-2014
Scientific Advisory Council, Society for Neuroscience Program Committee	2006-2009
Society for Neurochemistry Program Committee	2007-present
American Brain Tumor Association (ABTA)	
Scientific Advisory Council	2010-present
College of CSR Reviewers	2010-present
Chair Gordon Conference on Glial Biology	2015

Study Section Services:

NIH NINDS Neuro B1	1995
NIH NINDS NSPB	1995, 1996
NIH NINDS MDCN2	2000-2002
American Cancer Society	1999-2000 Cancer Drug Development
NIH Special Emphasis Panel	1999
Paralyzed Veterans of America	1999-2000
Howard Hughes Medical Institute	
Medical Student Fellowship Review Panel	1999-2002
NIH NINDS NDGB Regular Member	2003-2007
NIH NINDS CMBG Ad-hoc	2009-present

Outside Reviewer:

Department of Veterans Affairs	1997-1999, 2010
Human Frontier Science Program	1996
National Science Foundation	1989, 1992, 1994
National Institutes of Health	1994, 1995, 1998, 1999
National Research Council, Canada	1996, 1997
Swiss Natl. Sci. Foundation	1992, 1995
Spinal Cord Res. Foundation	1997, 1998, 1999
Paralyzed Veterans of America	
Research Foundation	1993, 1998, 1999
The Wellcome Trust, U.K.	1995

UNIVERSITY ACTIVITIES:

Graduate Biomedical Sciences Steering Committee
Director, Cellular & Molecular Biology Graduate Program 2002-2008
Physiology & Biophysics Graduate Committee 1996-1997
Neuroscience Advisory Group, 1996
Neuroscience Recruitment week, 1995, 1996
Conflict of Interest Review Board, 1997-2002
University wide Promotion and Tenure committee, 2000-2003
Medical Research Advisory Council, 2000-2003
UAB Strategic Plan, and Implementation committees
Graduate committee member for numerous UAB students enrolled in Cell Biology,
Physiology or Pharmacology
Pathology, Search Committee 2007
Pharmacology, Search Committee 2007/2008
Graduate Biomedical Sciences, Steering committee 2009-present
LCME Committee Chair 2013
Chair Search Committee BME 2019

EDITORIAL BOARD MEMBERSHIPS:

Glial-Neuronal Biology, 2008-2012
Deputy Editor, NeuroReport: 1997-2002
Glia: 1996-present
The Neuroscientists: 2016-present
J. Neuroscience Research: 2003-present
Cerebrum, Dana Foundation, Scientific Board member 2018-present
Cancers (<https://www.mdpi.com/journal/cancers>) 2019-present

Associate Editor for Journal of Neuroscience Letters: 2003-2007

Referee: American Journal of Physiology, Annals of Neurology, Brain Research, Can. J. Physiol., European J. Physiology, Experimental Neurology, Glia, J. Physiology (London), J. Neurobiology, J. Neuroscience, J. Neurochemistry, J. Neurophysiology, J. Neuroscience Research, J. Neuropharmacology, Molecular and Cellular Neurosciences, Molecular Pharmacology, Nature Medicine, Nature Neuroscience, Nature Biotechnologies, NeuroReport, New England J. Medicine, Neuroscience, Neuroscience Letters, Science, Science Transl. Med.

MAJOR LECTURES AND VISITING PROFESSORSHIPS:

- 1991 Astrocytes, as well as neurons, express a diversity of ion channels. IBRO satellite meeting, Saskatoon, Canada, on Ions-Water-Energy in Brain Cells (Aug. 10-14).
- 1993 Winter Conference on Brain Research, Whistler, British Columbia Canada. Na⁺ channels in glial cells.
- 1994 Ion channels in glial cells. Gordon Conference on Myelin. Casa Sirena Resort, Oxnard, CA.

- 1994 Possible functional roles for glial Na⁺ channels. Human Frontier Science Program Workshop on transmitter receptors and ion channels in glial cells. Castle Eckberg, Dresden, Germany.
- 1995 Voltage-activated ion channels are expressed in glial cells in vivo: Alterations in disease, malignancy and in response to injury. Corsican Hippocampus Conferences, Corsica France.
- 1995 Ion channel expression and function in glial tumors and astrocytic scars. Cellular and molecular mechanisms of regeneration and functional repair in the CNS. Monastery Ohrbeck, Germany.
- 1996 Winter Conference on Brain Research, Snowmass Colorado, Panel presentation. Properties and Function of glial ion channels.
- 1996 The role of ion channels in cell proliferation of glia and glioma cells. International Symposium, Gap junctions in the nervous system. Seon, Germany (05/03-05/07/96).
- 1996 Ion channel function in glia and glioma cells. Symposium, International Society for Developmental Neuroscience (ISDN) Meeting, Tampere, Finland (07/30-08/3/96).
- 1997 Workshop on glial ion channels and nervous system diseases (chairman), WCBR Breckenridge, Colorado (01/25-02/01/97)
- 1997 Satellite Symposium for the 27th Annual Meeting of the Society for Neuroscience “NO and other diffusible signals in brain development, plasticity and disease”, Glial glutamate transport as a target for NO: consequences for neurotoxicity. New Orleans (10/24/97).
- 1997 Organizer and Chair of Symposium “New insights into brain tumor biology provide novel targets for diagnosis and therapy”, and seminar speaker “A novel glioma specific chloride channel: diagnostic and therapeutic potential”. 27th Annual Meeting of the Society for Neuroscience, New Orleans (10/28/97).
- 1998 Nature Biotechnology Conference “PharmacoGenesis: Postgenomic drug discovery through developmental biology”, Boston, MA (3/26-27/98) Speaker: “Glioma Chloride channels: possible target for treatment of primary brain tumors”.
- 1999 American Association for the Advancement of Science, “Scorpion toxin as a diagnostic and therapeutic tool for primary brain tumors” Anaheim CA (1/23/99)
- 1999 Advances in Ion Channel Research, Symposium “Glioma Cl⁻ channels and their potential therapeutic utility” San Francisco (3/14-3/17/99).
- 1999 Centennial Meeting of the American Physics Society, “The role of Neuroglia in brain function and disease” Atlanta (3/25/99).
- 1999 Woods Hole, MA, Marine Biological Laboratories, Course Faculty “Pathogenesis of Neuroimmunological Diseases (8/99)
- 1999 Neurobiology of Disease Workshop, Society for Neuroscience, Miami (10/22/99).
- 2000 American Epilepsy Soc., LA, “A possible role for astrocytes in epilepsy”(12/04/01)
- 2001 Channelopathies Conference, Sheffield England, “Role of K⁺ and Cl⁻ channels in the invasive behavior of glioma cells” (6/30-7/03/01).
- 2002 127th Annual Meeting of the American Neurological Association, New York. Keynote lecture: Glial amino acid transport contributes to neurological disorders (10/15/02).
- 2003 Gordon Conference on Glial Neuronal Interactions, “Role of Cl⁻ channels and amino acid transporters in glioma biology” (2/24-2/28/03).
- 2004 Glioma Conference, Berlin Germany, (12/03/04) Keynote speaker, “Ion channels and amino acid transporters support the growth and invasion of malignant gliomas:
- 2004 American Epilepsy Society, Symposium speaker, “Astrocytes and Epileptogenesis” New Orleans (12/07/04).
- 2005 Keynote speaker at the Glial Neuronal Interaction conference in Montreal: “Role of ion channels and amino acid transport in glioma biology” (06/22/05)

- 2005 The Society for Neuroscience, Symposium Co-Chair and speaker. “Astroglial regulation of synaptic transmission and epilepsy, (11/12/05)
- 2007 Keynote speaker, Neuroscience Research Day, The University of Ohio, Toledo, OH, “Ion channels and amino acid transport aid the biology of malignant gliomas”, (2/16/07)
- 2007 Burton Horowitz Lecture, University of Nevada School of Medicine, “Ion channels and amino-acid transporters support the growth and invasion of primary brain tumors” (12/6/07)
- 2008 American Society for Neurochemistry, San Antonio, TX, “Biological changes that support the growth and invasion of malignant gliomas”, (3/03/08)
- 2008 USA-Japan Joint Meeting for Glial Research, Philadelphia, PA, “Ion channels and amino acid transporters aid the biology of glial-derived brain tumors”, (3/20/08)
- 2008 Gordon Conference, Mechanisms of Epilepsy, Colby College, MA. “Glutamate release from gliomas facilitates tumor growth and triggers peritumoral seizures” (8/3/2008).
- 2008 Gordon Conference, Glial Biology: Functional Interactions Among Glia & Neurons. “Strategies to Treat Gliomas by Targeting Ion Channels and Transporters” (3/20/2009).
- 2009 William Shucart Lecture, Tuft University: “New treatments for primary brain tumors: ion channels and amino-acid transporters as drug targets” (5/7/2009).
- 2010 Rush and Helen Record Keynote Lecturer, Department of Neuroscience, Baylor College of Medicine (2/19/2010)
- 2010 Glial Biology in Medicine Conference: “Tumor associated seizures” (12/6/2010)
- 2011 League Against Epilepsy Congress, Rome, “Pathophysiological and peritumoral changes underlying tumor-related epilepsy” (8/31/2011)
- 2011 Plenary Speaker, 10th international European meeting on Glial cell in Health and Disease Glia, Prague “Glial derived brain tumors: unique biology and opportunities for novel treatments. (9/15/2011)
- 2012 Keynote speaker, Stony Brook Cancer Center, Targeted Therapies in Cancer (4/24/2012)
- 2012 Keynote speaker, Neuroscience Retreat, Medical College of Georgia “Unique Biology of Malignant Gliomas: challenges and opportunities” (10/5/2012)
- 2013 Keynote Speaker, Ions in Flux, Soc. Neurochem. Meeting Cancun: “Role of System Xc in glioma Biology” (4/24-28/2013)
- 2013 Keynote speaker, Society for Neuroscience Annual meeting, “Glioma: A Neurocentric Look at Cancer” (11/13/2013)
- 2014 Keynote Speaker, Neuroscience Day 2014, Wright State University, Dayton, OH (5/16/2014)
- 2014 World Experts in Health and Medical Science, Copenhagen, Denmark, “Primary Brain Tumors: Can Neuroscience provide much needed Therapies”. (5/8/2014)
- 2015 Keynote Speaker, Brain Tumor Meeting, “Glioma, a neurocentric look at cancer” (5/10/2015).
- 2016 Cold Spring Harbor Conference on Glial Biology in Health and Disease. “Glia as drivers of Epilepsy” (7/23/2016)
- 2017 Keynote Speaker, Belgium Society for Neuroscience, Ghent, (5/22/2017)
- 2018 International Astrocyte Biology School, Faculty April 15-121, 2018 Bertinoro Italy.
- 2019 Central Virginia Neuroscience Chapter Annual Meeting, April 12-13, 2019. Charlottesville. “Perineuronal nets in epilepsy”.

INVITED SEMINARS - NATIONAL, INTERNATIONAL

- 1987 Glutamate responses in cultured mammalian astrocytes are mediated by non-NMDA type channels. Department for Zoology and Neurobiology, University of Bochum, F.R.G.

- 1988 Glutamate opens Na^+/K^+ channels in cultured astrocytes Department for Zoology, University of Duesseldorf, F.R.G.
- 1988 Developmental regulation of ion-channel expression in oligodendrocytes. Department of Neurology, Yale University, New Haven, Connecticut.
- 1988 Channel expression correlates with differentiation stage during the development of oligodendrocytes from their precursor cells in culture. Albany Medical College, Division of Neurosurgery, Albany, New York. Host: Harold Kimelberg.
- 1988 Developmental regulation of ion-channel expression in cultured glial-precursor cells and oligodendrocytes. Department of Biology, University of California, Los Angeles, California. Host: Meyer Jackson.
- 1989 Functional chloride channels by mammalian cell expression of rat glycine receptor subunit. Neuroscience Research Center, Hoffmann-LaRoche, Basel, Switzerland.
- 1990 Na^+ -current expression in rat hippocampal astrocytes *in vitro*: Alterations during development. Department of Developmental Neurobiology, National Institute of Health, Bethesda, Maryland. Host: Phil Nelson.
- 1992 Voltage-gated Na^+ channels in glia - New evidence regarding their function. Department of Developmental Neurobiology, National Institute of Health, Bethesda, Maryland, Host: Vittorio Gallo.
- 1993 Properties and function of glial ion channels. Department of Cellular and Molecular Pharmacology, Brown University, Providence, RI. Host: Ed Hawrot.
- 1993 Glial Na^+ channels promote Na^+/K^+ -ATPase function. Department of Neurophysiology, University of Wisconsin, Madison WI. Host: Bill Chiu.
- 1993 Ion channel function in glial cells. The Roche Institute, Nutley NJ.
- 1995 Ion channel expression and function in glia and glioma cells. Dept. Pharmacology, Emory University, Atlanta GA. Host, Ray Dingledine. (12/05/95)
- 1996 Ion channels in glia and glioma cells. Departments of Cellular and Structural Biology and Physiology, University of Colorado Health Sciences Center, Denver, CO. Host, John Caldwell. (01/26/96)
- 1996 Properties and function of ion channels in glia and glioma cells. Department of Medical Physiology, University of Calgary, Calgary Canada, Host, Brian MacVicar. (03/29/96)
- 1996 Ion channel expression and their role in proliferation in glia and glioma cells. Department of Physiology, The University of Michigan, Ann Arbor. Host, Don Puro (05/28/96).
- 1996 The role of ion channels in glioma cells and astrocytic scars. Neuroscience Research Center, Louisiana State University Medical Center (LSUMC) (08/12/96) Host: Nicolas Bazan.
- 1996 A novel glioma specific ion channel: A possible diagnostic or therapeutic target? University of Toronto and Toronto Western Hospital, Neuroscience Unit. (09/05/96) Host: Elizabeth Theriault.
- 1996 Ion channels in glia and glioma cells. Department of Physiology and Neuroscience, The University of Connecticut. (09/18/96)
- 1997 Ion channels in glial cells: current concepts. Albany Medical College (04/09/97)
- 1997 Properties and function of ion channels in glia and glioma cells. Park Davis Inc., Ann Arbor Michigan. (04/29/97)
- 1997 Properties of astrocytes associated with human epileptic seizure foci. WONEOP satellite symposium, Adare, Ireland. (6/25-6/29/97)
- 1997 Properties and function of ion channels in glia and glioma cells. Wyeth-Ayerst Pharmaceuticals, Princeton NJ. (7/23/97)

- 1998 Current approaches to the study of astrocytes. Winter Conference on Brain Research, Snowbird, Utah (1/24-1/31/98).
- 1998 Glioma chloride channel as diagnostic or therapeutic target. Berlex Pharmaceutical, Wayne NJ (3/6/98).
- 1998 The role of ion channel in proliferation and migration of glioma cells. National Institute of Health, Bethesda, ML, Host: Vittorio Gallo (3/11/98)
- 1998 Ion channels in glia and glioma cells. New York University, School of Medicine, Host: Margaret Rice (5/4/98).
- 1998 Ion channels provide novel targets for treatment and diagnosis of primary brain tumors. The Beckman Research Institute, City of Hope, CA, Host: Michael Barish (8/18/98).
- 1999 High grade gliomas express Ca^{2+} -activated K^{+} channels. Winter Conference on Brain Research, Snowmass, CO (01/23/99-01/01/30/99)
- 2000 The role of astrocytes in glutamateric neurotransmission. IASSID World Congress, Seattle WA (8/2/00).
- 2000 The physiology of astrocytes associated with epileptic seizure foci. Dept. Neurobiology, The University of Washington, Seattle, WA, Host Phil Schwartzkroin (8/3/00).
- 2001 First Annual Dept. Neuroscience Chairs Meeting, "Properties that accompany the transition of glial cells to malignancy"
- 2001 Ion channels and amino acid transporters contribute to the invasive migration of human glioma cells. Department of Cell Biology, The University of Miami (9/14/01).
- 2001 Glial regulation of perisynaptic glutamate in health and disease. Ninth International Symposium on neural regeneration, Asilomar, CA (12/12-12/16/01).
- 2002 The role of glial glutamate transport in normal and diseased brain. Soc. Neurochemistry Annual Meeting, Palm Beach, FL (6/23/02).
- 2002 Neoplastic Astrocytes (Glioma); 2002 NIH workshop: Astrocyte Function in Health and Disease, National Institutes of Health, Bethesda MD (9/22-24/02).
- 2002 Cl^{-} channels and amino acid transporters contribute to the growth and invasion of primary brain tumors. Vanderbilt (10/11/02).
- 2003 Unique biological adaptations of invading glioma cells. Stanford University, Dept. Neurology, San Francisco. (1/7/03)
- 2003 Ion channels and amino acid transporters support the growth and invasion of human malignant gliomas. University of Colorado at Boulder (9/9/03).
- 2003 The role of Ion channels and amino acid transporters in growth control of human malignant gliomas. University of Colorado at Fort Collins (9/10/03).
- 2003 Malignant gliomas: perverting glutamate and ion homeostasis for selective advantage. University of Colorado Health Sciences Denver (9/11/03).
- 2004 The role of amino-acid transporters in growth control and invasion of human brain tumors. The University of Michigan, Minneapolis (9/10/04).
- 2004 University of Texas South Western, (Dallas) Ion channels and amino acid transporters support the growth and invasion of human malignant gliomas (12/14/04).
- 2005 Winter Conference on Brain Research, Symposium speaker, "Astrocytes and Disease", Breckenridge (01/24/05).
- 2005 Neurooncology Symposium, UAB Division of Pediatric Hematology & Oncology. "Targeting cystine transport as a novel way to treat primary brain tumors" (4/22/05).
- 2005 Ion channels and Amino acids support the growth and invasion of malignant brain tumors, Baylor College of Medicine; (6/9/05).
- 2005 Woods Hole Marine Biological Laboratories; Astrocytes and Brain Homeostasis. (8/9/05).
- 2005 University of Richmond, "Channels, amino-acid transport and tumor biology" (9/21/05).
- 2005 Drexel College of Med., "Biophysical changes that accompany the transition of glial cells

- to malignancy: (9/26/05).
- 2006 The Cleveland Clinic; Ion Channels and amino acids aid the biology of malignant gliomas. (4/10/06).
- 2006 Baylor College of Medicine; Biophysical adaptations that aid the unusual growth of primary brain tumors. (11/17/2006)
- 2007 Winter Conference on Brain Research; Ion channels involved in the growth and invasion of astrocyte-derived tumors, Snowmass, Colorado (1/31/2007).
- 2007 Gordon Conference on Glia; Ion channels & amino-acid transporters in the biology of glial-derived tumors; (3/14/07)
- 2007 Ion channels & amino-acid transporters support the growth and invasion of primary brain tumors, Harvard University; (3/26/2007)
- 2007 Astrocytes, Woods Hole Marine Biological Laboratories; (8/14/07).
- 2007 Cl⁻ and K⁺ channels promote cell volume changes that support the invasion of malignant brain tumors into normal brain, 6th International Symposium on Volume Regulation in Health and Disease; Salzburg, Austria (9/20/07)
- 2007 Yale University; Ion Channels & Amino-acid Transporters support the Growth and Invasion of Primary Brain Tumors, (10/17/2007)
- 2007 Role of ion channels in glioma invasion, International Meeting on Ion channels and Cancer, Castle Ringberg Max Planck Society; (11/25-28, 2007)
- 2007 Ion channel and amino-acid transporters support the growth and invasion of primary brain tumors, University of Nevada School of Medicine; (12/6/07)
- 2008 Ion channel and amino-acid transporters support the growth and invasion of primary brain tumors, University of Texas Health Science Center; (4/04/08)
- 2009 American Society for Neurochemistry, Annual Conference Speaker, "Role of system x_c⁻ in growth control of glial-derived primary brain tumors" (3/8/2009)
- 2009 American Society for Neurochemistry, "Role of neurotransmitter receptors in glioma invasion" (3/11/2009)
- 2009 Stanford School of Medicine, "New Treatments for primary brain tumors: ion channels and amino-acid transporters as drug targets" Host John Haganir (10/8/2009).
- 2010 University of Copenhagen, Dept Physiology. New treatments for primary brain tumors. Host Else Hoffmann (2/24/2010)
- 2010 Second meeting on Ion Channels in Cancer, Firenze Italy, "Role of ClC-3 and TRPC1 channels in the malignant transformation of primary brain tumors" (3/2/-3/6/2010)
- 2010 University of Washington, Seattle Dept. Pharmacology, "New treatments for primary brain tumors that target ion channels and amino acid transporters", Host Stella Nephi (5/18/2010)
- 2011 Virginia Tech, Carillion Medical Center,: "Glial derived brain tumors: unique biology and opportunities for novel treatments". Host Michael Friedlander (4/7/2011)
- 2011 Copenhagen, Denmark, Ion channels in Cancer (12/9/2011)
- 2012 Ion Channels in Cancer Meeting, "Hydrodynamic mechanism of cell invasion" Wuerzburg, Germany (9/12/2012)
- 2012 Neuro-Oncology Updates, Baltimore, "Glutamate Signaling and Glioma Biology" (9/20/2012)
- 2012 American Epilepsy Society, "Tumor associated epilepsy"(12/2/2012)
- 2013 Gordon Conference on Glia: "Glioma vascular interactions" (03/03-08/2013)
- 2013 University of Vermont, "Glioma vascular Interactions" Host Mark Nelson (6/13/2013)
- 2013 American Neurological Association, "Novel targets to treat Glioma" (10/15/2013)
- 2013 American Epilepsy Society, "Role of astrocytes in epilepsy" (12/8/2013)
- 2014 Virginia Tech 'A critical perspective on current and future approaches to the training of

- undergraduates in Neuroscience”. (8/28/2014)
- 2014 Virginia Tech, Carillion Medical Center: “Brain Tumors: a “Neurocentric” look at cancer. (8/29/2014)
- 2014 Penn State: “Primary Brain tumors from a Neuroscientists perspective”. (9/9/2014)
- 2015 Weil Cornell Medical School, “Gliomas alter glia-neuronal vascular interactions” (5/10/2015)
- 2015 University of Virginia, “Glioma: A Neurocentric Perspective on Brain Cancer (10/15/2015)
- 2015 University of Virginia, “Glia as drivers of Epilepsy”, Virginia Glial Symposium (12/3/2015)
- 2016 Wake Forest, Comprehensive Cancer Center, “Molecular changes that drive glioma genesis” (1/11/2016)
- 2016 Virginia Brain Rx Symposium, Richmond, “Chlorotoxin, a bench-to-bedside Story” (5/24/2016)
- 2016 VTCRI Center for Glial Biology biannual Conference. “Glutamate release from gliomas and its role in peritumoral epilepsy” (10/17/2016)
- 2017 Gordon Conference on Glial Biology, Ventura CA, “Glia as drivers of Epilepsy” (3/9/2017)
- 2018 Virginia Nordic (VNPN) Conference, Oslo, Norway. “Role of perineuronal nets in epilepsy” (9/18-21)

GRANT SUPPORT (PAST AND CURRENT)

1R01CA227149-01A1 (PI: Sontheimer) 12/01/2018 – 11/30/2023 1.81 cal mos
NIH-NCI \$1,814,840 Total Award

Regulation of Amino-Acid Transport in Human Gliomas

Glutamate (Glu) release from malignant brain tumors occurs via the system Xc transporter, causing excitotoxicity, edema, peritumoral seizures, enhanced tumor growth and tumor invasion. Its regulation by an important growth control gene frequently mutated in cancer is being studied to define a novel way for treatment and diagnosis.

Role: PI

W81XWH-15-2-0069 (PI: Sontheimer) 06/01/2018 – 05/31/2021 1.36 cal mos
Citizens United for Research in Epilepsy (CURE) (DOD flow-thru) \$2,632,252 Total Award

Vascular Injury, Gliosis & Neurogenesis as Drivers for Post-Traumatic Epilepsy

Generation of improved models that present with post-traumatic epilepsy (PTE), their validation and use to identify underlying biological changes, particularly focused on glia and vascular dysfunction, are the overarching goals of this proposal.

Role: PI

W81XWH-18-1-0521 (PI: VandeVord) 09/01/2018 – 08/31/2021 0.15 cal mos
DOD-CDMRP Epilepsy Research Program \$790,983 Total Award

Astrogliosis as the Driver for Post-Traumatic Epilepsy

The objective of this project is to capture and compare differences between blast TBI animals with seizure-confirmed PTEs and seizure-free blast TBI animals to provide a comprehensive and unbiased analysis of the molecular pathway(s) contributing to blast-related PTE.

Role: Co-Investigator

1R01AR075241-01A1 (PI: Gregus) 07/01/2019 – 05/31/2024 0.06 cal mos
NIH-NIAMS \$1,761,100 Total Award

15-LOX-1 as a druggable target in the acute to chronic pain transition of rheumatoid arthritis

This project seeks to understand the mechanisms underlying sensory and affective components of

chronic pain and interrogate 15-LOX-1 as a novel druggable target to impede activation of multiple downstream receptors in an alternative, non-opioid therapeutic strategy for treating arthritic pain states persisting after resolution of inflammation.

Role: Co-Investigator

1R01AG065836-01 (PI: Sontheimer) 03/01/2020 – 12/31/2024 1.81 cal mos

NIH-NIA

\$2,963,375 Total Award

Changes in cerebrovascular function with aging in normal and AD brain

This proposal examines the functional integrity and stability of the neurovascular unit, consisting of the endothelial cell, smooth muscle, pericyte and astrocyte, in the context of normal aging and Alzheimer disease (AD).

Role: PI

1R01NS036692-01A1 (PI: Sontheimer) 03/01/2020 – 11/30/2024 1.81 cal mos

NIH-NINDS

\$1,837,781 Total Award

Role of perineuronal nets in epilepsy

Epilepsy resulting from brain infection, tumors or injury present with tissue remodeling that employs protein degrading enzymes. These enzymes may damage “perineuronal nets,” an important protective coat around inhibitory neurons. The loss of this coat slows neuronal firing, making them less inhibitory and giving rise to seizures.

Role: PI

PENDING

1R01NS117593-01 (MPI: Jia, Sontheimer) 08/01/2020 – 07/31/2025 1.20 cal mos

NIH-NINDS

\$1,869,776 Total Requested

Spatially expandable fiber-based probes as multifunctional deep brain interface

Our primary goal for this proposal is to develop a minimally invasive, multifunctional, three-dimensional (3D) deep brain neural interface using spatially expandable fiber-based probes.

Role: Co-PI

Past

2016-2017 Wake Forest University SPORE/NIH “Disrupting Glutamate Release by Transcriptional Suppression of the Cystine Glutamate Transporter”

P.I. (annual \$70,000)

2005-2017 NIH RO1-NS052634 “Amino-acid transport and the biology of human gliomas”, **P.I.** (annual \$366,042)

2002-2015 P30HD38985 Kennedy Shriver Developmental Disabilities Research Center **Co-P.I.**, (PI Percy; total ~\$5.24Mio)

2013-2018 NIH-RO1-NS082851 “Glioma-Astrocyte Vascular Interactions” **P.I.** (annual \$321,563)

1994-2014 NIH-RO1 NS031234 “Properties and function of glial ion channels”, **P.I.**

1991-1994 NIH grant (RO1-NS27081) “Characterization and development of human seizure focus”, **Co-Investigator** (P.I. N. deLanerolle)

1993-1994 grant (IBN-9310277) "Modulation of ion channel expression and ion channel activity in astrocytes", **P.I.**

1994-2000 NIH-NICHD P50 -"NO in the development of synapses and myelination in cortex", **Co-Investigator** (P.I. M. Friedlander).

1997-2000 American Cancer Society RPG 97-083-01CCD -"A glioma specific chlorotoxin-binding protein in primary brain tumors", **P.I.**

2000-2003 American Cancer Society RPG 97-083-04CCD -" The use of Chlorotoxin to treat primary brain tumors , **P.I.**

1994-2000 NIH-NICHD P50 -"Excitotoxic mechanisms in developing rat neocortex", **Co-Investigator** (P.I. J. Hablitz).

1996-2000 AL Chapter for Parkinson's Disease -"The role of glial cells in Parkinson's Disease" **P.I.**

1997-2002 NIH RO1 NS36692 - "Properties of a glioma specific chloride channel", **P.I.**

2002-2008 NIH P50CA97247 BRAIN SPORE "Ion channels as novel, glioma-specific targets", **P.I.**

2000-2005 P30HD38985 UAB Mental Retardation Research Center; Simultaneous Laser Scanning Imaging and Electrophysiology Core, (P.I. Friedlander)

2000-2005 NIH PO1-HD38760 "The role of astrocytes in glutamatergic transmission in neonatal synapses", **P.I.** (current year total, \$151,230)

2004-2005 Goldhirsh Foundation. The role of amino-acid transport in the growth and invasion of astrocyte derived tumors, **P.I.** (\$100,000).

2009-2012 1P30NS069324-01 Center for Glial Biology in Medicine Research Recruitment Core Center, **P.I.** (\$651,250/year)

2015-2016 NIH 1R13NS092101-01 2015 Glial Biology: Functional Interactions among Glia & Neurons GRC & GRS **P.I.** (annual \$30,000)

2016-2017 Wake Forest University SPORE/NIH "Disrupting Glutamate Release by Transcriptional Suppression of the Cystine Glutamate Transporter **P.I.** (annual \$70,000)

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BOOKS

Diseases of the Nervous System, Harald W. Sontheimer, Elsevier 2015

This is a comprehensive single author book that provides a comprehensive review of the major neurological illnesses. Each of the 16 chapters encompasses clinical presentation, disease mechanisms, current and future treatment approaches, along with a historic background on disease often going back to ancient times. The text is primarily targeted at a college to pre-medical audience or medical students in their preclinical years.

The book was developed in conjunction with an undergraduate course using students enrolled in NEUR365 at Rhodes and NEUR433 at UAB as focus group. Detailed questionnaires provided comprehensive student feedback on content, presentation and accessibility of the material from the students. An academic physician who is a respected leader in the particular disease finally reviewed each chapter.

This text is self-contained to establish a college course and a complete slide set was generated for each lecture

DISEASES OF THE NERVOUS SYSTEM

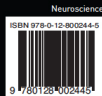
Harald Sontheimer University of Alabama Birmingham, Birmingham, AL, USA

The study of the brain continues to expand at a rapid pace providing fascinating insights into the basic mechanisms underlying nervous system illnesses. New tools, ranging from genome sequencing to non-invasive imaging, and research fueled by public and private investment in biomedical research has been transformative in our understanding of nervous system diseases and has led to an explosion of published primary research articles. *Diseases of the Nervous System* summarizes the current state of basic and clinical knowledge for the most common neurological and neuropsychiatric conditions. In a systematic progression, each chapter covers either a single disease or a group of related disorders ranging from static insults to primary and secondary progressive neurodegenerative diseases, neurodevelopmental illnesses, illnesses resulting from nervous system infection and neuropsychiatric conditions. Chapters follow a common format and are stand alone units, each covering disease history, clinical presentation, disease mechanisms and treatment protocols. Dr. Sontheimer also includes two chapters which discuss common concepts shared among the disorders and how new findings are being translated from the bench to the bedside. In a final chapter, he explains the most commonly used neuroscience jargon. The chapters address controversial issues in current day neuroscience research including translational research, drug discovery, ethical issues, and the promises of personalized medicine.

This book provides an introduction for course adoption and an introductory tutorial for students, scholars, researchers and medical professionals interested in learning the state of the art concerning our understanding and treatment of diseases of the nervous system.

Key Features

- A focused tutorial introduction to the core diseases of the nervous system
- Includes comprehensive introductions to stroke, epilepsy, Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis, head and spinal cord trauma, multiple sclerosis, brain tumors, depression and schizophrenia and many other diseases of the nervous system
- Covers over 40 diseases from the foundational science to the best treatment protocols



DISEASES OF THE NERVOUS SYSTEM

Harald Sontheimer



THIS BOOK WON THE 2016 PROSE AWARD FOR BEST SCIENTIFIC TEXTBOOK

Books and Book Chapters

1. Kettenmann, H., Backus, K.H., Berger, T.B., Sontheimer, H., and Schachner, M.: Neurotransmitter receptors linked to ionic channels in cultured astrocytes: An electrophysiological approach. Differentiation and Functions of Glial cells, 203-211, Alan R. Liss. (1990).
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Teaching Responsibilities:

Course Master:

- NEUR1004 Virginia Tech, Neuroscience Orientation Seminar (1 credit)
- NEUR4034 Virginia Tech, Diseases of the Nervous System (3 credits)
- NEUR4594 Virginia Tech, Clinical Neuroscience in Practice (3 credits)
- NEUR4044 Virginia Tech, Neuroscience of the Mind, Senior Seminar (3 credits)

- NBL433/PH433 UAB “Diseases of the Nervous System” (3 credits)
- NBL399 “Senior Seminar” Course for honors students to do paper based scientific review and write a research based honors thesis (3 credits)
- NBL-433 Diseases of the Nervous System, 2010-2013, 3 credit hours
(undergraduate honors course, 50% didactic 50% student initiated)
- GBS-733 Neurobiology of Disease, 1995-present 3 credit hours
(advanced graduate course that familiarizes students with current knowledge in 16 of the most well studied disorders of the nervous system from both a clinical and basic science perspective).
- NBL-788 Biology of Glia, 2005-present
- NEUR365 Rhodes College, Memphis, Diseases of the Nervous System (4 credits)
- NEUR486 Rhodes College, Senior Seminar (4 credits)
- NEUR452 Rhodes College, Research in Neuroscience (2 credits)
(year-round journal club)
- Laboratory Methods, NEUR 753, 07/29-08/09/96, 97, Course Director
(“Woods-Hole”-style integrative course that combines hands-on laboratory experiments with in-depth discussion of background materials. Familiarizes students with state-of-the-art electrophysiological and optical recording techniques).
- Cellular and Molecular Neurobiology-Module III, NEUR 702, 11/15-12/20/96

Lecturer:

- Cellular and Molecular Neuroscience, NEUR702, 1994-2015
- Current Topics in Neuroscience Research, NEUR781, 01/01-2015
- Medical Neuroscience Course, NBL 711, Spring 1995-2015
- Developmental Neuroscience, NEUR 720-00, Spring 1995-99
- Integrative Biological Sciences, 2000-2015

Graduate Students and Fellows Supervised:

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- Chloe Thio, M.D. Thesis advisor, 1992-1993, Yale University School of Medicine.
- Karen Rosewater, M.D. Thesis advisor, 1993-1994, Yale University School of Medicine.
- Nicole Ullrich, Ph.D. 1993-1997 Ph.D. thesis advisor, Yale MSTP program

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Liliana Soroceanu, 1997-1999, Ph.D., thesis advisor, UAB Neurobiology
Stacey MacFarlane, 1994-1999; Ph.D. thesis advisor, UAB Neurobiology
Christopher B. Ransom, 1994-2001; Ph.D. thesis advisor, UAB MSTP (MD. Ph.D.) Program
Xiaojin Liu, 1998-2002, Ph.D., thesis advisor, UAB Neurobiology
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Inventions and Patents

- 1.) “Novel method of diagnosing and treating gliomas”, US# 60/009,283 U.S. patent application filed on 12/27/95, patent issued 4/01/98 docking # FY96-0021,.
- 2.) “Agonists of Metabotropic Glutamate Receptors and Uses Thereof”, US#6,013,672 Application # 08/993,760, patent issued 01/11/00.
- 3.) “Uses of phenylglycine derivatives”, D6177, patent issued 3,6,2001 US#6,197,820
- 4.) “Diagnosis and treatment of neuroectodermal tumors”, D6218, patent application pending, filed 5/27/99. PCT/US2000/010453, issued, 4/19/2000.
- 5.) “Chlorotoxin inhibition of cell invasion, cancer metastasis, angiogenesis and tissue remodeling”, D6410, filed 06/26/2001.
- 6.) Cloning and characterization of a novel bk channel isoform, PCT/US2003/005963, Filed Jun 26, 2002.
- 7.) Modulation of cellular migration, filed Mar 30, 2012.