

CURRICULUM VITAE

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Education

1969-1973 B.S. American University, Washington, D.C. Major: Biology
1973-1975 Foundation for Advanced Education in the Sciences at NIH: Evening classes
in Advanced Organic Chemistry, Mathematics, and Neurochemistry
1975-1980 Ph.D. Department of Pharmacology Georgetown University School of
Medicine, Washington, D.C. Thesis: GABA-elevating agents and seizures.

Employment and Training

1972-1973: Laboratory Research Technician, Section on Molecular Virology, Laboratory of Viral
Diseases, National Institute of Allergy and Infectious Diseases, NIH
1973-1974: Laboratory Research Technician, Research Staff, Neurobiology Department,
Neurochemistry Section, Armed Forces Radiobiology Research Institute. National
Naval Medical Center, Bethesda, MD
1974-1976: Laboratory Research Technician, Research Staff, Neurobiology and Anesthesiology
Branch, National Institute of Dental Research, NIH
1975-1980: Graduate Student, Department of Pharmacology, Georgetown University School of
Medicine, Washington, D.C
1980-1982: Research Pharmacologist, Duke-VA Neurology Research Laboratories, Veteran's
Administration Medical Center, Durham, North Carolina

1982-1984: Pharmacology Research Associate, Laboratory of Preclinical Pharmacology,
National Institute of Mental Health, NIH
1984-1986: Staff Fellow, Laboratory of Preclinical Pharmacology, National Institute of Mental
Health, NIH
1986-1989: Senior Staff Fellow, Neurobiology and Anesthesiology Branch, National Institute of
Dental Research, NIH
1989-1992: Research Pharmacologist, Neural Mechanisms and Tissue Injury Section,
Neurobiology & Anesthesiology Branch, National Institute of Dental Research, NIH
1992-1996: Chief, Neuronal Gene Expression Unit, Pain and Neurosensory Mechanisms
Branch, National Institute of Dental and Craniofacial Research, NIH
1996-2005: Chief, Neuronal Gene Expression Section, Pain and Neurosensory Mechanisms
Branch, National Institute of Dental and Craniofacial Research, NIH
2005-2013: Chief, Neurobiology and Pain Therapeutics Section, Laboratory of Sensory Biology,
National Institute of Dental and Craniofacial Research, NIH
2013-Present: Senior Research Scientist, Department of Perioperative Medicine, Clinical
Center, NIH

Teaching and Professional Activities

1977-1979: Lecturer in General Pharmacology and Critical Care Nursing, Georgetown

University School of Nursing, Continuing Education Program

1977-1979: Lecturer in General Pharmacology, Continuing Education for Nurses, Montgomery College, Community Services, Montgomery County, Maryland

1977-1979: Lecturer, Pharmacology, Georgetown University School of Medicine, Washington, DC

1981: Assistant Instructor, In Vitro Mammalian Brain Slice Workshop, Cold Spring Harbor, NY

1987: Ad Hoc Member, Neurology-A Study Section, NINCDS.

1987 - present: Reviewer for various journals: Neuron, Brain Research, Biochemical Pharmacology, Peptides, Neuropharmacology, Pain, J. of Pain, J. Clinical Investigation, STM, etc.

1990: Ad Hoc Member, RCDA Review Committee (MHK), NIMH.

1991: NIDA Technical Review: Activation of Immediate-Early Genes by Drugs of Abuse, June 3-4.

1991: Ad Hoc Member, NIDA Special Review Committee, December 1991

1991: Small Grant Application Review Panel, NIDR, November 1991

1992 - 1997: Ad Hoc Member, Molecular, Cellular and Developmental Neurobiology (MCDN) Review Committee, NIMH, January 1992; June 1993; February 1994 and 1997

1995 - 1997: Ad Hoc Reviewer, National Institute of Standards and Technology ATP Awards Program

1996: Instructor, Advanced Course in Molecular Biology and Signal Transduction, International Association for the Study of Pain, 8th World Congress on Pain, Vancouver, Canada, August 1996

1998: NIH Clinical Center Revitalization Plan, Member of Ad Hoc Committee for Basic Science - Clinical Science Interactions

1998-2013: Member of NIDCR Animal Care and Use Committee (15 years)

1998: External Reviewer, VA Medical Research Program, Department of Veterans Affairs.

1998 - 2003: Instructor "Positron Emission Tomography: Principles and Applications" Foundation for Advanced Education in the Sciences, NIH, Fall Semester

1999 - 2005: NIDCR Liaison to Office of Recombinant DNA Activities, Recombinant DNA Advisory Committee (RAC) & Human Gene Therapy Protocol Reviews

2002 - 2003: NIDCR Committee on Development of Scientific Initiatives

2002 - 2003: Scientific Advisory Board, Descartes Therapeutics, Inc., Woburn, MA

2003 - 2013: Member, NIH Inter-Institute Pain Consortium

2005 - 2013: Co-founder and Institute Representative: Neural Cell Function Interest Group, a NIH-wide Scientific Interest Group

2006 - 2013: Director, NIH-wide Pain Interest Group. I was the lead contact and organized monthly meetings of the NIH Pain Community involving outside speakers or local researchers

2006: Reviewer for NINDS Steps to Independence K99/R00 Grant Review Committee

2007 - 2009: Member Steering Committee for NIH Inter-Institute Center for Human Immunology

2007 - 2010: Lecturer, Pain Mechanisms and Pain Management, Medical Neurobiology Course, Georgetown University Medical School

2007: Reviewer for NIDA Special Emphasis Panel P20 Center Grant Awards, July 2007,

2008: Ad Hoc NIH Roadmap Planning Sub-Committee for NIH Pain Consortium (Jan-April)

2008: Reviewer for NIDA Special Emphasis Panel P20 Center Grant Awards, July 2008

2008 - 2013: NCI Symptom Control & Quality of Life Committee, Drug Development Task Force

2009: NIH Transformational Grant Program Reviews, April 2009

2009: NIH Molecular and Cellular Neurobiology Grant review panel, December 2009

2009: NIH Planning Committee for NIH Pain Consortium Meeting (Jan-April).

2009: NIH Earl Stadtman Tenure Track Investigators Review, Neurobiology Subcommittee December 2009

2010: Planning Committee for NIH Pain Consortium Meeting (January - April).

2010: Center review for Non-NIH Institution. April 2010

2010: Trans-NIH Working Group on Opioids and Chronic Pain in Older Adults. March 2010

2010: Search Committee, Tenure Track Scientist Recruitment, National Institute of Nursing Research, NIH, August-November 2010

2010: Search Committee, Chairperson, Department of Anesthesiology and Surgical Services, Clinical Center, NIH, August 2010 – January 2012

2011: Planning Committee for NIH Pain Consortium Meeting (January - April)

2012: Selection Committee, NIH Neuroscience Seminar Series. Cell Biology Subcommittee

2012: Planning Committee for NIH Pain Consortium Meeting (January - April)

2012: Grant Review Panel. Defense Medical Research and Development Program: Pain Management, Panels 1 and 2, Department of Defense, November 2012

2014: Review Committee, American Pain Society: 2015 Annual Awards Candidate Evaluations

2014: VA Scientific Merit Review panel. Rehabilitation Research and Development Service (RRD2) Musculoskeletal/Orthopaedic Rehabilitation, August 2014

2015: VA Scientific Merit Review panel. Rehabilitation Research and Development Service (RRD2) Musculoskeletal/Orthopaedic Rehabilitation, February 2015

2015-2016: Lecturer: "Transitioning from Pre-clinical to First-in-Human Phase I Studies," Clinical and Translational Research Course for Ph.D. Students. Foundation for Advanced Education in the Sciences, NIH. July 2015, 2016

2015-2016: Biotechnology and Biological Sciences Research Council (BBSRC), United Kingdom, Grant Reviews: Super Fund follow on programs

2016: Grant Review Panel: US Army Medical Research and Material Command Clinical and Rehabilitative Medicine. May 2016

2016: Grant Review Panel: US Army Medical Research and Material Command Clinical and Rehabilitative Medicine. July 2016

2016: Invited participant. Workshop on Human Brain Projects and Public Health. World Health Organization Headquarters, Geneva, Switzerland July 2016

2016-2017: Peer Reviewed Medical Research Program, Congressionally Directed Medical Research Program, Department of Defense. Several rounds of individual grant proposals and Focused Program Proposals in Pain Medicine

2017: Grant Review Panel, Pain Medicine Subsection, Congressionally Directed Medical Research Program, Department of Defense. August 2017

2017 - Present: Scientific Advisory Board: Ark Animal Health, San Diego CA

2018: "Emerging Techniques in Basic Science and Translation," PAIN 2018 Refresher Course, International Association for the Study of Pain 17th World Congress on Pain, Boston, MA, September 2018. Organizer and instructor.

2018: Discovery and Validation of Biomarkers to Develop Non-Addictive Therapeutics for Pain. Bethesda MD, Nov 2018

2019: Natural Products and Pain: The search for novel non-opioid analgesics. NIH, Bethesda MD, February, 2019

2019: Workshop "The Human DRG, TG & Spinal Cord Consortium: A translational bridge for pain & migraine therapeutic discovery", University Texas, Dallas, TX, August 2019.

2020: Grant Review, HEAL Initiative, National Center for Advancing Translational Research, March 2020

2020: Resident Interviews for Neurological Surgery Program, Surgical Neurology Branch, NINDS, NIH, November-December 2020

2021: Member, Nominating Committee, US Association for the Study of Pain (USASP) March 2021-2024

2021: "Targeted Toxins: Capsaicin and Resiniferatoxin," 2021 NC Veterinary Pain Virtual Short Course, NC State Comparative Pain Research and Education Center. April 2021

- 2022: "Preclinical Research for a New Analgesic Agent" Board of Scientific Councilors Meeting
Clinical Center, NIH, Bethesda MD, March 2022
- 2022: Invited Speaker "The Critical Cells for Pain and Pain Control," Tackling Pain at NIH:
Updates from the Bench, Clinic and New NIH Pain Research Center. Bethesda
MD, March 2022
- 2022: Grant Review Panel, HEAL Initiative Grants on Human Precision Pain Network, June 2022.
- 2022: Grant Review Panel, Pain Medicine Subsection, Congressionally Directed Medical
Research Program, Department of Defense. December, 2022
- 2023: Grant Review Panel, HEAL Initiative Grants on Human Precision Pain Network, May 2023

Honors, Awards, and Grants

- Grass Foundation Fellowship in Neurophysiology, Marine Biological Laboratory, Woods Hole,
Massachusetts, 1979.
- NIH Postdoctoral Fellow, 1981-1982.
- Pharmacology Research Associate, National Institute of General Medical Sciences, 1982-1984.
- Scottish Rite Schizophrenia Research Award, 1981-1982.
- Pfizer Traveling Fellow, Clinical Research Institute of Montreal, Montreal Canada, 1993.
- National Institute of Drug Abuse Research Award, 1990-1991. "Proto-oncogene activation and drugs
of abuse".
- Emerging Scientific Opportunities Fund, 1997-1999. An NIDCR externally reviewed intramural competitive
award program.
- Bench-to-Bedside Initiative Award, NIH, 1998-1999. Competitive intramural NIH award to promote
translational research. "Gene Therapy for Control of Chronic Cancer and Arthritic Pain".
- Bench-to-Bedside Initiative Award, NIH, 2001-2002. Competitive award of NIH intramural funds to
promote translational research. "New Treatments for Intractable Pain," To provide initial support of
the RTX clinical trial.
- Emerging Scientific Opportunities Fund Award, 2001-2002. An NIDCR externally reviewed intramural
competitive award program.
- SBIR Grant R43DE015731-01A2 with Lasmed, LLC, 2006-2008. Phase I Development of an infra-red
diode laser for pain testing.
- Bench-to-Bedside Initiative Award, NIH, 2007-2008. "Humoral Response Profiling of Viral and Cellular
Tumor Antigens for Predicting, Diagnosing and Monitoring HIV Malignancies," (Associate
Investigator).
- Bench to Bedside Initiative Award, NIH, 2009-2010. "A Rapid Diagnostic Test for Latent Tuberculosis
Infection." (Associate Investigator).
- Center for Neuroscience and Regenerative Medicine, Uniformed Services University of the Health
Sciences, Department of Defense, 2009-2011. Biomarkers Subsection, "Neuro-Glial Antibodies in
Traumatic Brain Injury." Principal Investigator.
- Cooperative Research and Development Agreement (CRADA) 2009-2012. Consortium of NIDCR,
NINDS and Sherrington Pharmaceuticals. To implement clinical trials of resiniferatoxin for
treatment of cancer and post-herpetic neuralgia pain.
- NIH Director's Award, 2009. RTX Development Project, Category: Scientific/Medical. Citation: "For
advancing resiniferatoxin to a successful IND approval, enabling its evaluation in clinical trials as
a treatment for intractable pain."
- Molecular Libraries Screening Grant, 1 R03 MH089480, "HTS for Identifying Allosteric Modulators of
the TRPV1 receptor." 2010-2011. To establish an assay and screen the NIH Molecular Chemical
Library
- NIH Center for Complementary and Alternative Medicine: "Pain Transcriptome Grant." 2011-2013. To
initiate next generation RNA-sequencing to study transcript levels, exon structure, alternative
splicing, and micro RNAs in acute and chronic pain.

Frederick W. L. Kerr Basic Science Research Award, American Pain Society, May 2014. “The award recognizes individual excellence and achievements in pain scholarship and is presented to a pain professional whose total career achievements have made outstanding contributions to the field of pain research.”

Cooperative Research and Development Agreement (CRADA) 2017-2018. Consortium of Clinical Center, NINDS and Sorrento Therapeutics. To conduct clinical trials of resiniferatoxin for treatment of cancer pain.

Behavior and Social Sciences Research Program: “Molecular Foundations of Human Pain” and “Interventional Pain Control and its Impact on Psychological and Behavioral Functions,” 2017-2019. To explore transcriptomics of human pain circuits and conduct clinical trials on human pain problems with molecular interventions aimed at peripheral nociceptive targets.

Bench-to-Bedside Award, NIH, 2020-2021. “New non-opioid treatment for surgical pain,” Funding for a Phase I Clinical Trial of resiniferatoxin to control pain from surgical incisions and drain tubes.

Bench to Bedside Award, NIH, 2023-2024. “Kinetics and target engagement for a Phase II trial of resiniferatoxin for cancer pain,” Funding to develop advanced pain management and measurement techniques to treat intractable pain in patients with advanced cancer.

Professional Societies

United States Association for the Study of Pain

Society for Neuroscience

International Association for the Study of Pain

American College of Neuropsychopharmacology (Fellow)

American Society for Pharmacology and Experimental Therapeutics

Institutional Committees

Positron Emission Tomography Steering Committee, Department of Nuclear Medicine, Clinical Center, NIH (1993-2002)

In Vivo NMR Center Steering Committee, Clinical Center, NIH (1994-1997)

NIDCR Laboratory Safety Committee (1988-1993)

NIDCR Visiting Scholars Seminar Committee (Chairman)(1988-1990)

NIDCR Institutional Animal Care and Use Committee (1991-1993)

NIDCR Gene Targeting Facility Users Committee (1993-2013)

NIDCR Automated DNA Sequencing Core Facility Users Committee (1993-2013)

NIDCR Summer Student Program Committee (1994-2004)

NIDCR Administrative Oversight Committee (1995-2013)

NIDCR, NIMH, NINR Tenure Track and Staff Scientist Review Committees. These are Ad Hoc committees for evaluation of personnel staff positions or recruitment of new staff to tenure track positions (N=14, 1998-2013).

NIDCR Institutional Animal Care and Use Committee (1998-2013).

NINDS Neuroscience Seminar Series Planning Committee. (2003-2013 and still affiliated).

NIH-wide Pain Interest Group. Director: 2006-2013. As the director of this Scientific Interest Group, I organized monthly meetings of the NIH pain community generally including seminars delivered by outside speakers or local researchers. I transferred the chairmanship in 2013.

NIH-wide RNA-Seq Interest Group. Co-Director: 2013-present. I am one of the founders of this Scientific Interest Group. Both intramural and external speakers are invitees to the SIG.

Animal Research Committee, American College of Neuropsychopharmacology, Sept. 2022 to present.

Clinical Center Scientific Review Committee for the CC ACUC, February 2023-present.

Patents and Employee Invention Reports (EIRs)

De Costa BR, Iadarola MJ, Berman KF, Rothman RR and Rice KC: Radiolabeled N-substituted-6-iodo-3,14-dihydroxy-4,5.alpha.-epoxymorphinans. U.S. Patent # 5,208,338. May,1994. This patent covers an iodinated naltrexone derivatives for SPECT imaging of opioid receptors.

De Costa BR, Iadarola MJ, Berman KF, Rothman RR, and Rice KC: Radiolabeled n-substituted-6-iodo-3,14-dihydroxy-4,5.alpha.-epoxymorphinans, intermediates for producing the same, and a process for the preparation and methods for detecting opiate receptors. U.S. Patent # 5,336,483. August, 1994.

Iadarola MJ, Caudle RM, Finegold AA and Mannes AJ: Methods for Treating Chronic Pain. U.S. Patent # 6,596 269, issued July, 2003. This patent concerns our gene therapy "paracrine paradigm" for pain control (see references 109, 114 and 117).

FitzGerald DJ and Iadarola MJ: Novel disulfide conjugated cell toxins and methods of making and using them. U.S. Patent # 6,881,718, issued April, 2005. This patent application covers the Substance-P-Pseudomonas exotoxin conjugate, associated chemistry and uses that we developed to delete cells via agonist-mediated receptor endocytosis.

Iadarola MJ, Karai L and Olah Z: Selective ablation of pain-sensing neurons by administration of a vanilloid agonist. U.S. Patent # 8,338,457, issued December, 2012. This patent covers the use of vanilloid agonists to control pain via intrathecal and intraganglionic administration (see references 126, 145 and 149).

Burbelo PD, Marquez A, Iadarola MJ: Compositions and methods for screening for Lyme disease. U.S. Patent # 8,926,989, issued January, 2015 (see reference 184).

Burbelo PD, Kovacs J, Iadarola MJ: Serological screening for HHV-8 infection using antigen mixtures. U.S. Patent # 8,951,723, issued February, 2015 (see reference 176)

Iadarola MJ, Mannes AJ, Grimes G, Park M, Potti G: Long-term Stability of Resiniferatoxin Formulations for Human and Veterinary Use. EIR 2008.

Iadarola MJ, Roh E-J, Keller JM, Karai L, Olah Z, Jacobson KA: Allosteric potentiators of transient receptor potential V1 (TRPV1) for analgesia. EIR, 2008.

Ching K, Burbelo PD, Iadarola MJ. Detection of autoantibodies to the nicotinic acetylcholine receptor (nAChR) using recombinant alpha-bungarotoxin by Luciferase Immunoprecipitation Systems (LIPS), EIR Sept. 2009

Iadarola MJ, Mannes AJ, Keller JM, Mitchell K, Bates BD: Long-acting ophthalmic analgesic eye drops. Provisional Patent filed, 2009.

Iadarola MJ, Sapio MR, Mannes AJ: Analgesia by selective genetic suppression of nociceptive transmission. EIR filed July 2015.

Iadarola MJ, Sapio MR, Mannes AJ: Specific tyrosine kinase inhibitors as analgesic agents. EIR filed July 2016.

Mannes AJ, Sapio MR, Goto T, Iadarola MJ: New peptide involved in surgical incision repair. EIR filed March 2020.

Sapio, MR, King DM, Iadarola MJ, Mannes AJ: Efficient removal of human-derived autofluorescent lipofuscin through the use of high intensity white light. Patent review in progress, 2024.

Clinical Protocols

Principal Investigator: "Somatosensory Studies of Pain and Pain Control Measured with Oxygen-15 Water Positron Emission Tomography and Functional MRI in Normals and patients with Neuropathic or Chronic Pain Conditions," Clinical Protocol # 92-D-0243, August 1992 to 2005.

Associate Investigator: "Effects of Analgesic Medication on Post-surgical Pain," Clinical Protocol # 91-D-0218, August 1999 to 2005.

Principal Co-Investigator: "Genetics of Pain," Clinical Protocol # 00-D-0055. January 2000 to 2005.

Associate Investigator: "Evaluation of Vanilloid Receptor Inactivation for Preemptive Analgesia," Clinical Protocol # 01-D-0056. May 2001-2005.

Associate Investigator: "Complex Regional Pain Syndrome Proteomics Study," Clinical Protocol # 02-D-0169. December 2001-2013.

Associate Investigator: "Clinical and Laboratory Evaluation of The Autonomic Nervous System in Primary Sjögren's Syndrome," NIDCR #08-D0018, August 2007-July 2012.

Associate Investigator: "WAGR Syndrome and other 11p contiguous gene deletions: clinical characterization and correlation with genotype," NICHD #08-CH-0213, November 2008-2013.

Associate Investigator: "A Phase I Study of the Intrathecal Administration of Resiniferatoxin for Treating Severe Refractory Pain Associated with Advanced Cancer," NIDCR, #09-D-0039, November 2008-May, 2012. <http://clinicaltrials.gov/ct2/show/NCT00804154>

Associate Investigator: "A single cohort study collecting interval timed incisional epidermal and dermal tissue samples during surgical procedures to profile temporal response of tissue after noxious stimuli. NIH Clinical Center Protocol #: 20CC0031. December 2019-present.

Associate Investigator: "Phase I Randomized, double-blind clinical trial using Resiniferatoxin, a non-opioid medication, for the management of surgical incision pain. FDA toxicology studies needed for this Protocol; October 2020.

Associate Investigator: Phase I Study of Resiniferatoxin to Treat Oral Mucositis Lesions in GVH Patients and after Irradiation for Head and Neck Cancer. Protocol in preparation, May 2022.

Associate Investigator: "Phase I Randomized, double-blind clinical trial using Resiniferatoxin, a non-opioid medication, for the management neuroma pain. IND Approved, NIH Clinical Center Protocol Approved. About to recruit, October 2023.

Associate Investigator: "Clinical and Scientific Assessment of Pain and Painful Disorders". NCCIH Clinical protocol, IRB #16AT0077, October 2023.

Invited Lectures, Presentations, Symposia, Workshops, and Focus Panels (2011 and Forward)

Invited Speaker: "Autoantibody Biomarkers for Traumatic Brain Injury," Plenary presentation, Center for Neuroscience and Regenerative Medicine Annual Retreat, April 2011.

Invited Speaker: "Approaches to Analgesia involving TRPV1 agonists and allosteric modulators," NIH Pain Consortium Annual Spring meeting. April 2011.

Invited Speaker: "Antagonists, agonists and allosteric modulators of TRPV1," Drug Development Task Force, NCI Symptom Control and Quality of Life Committee, April 2011.

Invited Speaker: "New approaches to pain control using agonists and allosteric modulators of TRPV1, a key peripheral integrator of pain and inflammation," NIH-wide Translational Research Interest Group. May 2011.

Invited participant: NINDS Workshop: Advancing Translational Headache Research, June 2011.

Invited Speaker: "Approaches to pain control using TRPV1, a heat, inflammation, and capsaicin activated ion channel," Blaustein Lecture Series, Dept. of Anesthesiology, Johns Hopkins University School of Medicine, June 2011.

Invited Speaker: "Pain Control: from the stage of a microscope to a Phase I clinical trial and the translational research process." Keynote speaker at the 14th Annual Neuroscience Retreat, University of Maryland. June 2011.

Invited participant: Chemotherapy-Induced Peripheral Neuropathy (CIPN) Workshop, Division of Cancer Prevention, National Cancer Institute, June 2011.

Participant: 1st Scientific Workshop Analgesic Clinical Trial Innovations, Opportunities, and Networks (ACTION): An FDA Public-Private Partnership, June 2011.

Invited Speaker: "Localized interventions for trigger zones." NICHD workshop: "Vulvodynia: Setting a Research Agenda." July 2011.

Invited Participant: "Pathways Toward Evidence-Based, Personalized Analgesic Medication," NIDA Workshop, September 2011.

Invited Speaker: "TRPV1 agonists as pain therapeutics," Topical Seminar, 6th World Congress of the World Institute of Pain, Miami, Florida, February 2012.

Invited Speaker: "HTS screening for TRPV1 positive allosteric modulators and Pain transcriptome analysis using RNA-Seq" NIDCR Principal Investigator Seminar Series, April 2012

Invited Speaker: "Multiple pathways for pain control using TRPV1 ion channel agonists and positive allosteric modulators," 2012 Ion Channel Retreat. Vancouver, Canada, June 2012.

Invited Speaker: "TRPV1 Agonists and Positive Allosteric Modulators: an interventional approach to personalized pain medicine" Abbott Laboratories, Chicago IL, June 2012.

Invited Speaker: "TRPV1 agonists, positive allosteric modulators, and pain transcriptome analysis using RNA-seq" Department of Pharmacology, Georgetown University Washington DC, September 2012.

Invited Speaker: "The TRPV1 Sensory Neuron: Pharmacology and Transcriptomics." Laboratory of Molecular Physiology, NIAAA, NIH, Rockville, MD, September 2012.

Chairperson, SfN Nanosymposium, "Neuropathic Pain: Mechanisms and Models," and Speaker: "RNA-Seq analysis of DRG neuronal subpopulations: Insights into the "nociceptome" and axotomy-induced gene expression." Society for Neuroscience Annual Meeting, New Orleans LA, October 2012.

Invited Speaker, "Screening for TRPV1 positive allosteric modulators: A route to new analgesic agents." 7th Assay and Drug discovery Technologies Conference, Philadelphia, PA, October 2012.

Invited Speaker, "RNA-Seq for transcriptome analysis of pain circuits." NIH-wide Pain Interest Group, Bethesda, MD, January 2013.

Invited Speaker, "TRPV1 agonists, allosteric modulators and TRPV1 transcriptomics. MD Anderson Cancer Center, Houston TX, April 2013.

Chairperson & Organizer & Speaker: Symposium "Profiling the Pain Transcriptome with RNA-seq." American Pain Society, New Orleans, LA, May 2013.

Chairperson & organizer: Symposium "Pain, Itch and Touch Sensations: Neurons, Circuits, and Genes," American Pain Society, New Orleans, LA, May 2013.

Invited speaker, "TRPV1 Agonists and Allosteric Modulators for Pain Control," Seventh Annual Pain Therapeutics Summit East, Boston MA, September 2013.

Invited Speaker, "Drug development for pain control using the TRPV1 ion channel, a multifunctional receptor for painful heat, inflammation, and capsaicin, the "hot" molecule in hot pepper," Department of Chemistry, American University, Washington, DC, October 2013.

Invited speaker, "TRPV1 Agonists and Allosteric Modulators for Pain Control," Seventh Annual Pain Therapeutics Summit West, San Diego, CA, November 2013.

Award Presentation: "TRPV1 Therapeutics and Transcriptomics." Fredrick W.L. Kerr Basic Science Research Award Lecture, American Pain Society, Tampa, FL April 2014.

Invited Speaker: "TRPV1 Transcriptomics and Therapeutics" NIH Research Festival Symposium: "Moving molecules from model systems to medicine in pain research" NIH, Bethesda MD, September 2014.

Invited Speaker: "Pain and Nerve Injury Transcriptomics," NIH-wide RNA-Seq Interest Group, Bethesda MD, November 2014.

Invited Speaker: "RNA-Seq Studies of Pain and Nerve Injury." Illumina Users Group Meeting, Bethesda, MD, December 2014.

Invited Speaker: "Pain Circuits, Neurochemistry and Molecular Biology." Sickle Cell Anemia Branch, NIDDK, NIH, February 2015.

Chairperson & co-organizer: Symposium: "Un-mixing the transcriptional responses of sensory neurons in partial injuries," American Pain Society, Palm Springs, CA, May 2015.

Invited Speaker: "Pain transcriptomics and therapeutics," International Conference on Pain Medicine, Chicago IL, June 2015.

Invited Speaker: "Transitioning from pre-clinical to first-in-human Phase I studies," Clinical and Translational Research Course for Ph.D. students. Foundation for Advanced Education in the Sciences, NIH. July 2015.

Invited Speaker: "TRPV1 and RTX: the next set of clinical studies," Division of Pharmacotherapies and Medical Consequences of Drug Abuse. National Institute of Drug Abuse, August 2015.

Invited Speaker: "TRPV1 Neurons: Therapeutic Agonist Actions and RNA-Seq Transcriptomics," Neuroscience Research Seminar Series at Indiana University School of Medicine, Indianapolis IN, September 2015.

Invited Speaker: "Pain Research Frontiers," Department of Perioperative Medicine. Clinical Center, National Institutes of Health, September 2015.

Invited Speaker: "Transcriptomics of Pain," 9th International Pain and Migraine Summit, Washington DC, September 2015.

Invited Speaker: "Pain research mechanisms related to pain control," Department of Laboratory Medicine, Clinical Center, NIH, November 4, 2015.

Invited Speaker: "Translational Transcriptomics of Nociceptive Circuits," University of Louisville, School of Medicine^[SEP], Department of Anatomical Sciences and Neurobiology, Louisville KY, November 12, 2015.

Invited Speaker: "Next-gen Sequencing for Next-Gen Pain Research." Symposium: "Big Data on Nociceptive Afferents," American Pain Society, Austin TX, May 2016.

Invited Speaker: "Translating from Molecules to Small and Large Animal Models," presented at "A 'Town-Hall' Discussion of the Translatability of Current Behavioral Pain Models." American Pain Society, Austin TX, May 2016.

Invited Speaker: "Transitioning from pre-clinical to first-in-human Phase I studies," Clinical and Translational Research Course for Ph.D. students. Foundation for Advanced Education in the Sciences, NIH. July 2016.

Invited Speaker: "RNA-Seq insights into pain, inherited neuropathies, and the druggable nociceptome." National Institutes Sequencing Center, National Human Genome Institute, May 2017.

Invited speaker: "Resiniferatoxin for Treatment of Malignant Pain and Other New Developments," American Society for Regional Anesthesia, Orlando, FL, November 2017.

Invited speaker: "What Can Next-Gen Sequencing Tell us about Pain and the Opioid Crisis," American Society for Regional Anesthesia, Orlando, FL, November 2017.

Invited speaker: Refresher Course at the International Association for the Study of Pain 17th World Congress on Pain, Boston, MA, September 2018.

Invited Speaker: "Evaluation of a New Interventional Treatment for Osteoarthritis," Community Engagement Studio Demonstration for "NCATS Day," National Center for Advancing Translational Science, NIH, October 2018.

Invited Speaker: "PET Imaging as a Biomarker for Target Engagement," Workshop: Discovery & Validation of Biomarkers to Develop Non-Addictive Therapeutics for Pain. Washington DC, Nov 2018.

Invited Speaker: "Cactus-like plant, Resiniferatoxin, and Pain," Workshop: Natural Products and Pain: The search for novel non-opioid analgesics. NIH, Bethesda MD, February 2019.

Invited Speaker: "2nd Generation non-opioid analgesic drugs," Division of Pre-Clinical Innovation, NCATS, NIH, February 2019.

Invited participant: "Trigeminal Neuralgia as a Target Pain Indication." Annual Meeting of the Facial Pain Research Foundation, Gainesville, FL, March 2019.

Invited Speaker: "Transcriptomics of pain inform translational analgesic clinical trials of a potent TRPV1 agonist" School of Behavioral and Brain Sciences, University of Texas, Dallas, TX May 2019.

Invited Participant: Workshop: The Human DRG, TG and Spinal Cord Consortium: A translational bridge for pain and migraine therapeutic discovery, University of Texas, Dallas, TX, August 2019.

Invited Speaker: "Genetic Mutations and Copy Number Variants Related to Pain Insensitivity," Division of Pre-Clinical Innovation, NCATS, NIH, December 2019.

Invited Speaker: "New Non-Opioid interventional treatment for pain," Meeting of the NIH Behavioral and Social Sciences Research Coordinating Committee, NIH Bethesda MD, February 2020.

Workshop Participant: Measurement of Pain: Behavioral, Social and Biological Factors. Office of Behavioral and Social Sciences Research, NIH Bethesda MD, February 2020

Invited speaker: Virtual Symposium, American Society of Anesthesiologists, 2020

Invited speaker: "Targeted Toxins: Capsaicin and Resiniferatoxin," 2021 NC Veterinary Pain Virtual Short Course, April 2021

Invited Speaker: "The Critical Cells for Pain and Pain Control," "Pain Research Center Collaborative Project Presentations, NIH Bethesda MD, March 2022.

Invited Speaker: "Nociceptome Analysis Using In Situ Hybridization," Visualization of Diverse RNA Biomarkers to Advance Spatial Biology," RNA Scope Symposium, NIH Bethesda MD, May 2022.

Invited Speaker: "Runx1 transcription factor mutations and human nociception," Translational and Functional Genomics Branch, NHGRI, NIH Bethesda MD, May 2022

Invited Speaker: "Molecular circuitry and chemoablative pain control," Pittsburgh Center for Pain Research, University of Pittsburgh, Pittsburgh, PA, October 2022.

Invited Speaker: "Advantages of Direct-in-Human Basic Research for Analgesic Drug Development," First Annual Translational Research Conference, San Diego, CA, February 2023.

Invited Speaker: "Translational and clinical studies of a non-opioid analgesic," Science Policy Branch, Office of Science Policy and Communication, National Institute on Drug Abuse, April 2023.

Invited Speaker: "Opioid and non-opioid therapeutics – implications for pain relief and substance use," "Resiniferatoxin as a non-opioid therapy for chronic pain" UF CARE Annual Symposium. Center for Addiction Research & Education University of Florida, Gainesville FL April 2023.

Invited Speaker: "Adenosine A3 receptors in neural components of the nociceptive circuit." ReJoin Consortium, Online presentation. October 2023.

Invited Speaker: "Identification of a new genetic mechanism of pain insensitivity." NIH Pain Consortium Quarterly Meeting, NIH, March 2024.

Invited Speaker: "Peripheral mechanisms for pain control," US-Taiwan Bilateral Symposium on Brain Research, NIH, April 2024

Invited Speaker: "Intraarticular resiniferatoxin to treat osteoarthritic pain," ReJoin Consortium Omics Subgroup, Online presentation. September 2024.

Invited Speaker: "Xenium spatial transcriptomics in human spinal cord reveals high expression of the neuropeptide cocaine and amphetamine regulated transcript (CART) in large "Waldeyer" marginal zone spinothalamic projection neurons," Pain Research Center, NCCIH, NIH. December 2024.

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