

WAKE FOREST SCHOOL OF MEDICINE

Curriculum Vitae

August 15, 2022



NAME:

Edgar Alfonso Romero Sandoval, MD, PhD.

ADDRESS:

BUSINESS:

Department of Anesthesiology
Pain Mechanisms Laboratory
Wake Forest School of Medicine
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Winston-Salem, North Carolina 27157-1009
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EDUCATION:

Nov 12, 1999

M.D. Bachelor of Medicine and Surgery, Faculty of Medicine. University of San Carlos of Guatemala. University Center of Occident (Universidad de San Carlos de Guatemala, Centro Universitario de Occidente)

2002

Exam of research competence (12 credits): Study of analgesic effects of Nitric Oxide donors NSAIDs. Department of Physiology, Faculty of Medicine, University of Alcalá, Madrid, Spain
Tutor: Dr. Juan Fernando Herrero González
Grade: First Class (A or 10 points)

Jul 25, 2003

Ph.D. University of Alcalá. University of Alcalá. Alcalá de Henares, Madrid, Spain. (Summa Cum Laude)
Doctoral Thesis: Nitroparacetamol and Retinoic Acid Effects on spinal processing of nociceptive information
Tutor: Dr. Juan Fernando Herrero González

POSTDOCTORAL TRAINING:

Oct 2003-Oct 2006

Research Associate – Postdoctoral
Pain Mechanisms Laboratories
Department of Anesthesiology
Wake Forest University School of Medicine
Winston Salem, North Carolina, USA
Mentor: Dr. James C. Eisenach, FM James, III Professor of Anesthesiology, Vice Chair for Research, Director of Center for the Study of Pharmacologic Plasticity in the Presence of Pain. Wake Forest University Health Sciences

Oct 2006-Apr 2007

Research Associate - Postdoctoral.
Department of Anesthesiology, Dartmouth Medical School, Lebanon, New Hampshire, USA
Mentor: Dr. Joyce A. DeLeo
Professor of Anesthesiology and Pharmacology,
Dartmouth College - Dartmouth Hitchcock Medical Center,
Director of the Neuroscience Center at Dartmouth

- April 13-14, 2015
Connecting the Dots: Effectively Communicating Science to Non-Scientists.
Research!America and School of Media & Public Affairs
The George Washington University
Washington D.C., USA.
- March 2021-July 2021
2021 Translational Science Leadership Academy.
CTSI – Clinical and Translational Science Institute, Team Science Program
Wake Forest School of Medicine, Winston Salem, NC, USA
Associate Program Leader: Holly Brower
Professor of Business, Wake Forest University.

EMPLOYMENT:

ACADEMIC APPOINTMENTS

- Apr 2007 to Jun 2009
Faculty-Instructor
Department of Anesthesiology, Dartmouth Medical School,
Lebanon, New Hampshire
- Jul 2009 to Dec 2012
Assistant Professor (tenure-track)
Department of Anesthesiology and Pharmacology &
Toxicology
- 2011-2012
Ph.D. Program in Experimental Molecular Medicine
Dartmouth Medical School (Geisel School of Medicine)
Lebanon, New Hampshire
- Jan 2013 to Jun 2014
Assistant Director of Research
Office of Research
Presbyterian College School of Pharmacy
Clinton, SC
- Jan 2013 to June 2016
Associate Professor (tenure-track)
Department of Pharmaceutical and Administrative
Sciences
Presbyterian College School of Pharmacy
Clinton, SC
- Jul 2014 to June 2016
Director of Research
Office of Research
Presbyterian College School of Pharmacy
Clinton, SC
- June 2017 to July 2017
Promoted to Professor with tenure (effective July 2017)
Department of Pharmaceutical and Administrative
Sciences
Presbyterian College School of Pharmacy
Clinton, SC
- April 2017 to date
Associate Professor (tenure-track)
Department of Anesthesiology
Wake Forest University School of Medicine
Winston Salem, NC

ADMINISTRATIVE SERVICE:

SCHOOL OF MEDICINE:

2007 and 2008	Organizer of Neuroscience and Clinical Pain Correlation Journal Club. Neuroscience Center at Dartmouth (for Faculties, Graduate Students and Postdoctoral Fellows), Pain Clinic / Department of Anesthesiology (for Pain Clinic Residents), Program in Experimental and Molecular Medicine (for Ph.D. students). Geisel School of Medicine at Dartmouth.
2010 and 2011	Organizer of Clinical Pain Correlation Journal Club Pain Clinic / Department of Anesthesiology (for Pain Clinic Residents, Faculties, Graduate Students and Postdoctoral Fellows). Geisel School of Medicine at Dartmouth
2011 and 2012	Co-Organizer (with Dr. Joe Cravero) of Anesthesia Research Discussion Group. Pain Clinic / Department of Anesthesiology (for Pain Clinic Residents, Anesthesiology Residents, Faculties, Graduate Students and Postdoctoral Fellows). Geisel School of Medicine at Dartmouth
2011-2012	Member of the Neuroscience Center at Dartmouth Events Committee. Geisel School of Medicine at Dartmouth.
2011-2012	Member of the Anesthesiology Research Committee Geisel School of Medicine at Dartmouth.
2011-2012	Adjunct Member of the MD-PhD Admissions and Advisory Committee at Geisel School of Medicine at Dartmouth.
2012-2013	Member Faculty Development Committee, Presbyterian College School of Pharmacy
2013-2014	Chair of the Faculty Development Committee, Presbyterian College School of Pharmacy. 2013-2014.
2013-2017	Member of Honor Council, Presbyterian College School of Pharmacy.
2013-2017	Member of the IRB Committee, Presbyterian College School of Pharmacy.
2013-2015	Member of the IACUC committee, Presbyterian College School of Pharmacy.
2013-2015	Chair of the IACUC committee, Presbyterian College School of Pharmacy
2013-2017	Member of the Assessment Committee, Presbyterian College School of Pharmacy.

2015-2017	Member of the Academic Standards Committee, Presbyterian College School of Pharmacy
2017-	Member of the CIPN Working Group, Wake Forest University School of Medicine
2021-	Member of the Undergraduate Medical Education Curriculum Committee (UMECC), Wake Forest School of Medicine
2021-	Member of the Focus Area Leaders for the Neurosciences Research Building, Wake Forest School of Medicine
2021-	Faculty Interviewer for Director-level positions for the Offices of Sponsored Programs and Clinical Research, Wake Forest School of Medicine
2022-	Department of Anesthesiology's Justice, Diversity, Equity, Inclusion (JEDI) Committee
2022-	Director of the Neuroscience Research Center Search Committee, Wake Forest University School of Medicine

INSTITUTIONAL SERVICE:

July 2005	<p><u>Participation as Member of Evaluation Committees:</u> Member of the evaluation committee of the doctoral thesis: Efectos supraespinales de la N-ciclopentil adenosina (CPA) en ratas adultas con inflamación de tejidos blandos. Interacción con sistemas opioides (Supraspinal effects of N-cyclopentyl adenosine in soft tissue inflamed rats. Interaction with opioid systems). Student: Dr. Guillermo Antonio Ramos Zepeda Thesis adviser: Dr. Juan F. Herrero González. Department of Physiology, University of Alcalá, Madrid, Spain</p>
February 2007	<p>Member of the evaluation committee of the doctoral thesis: Implicación de la medetomidina y del ácido retinóico en la sensibilización nociceptiva. Interacción con anti-inflamatorios no esteroideos (Implication of medetomidine and retinoic acid in the nociceptive sensitization. Interaction with non-steroidal anti-inflammatory drugs). Student: Carlos Molina Camacho Thesis adviser: Dr. Juan F. Herrero González. Department of Physiology, University of Alcalá, Madrid, Spain</p>
June 2007	<p>Substitute Member of the evaluation committee of the doctoral thesis: Estudio de los efectos antinociceptivos de fármacos analgésicos en el dolor neuropático (Study of the antinociceptive effects of analgesic drugs in neuropathic pain). Student: Maria del Mar Curros Criado. Thesis adviser: Dr. Juan F. Herrero González. Department of Physiology, University of Alcalá, Madrid, Spain</p>

- November 2018 Member of the evaluation committee of the doctoral thesis:
La quinasa activada por AMP (AMPK) como diana terapéutica en carcinoma. Papel de la capsaicina. AMP activated kinase (AMPK) as therapeutic target for cancer. Role of capsaicin.
Student: Alicia Bort Bueno
Thesis adviser: Dr. Ines Diaz-Laviada Marturet.
Department of Systems Biology, University of Alcala, Madrid, Spain
- December 2020 Member of the evaluation committee of the doctoral thesis:
Characterization of Peripheral Nociceptors During Chronic Secondary Pain: Experimental Studies In Mice.
Student: Laura Bernal-Sanchez
Thesis adviser: Dr. Carolina L. Roza Fernandez de Caleyá
Department of Systems Biology, University of Alcala, Madrid, Spain
- April 2021 Member of the evaluation committee of the doctoral thesis:
Efectos Inmunomoduladores Y Potencial Terapéutico Del IMT504 En Ratas Con Dolor Inflamatorio Persistente - Análisis Celular, Conductual Y Farmacológico En Roedores. Immunomodulatory effects and therapeutic potential of IMT504 in rats with persistent inflammatory pain – Cellular, behavioral, and pharmacological analysis in rodents.
Student: Candelaria Leiguarda
Thesis adviser: Dr. Pablo Brumovsky
Faculty and Graduate School of Biomedical Sciences, Austral University, Buenos Aires, Argentina.
- 2014-2016 Leadership – Program Development and Administration, Office of Research, PCSP (See Leadership Program Development details, Mentoring Relationships-Research)
Funded by: National Institutes of Health (NICHD) G11 (BRAD) Grant entitled, “Developing an Office of Sponsored Projects at Presbyterian College” funded for 5 years (\$440,000)

EXTRAMURAL APPOINTMENTS AND ACTIVITIES:

- 2013 - 2015 Member, American Pain Society Web Content Work Group
- 2015 - 2019 Member of the American Pain Society Website Committee
- 2015 - 2019 Member, American Pain Society Membership Committee
- July 2017 - 2019 Co-Chair of the American Pain Society, Basic Science Special Interest Group. Elected by SIG members (5 candidate nominees)

January 2019 - July 2019	Nominating Committee – Member-at-Large, American Pain Society (<u>Elected by APS members</u>); APS dissolved July 2019
2021 – present	Member, Committee of Committees, US Association for the Study of Pain.
2021 – present	Member, Nominations Committee, US Association for the Study of Pain.
2021 – present	Co-Chair , Inclusion, Diversity, Equality & Access (IDEA) Committee, US Association for the Study of Pain.
July 2022 – present	Active Member of the Association of University Anesthesiologists (AUA). Nominated by Dr. James Eisenach and elected by Active Membership of the AUA.

CONSULTANT APPOINTMENTS:

11/2014	Otsuka – Sativex Oncology Pain Advisory Board Meeting
4/2015 - 6/2015	Valley Agriceuticals

Editorial:

Dec 2016 to Feb 2021	Associate Editor-in-Chief of the Journal of Pain Research (DovePress)
March 2021 - present	Deputy Editor-in-Chief of the Journal of Pain Research (DovePress)
January 2020 to October 2021	Topic Editor, Verification of Animal Pain Models by Reverse Translation, Frontiers in Pharmacology (Leader Topic Editor: Robert M. Caudle, Co-Topic Editor: Maree Therese Smith)

Ad Hoc Journal Reviewer:

Reviewer of Annals of Internal Medicine, Anesthesiology, Arthritis & Rheumatism, Behavioural Pharmacology, BMJ Open, BMC Anesthesiology, Brain Research, Brain Behavior and Immunity, British Journal of Anaesthesia, Canadian Journal of Anesthesia, Canadian Journal of Pain, Cannabis and Cannabinoid Research, Clinical and Experimental Pharmacology, Current Opinion in Pharmacology, European Journal of Neuroscience, European Journal of Pain, European Journal of Pharmacology, Frontiers in Pharmacology, Frontiers in Psychiatry, Glia, Int J of Drug Policy, J of Neuroimmune Pharmacology, Immunological Investigations and Physiological Genomic, International Immunopharmacology, International Journal of Drug Policy, International J of Molecular Sciences, J of Clinical Rheumatology, Journal of Neurochemistry, Journal of Neuroscience, Journal of Neuroscience Methods, Journal of Pain, Journal of Pharmacology and Experimental Therapeutics, Life Science, Molecular Pain, NeuroReport, Neuroscience, Neuroscience Letters, Neuroscience Research, Oncotarget, Pain, Pain Medicine, Pain Research and Treatment, Pain Reports, Pharmacological Research, Pharmacology, Pharmacology Biochemistry and Behavior, Pharmacological Research,

Pharmacological Reviews, Physiology, PLoS One, Scientific Reports, Tissue Engineering and Regenerative Medicine.

Science Communication Activities:

- *Civic Science Fellows Program – Rita Allen Foundation February 2020 – June 2021*
Civic Science Pain Fellow: Gregory Carbonetti.
Role: Resource Partner: Civic Science Fellows resource partners are multidisciplinary experts who serve as advisors to the Civic Science Fellows, contribute knowledge to the learning community, and help to expand participants' networks
- *Civic Science Learning Lab – May 5, 2020*
Title: Pain: Communicating the science without increasing the hurt.
Moderators: Laura Lindenfeld Sher and Gregory Carbonetti
Role: Speaker/Panelist (Other speakers/panelists: Elizabeth Christopherson, Alan Alda, Ted Price).
- *The Pain Beat podcast (Episode 6) – November 2020*
Title: Communicating Science in an empathic and inclusive way: Why and how should pain researchers do it?
Creator: Rebecca Seals
Role: Moderator (speakers/panelists: Gregory Carbonetti, Elizabeth Christopherson, Juan Miguel Jimenez, Laura Lindenfeld, Carolina Roza).
- *Pain Research Forum online seminar series. November 16, 2020.*
Speaker, Geoffroy Laumet. Title: Neuro-immune crosstalk contributes to remission from neuropathic pain.
Role: Moderator
- *Civic Science Fellows Plenary Session – Oct 26, 2021*
Moderators: Elizabeth Christopherson
Role: Panelist (Other panelists: Kirsten Ellenbogen, Stephanie Nguyen, Frances Colon).

FUNDING AGENCY REVIEWER:

International:

- Diabetes UK Foundation, UK. Grant reviewer. 04/13/2010 (1 application).
- Health Research Board (HRB), agency in Ireland that supports health research. Grant reviewer. 27/02/2009 (1 application).
- Biotechnology and Biological Sciences Research Council (BBSRC), United Kingdom. 1/9/2016. (1 application).
- Ministry of Economy and Competitiveness, National Agency of Evaluation and Forward Planning (Agencia Nacional de Evaluación y Prospectiva - ANEP). 10/18/2015. (1 application).
- Ministry of Economy and Competitiveness, National Agency of Evaluation and Forward Planning (Agencia Nacional de Evaluación y Prospectiva - ANEP). 08/05/2017. (1 application).
- The Swiss National Science Foundation (SNFS) – 2/11/2018. (1 application).
- Consortium Québécois sur la Découverte du Médicament (CQDM), SynergiQc Program – 2/20/2018. (1 application).
- Ministry of Economy and Competitiveness, National Agency of Evaluation and Forward Planning (Agencia Nacional de Evaluación y Prospectiva - ANEP). 01/30/2019. (1 application).

- The Swiss National Science Foundation (SNFS) – 2/11/2020. (1 application).
- ZonMw- The Netherlands Organization for Health Research and Development – Rational Pharmacology Program (1 application). March 2020.

National:

- Integrative, Functional, and Cognitive Neuroscience (NIH; ZRG1 IFCN-E (02) M), Special Emphasis Panel (SEP), Drug Discovery for the Nervous System. 5/4/2010 - 5/5/2010 (1 R01 application).
- Molecular, Cellular, and Developmental Neuroscience Study Section (NIH; ZRG1 MDCN-B 91 S), Special Emphasis Panel (SEP), Drug discovery for the Nervous System. 2/25/2011 (1 R01 and 1 R21 applications).
- The Johns Hopkins Brain Science Institute (BSi). Grant reviewer. 08/15/2011 (1 application)
- Molecular, Cellular, and Developmental Neuroscience Study Section (NIH; ZRG1 MDCN-B 91 S), Special Emphasis Panel (SEP), Drug Discovery for the Nervous System II. 11/02/2011 (2 R01 applications).
- Molecular, Cellular, and Developmental Neuroscience Study Section (NIH; ZRG1 MDCN-B 40 P), Special Emphasis Panel (SEP). 11/07/2012-11/08/2012 (1 P01 application, 1 project assigned).
- Molecular, Cellular, and Developmental Neuroscience Study Section (NIH; ZRG1 MDCN-B (04) S), Special Emphasis Panel (SEP), Drugs and Channels. 3/11/2013 (1 R01 and 1 R21 applications).
- National Institute on Drug Abuse Special Emphasis Panel, (NIH; ZDA1 SXC-E (13) 1), Cutting Edge Basic Research Awards (CEBRA). 3/28/2013 (1 R21 application).
- National Institute on Drug Abuse Special Emphasis Panel, (NIH; ZRG1 MDCN-T (06)), Molecular Neuropharmacology. 3/11/2014 (1 R21 application).
- Rita Allen Foundation and American Pain Society. 3/17/2014 (2 applications)
- National Institute of Health, ETTN IRG, Division of Neuroscience, Development and Aging, (NIH; 2014/10 ZRG1 ETTN-M (11) B), Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders Small Business SEP. 6/23/2014-6/24/2014 (9 R41/43/44 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review Group 2015/01 ZRG1 ETTN-M (11) - Small Business: Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 10/27/2014-10/28/2014 (8 R41/43/44 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review Group 2015/01 ZRG1 ETTN-M (11) - Small Business: Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 2/26/2015-2/27/2015 (9 R41/43/44 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review Group 2016/01 ZRG1 MDCN-B (40) P. New Modalities for the Treatment of Pain and Drug Abuse. 11/17/2015-11/17/2015 (1 project and 1 core applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review Group 2016/05 ZRG1 ETTN-M (11) B - Small Business: Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 3/14/2016-3/15/2016 (8 R41/43/44 applications).
- Rita Allen Foundation and American Pain Society. 3/17/2016 (3 applications)
- National Institute of Health, Special Emphasis Panel/Scientific Review Group 2016/05 ZRG1 ETTN-M (11) B - Small Business: Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 11/3/2016-11/4/2016 (7 R41/43 applications).
- Rita Allen Foundation and American Pain Society. 3/16/2017 (3 applications)
- National Institute of Health, Special Emphasis Panel/Scientific Review 2017/05 ZRG1 ETTN-M (11) B - Small Business: Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 3/26/2017-3/27/2017 (7 R41/43/44 applications)
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-A (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorder. 6/29/2017-6/30/2017 (8 R41/43/44 applications).

- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-A (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorder. 11/16/2017-11/17/2017 (6 R41/43 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-A (50) - Small Business panel on Development of Appropriate Pediatric Formulations and Pediatric Drug Delivery Systems. 11/16/2017-11/17/2017 (No assignments).
- Rita Allen Foundation and American Pain Society. 1/25/2018 (2 applications)
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-A (50) - Small Business panel on Development of Appropriate Pediatric Formulations and Pediatric Drug Delivery Systems. 3/15/2018-3/16/2018 (7 R41/43, 2 R44 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-H (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 11/08/2018-11/09/2018 (6 R43, 2 R44 applications).
- Rita Allen Foundation and American Pain Society. 2/14/2019 (2 applications)
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-A (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 03/21/2019-03/22/2019 (4 R41/43, 3 R44 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-C (50) – HEAL Pain Biomarker. Discovery of Biomarkers, Biomarker Signatures, and Endpoints for Pain. 06/14/2019 (5 R61 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 IFCN-B (07), ZRG1 IFCN-N (55) – HEAL Pain Target. Discovery & Validation of Novel Safe and Effective Pain Treatments 07/16/2019 (3 R01, 3 R21 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-H (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 11/14/2019-11/15/2019 (4 R41, 3 R43, 2 R44 applications).
- Rita Allen Foundation and American Pain Society. 5/28/2020 (3 applications)
- National Institute of Health, Special Emphasis Panel/Scientific Review ZDA1 TXT-V (05) – SEP II: Step Up for Substance Use Disorders (SUD): A drug target initiative for scientists engaged in fundamental research. 06/23/2020 (4 U18 applications).
- National Institute of Health, Somatosensory and Pain Systems Study Section. 06/17/2020 – 06/18/2020 (3 R01, 4 R21 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-H (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 11/19/2020-11/20/2020 (3 R41, 5 R43, 1 R44 applications).
- Department of Defense, Congressionally Directed Medical Research Programs. Breast Cancer Research Program CET-9. 12/01/2021 (1 Breakthrough application).
- National Institute of Health, NST-2 Subcommittee, Neurological Sciences Training Initial Review Group, NINDS. 02/17/2021-02/19/2021 (2 K99, 2 F32 applications).
- National Institute of Health, Special Emphasis Panel/Scientific Review ZRG1 ETTN-H (11) - Small Business panel on Drug Discovery for Aging, Neuropsychiatric and Neurologic Disorders. 03/09/2021-03/10/2021 (3 R41, 1 R43, 3 R44 applications).
- Rita Allen Foundation and American Pain Society. 10/19/2021 (3 applications)
- **Neurobiology of Pain and Itch** Study Section, National Institute of Health, 06/2020 – 06/2025

Regional:

- Synapse meeting (Asheville NC, March 28, 2015). 3/3/2015. (22 abstracts).
- APS Basic Science and Clinical Data Blitz (Anaheim CA, March 4-6, 2018). 01/24/2018 (23 abstracts)
- APS Basic Science and Clinical Data Blitz (Milwaukee, WI, April 2-3, 2019). 01/17/2019 (19 abstracts)

Local:

- Small Pharmacy Awards for Research and Collaboration (SPARC). 9/12/2013 (3 applications).
- Small Pharmacy Awards for Research and Collaboration (SPARC). 2/2/2014 (3 applications).
- Small Pharmacy Awards for Research and Collaboration (SPARC). 6/1/2015 (3 applications).
- WFU Pilot Research Grant, Center for Research on Substance Use and Addiction (CRSUA). 01/01/2020 (1 application).
- WFU CTSI KL2 Mentored Career Development Award. 01/15/2021 (1 application)
- UNC CTSI KL2 Mentored Career Development Award. 01/07/2021 (1 application)

PROFESSIONAL MEMBERSHIPS:

2003-present	Member of the Society for Neuroscience
2008-2019	Member of the American Pain Society (APS dissolved July 2019)
2009-present	Member of the International Association for the Study of Pain
2009-2012	Member of The American Association for the Advancement of Science
2011-2012	Member of the New Hampshire chapter of the Society for Neuroscience
2020-present	US Association for the Study of Pain

HONORS AND AWARDS:

1994-1996	Scholarship/loan by Universidad of San Carlos de Guatemala. Endowment: 1994: \$600.00, 1995: \$600.00 and 1996: \$675.00
2000-2003	“Beca Mutis” (Mutis Scholarship) by Spanish Association of International Cooperation, Government of Spain (Asociacion Española de Cooperacion Internacional, AECl). Endowment: 2000/2001: 9,000 Euros, 2001/2002: 9,000 Euros and 2002/2003: 10,800 Euros
Sept 22-26, 2001	3 rd prize “Best Poster competition” 5 th World Congress on Inflammation; Edinburgh, Scotland
Jan 1 2009-May 31, 2011	American Pain Society Future Leaders in Pain Small Research Grants - Cannabinoids and Neuroimmune Interactions in Acute and Chronic Pain. \$20,000 – Role: PI.
Aug 2-7 2009	Carl Storm Underrepresented Minority Fellowship - 2009 Cannabinoid Function in the CNS Gordon Research Conference. University of New England, Biddeford, ME; \$600.00
Nov 1-3 2013	Best Oral presentation. The Pain Society of the Carolinas, Annual meeting, Ashville, NC; Title: Implication of the phosphatase MKP-3 in the transition from acute to chronic postoperative pain.
2014-2015	Faculty Scholarship Award, Presbyterian College (distinguished

work in research and scholarship).

2020-2021

Research Excellence Award, Wake Forest School of Medicine

GRANT FUNDING:

CURRENTLY ACTIVE GRANTS:

- **R01 NS114653 - NINDS (Romero-Sandoval, 3 calendar)** 02/15/20 - 02/14/25
Endoplasmic Reticulum Stress Responses in Pain \$2,002,006 (D&I Costs)
The major goal of this project is to elucidate the molecular, physiological, and cellular mechanisms that drive IRE1-XBP1-dependent neuroimmune modulation that results in a delayed recovery of chronic neuropathic pain.
Collaborators: Cubillos-Ruiz, Boada, MPIs.
- **Pilot Funding Award WFU-CRSUA (Romero-Sandoval, PI, 0.1 calendar)** 02/01/21 – 01/31-23
Cannabis marketing strategies and patient preferences and attitudes towards cannabis products. \$37,000 DC
The objective of this project is to evaluate how dispensary practices (medical and recreational) affects chronic pain patients' attitudes and perceptions on smoked cannabis products.
Collaborators: Reboussin, Wagoner, Co-Is.
- **WFB Comprehensive Cancer Center Development Award to Promote Diversity (Romero-Sandoval, PI, 0.1 calendar)** 03/01/21 – 02/28/23
ER stress status as biomarker for CIPN. \$100,000 DC
The objective of this project is to obtain preliminary data to support a larger grant application that will investigate the potential of ER stress markers as predictors of CIPN disease progression.
Role: PI
- **R01 DA051542 (Romero-Sandoval, Co-I, 1.2 calendar)** 07/15/21 – 05/31/26
The Impact of Cannabidiol (CBD) Health Claims at Point-of-Sale on Consumer Perceptions and Behavior \$2,757,764 (D&I Costs)
This project aims to document the types of health claims being made by CBD retailers, evaluate how consumers perceive them, and evaluate their impact on consumer purchase of CBD products to inform the development of interventions that ensure consumers are not misled about CBD.
Collaborators: Wagoner (PI)
- **R01 NS122153 (Romero-Sandoval, PD/PI, 4.2 calendar)** 01/15/22 - 12/31/26
Targeting macrophage ED2/CD163 for pain management \$2,260,911 (D&I Costs)
The objective of this project is to validate a cell-directed gene therapy using nanotechnology to treat pain and reduce opioid requirements. Specifically, it will validate the induction of ED2/CD163 overexpression exclusively in infiltrating macrophages to promote the resolution of inflammation and pain following major surgeries and arthritis.
Collaborators: Martin, MPI
- **R01 DA053209 (Romero-Sandoval, Co-I, 1.2 calendar)** 04/15/22 – 02/28/27
The Impact of Product Packaging on Appeal, Knowledge and Harm Perceptions of Cannabis Edibles \$2,889,461 (D&I Costs)
Edible cannabis products pose unique public health challenges. Edibles packaged as appealing food products are perceived to be less harmful than smoking cannabis, despite the greater danger of over-intoxication. Because their psychoactive effects are delayed, adults consume more than the recommended serving. This project will address gaps in our understanding of how to effectively

communicate knowledge and potential harms of edibles to inform state regulatory decision-making for edible product packaging and warnings.

Collaborator: Reboussin (PI)

- **P01NS119159 (Co-I, MPI: Martin, Eisenach, 0.6 calendar) 4/15/22 - 3/31/27**
Oxytocin: a pain disease-modifying agent in the nervous system after injury \$9,989,990 (D&I)
The goals of this P01 are, first, the extrapolation of the pharmacokinetics of oxytocin across species, to interpret physiological or behavioral effects between rats and humans; second, the study of primary sensory afferent physiology across species that determines how oxytocin alters their electrical properties related to pain transmission; and third, the study of pain behaviors beyond reflexive responses or verbal report in animals and humans, respectively, which may offer greater translational value.
Co-Investigator in the Animal Core (7419), Peters, C (PI)

PENDING GRANTS: None

PAST GRANT HISTORY:

- NIDA R01 DA025987-01, Microglial Regulation in Opioid Tolerance, Hyperalgesia and Addiction (Romero-Sandoval, Co-I; DeLeo, PI) 9/30/08 - 08/31/10 (\$250,000/y DC).
- American Pain Society Future Leaders in Pain Research Award, Cannabinoids and Glial Interactions in Acute and Chronic Pain (Romero-Sandoval, PI) 11/01/08 - 04/30/10 (\$20,000 DC)
- NIDA R01 DA025211, Cannabinoids and Neuroimmune Interactions (Romero-Sandoval, PI) 06/01/2009 – 05/31/2012 (\$450,000 DC)
- Hitchcock Foundation, Role of phosphatases in spinal cord neuronal sensitization (Romero-Sandoval, PI) 07/01/2011 – 03/31/2013 (\$30,000 DC)
- Rita Allen Foundation & American Pain Society, Spinal Cord Mechanisms in the Resolution of Postoperative Pain (Romero-Sandoval, PI) 07/01/2011 – 31/3/2016 (\$150,000 DC)
- PC School of Pharmacy, Construction of a zebrafish facility (Romero-Sandoval, PI) 04/01/2013 – 06/31/2014 (\$3000)
- G11 G11HD076487, Developing an Office of Sponsored Projects for Presbyterian College (Fuhrman, Kelly, and Romero-Sandoval, MPI) 05/15/2013 – 04/30/2018 (\$ 407,492 DC).
- NIGMS R15GM109333-01, Cell-directed therapy using nanotechnology for the prevention of chronic postoperative pain (Romero-Sandoval, PI) 9/01/14 - 08/31/17 (\$231,000 DC)
- NIGMS P20GM103499, South Carolina IDeA Network of Biomedical Research Excellence (sub-award 22050-Z204, Asbill, Wetzel, Romero-Sandoval, MPI) 07/10/15 - 04/01/17 (\$437,598 DC)
- PC School of Pharmacy, Specific cell targets to prevent the progression of foot ulcers in diabetic neuropathy (Romero-Sandoval, PI) 09/01/2015 – 06/31/2016 (\$2200)
- NIGMS P20GM103499, Finding CD136 dependent pathways in diabetic macrophages using bioinformatics (sub-award 16-3024 Romero-Sandoval, PI) 01/01/16 - 06/30/16 (\$10,000 DC)

- NIGMS 5P01GM113852, Recovery from pain and disability after surgery, Sub-Projects 8218 and 8216 (Romero-Sandoval, Co-I; Eisenach, PI; Peters, PI of 8218; Martin PI of 8216) 01/04/16 - 03/31/22 (\$1,119,533 year DC)
- PC School of Pharmacy, The potential role of TWEAK in CD163's effects (Romero-Sandoval, PI) 07/01/2016 – 06/31/2017 (\$3000 DC)
- NIGMS R37GM048085-26, Receptor Selective Spinal Analgesia (Romero-Sandoval, Co-I; Jim Eisenach PI) 01/03/18 - 02/28/21 (\$247,138 DC).
- WFU Comprehensive Cancer Center Pilot Grant, Monocyte/macrophage phenotype as a novel marker of peripheral nerve injury in CIPN (Romero-Sandoval, PI) 04/22/18- 4/21/20 (\$7,000 DC)
- ACTION, Assessment of inter-lab reliability in pre-clinical chronic pain treatment studies (Romero-Sandoval, PI) 01/01/20 - 12/31/21 (\$30,000 DC)
- NCI R21CA248106, IRE1a-XBP1 signaling as a driver of chemotherapy-induced peripheral neuropathy (MPI: Romero-Sandoval, Strowd, Cubillos-Ruiz) 04/01/20 - 03/31/22 (\$275,000 DC)

OTHER PROJECTS (Trainee)

- Spinal α_2 -Adrenergic Analgesia. Project Number: R01 GM35523. NIH/NIGM, July 1987-March 2007. Period of participation: Oct 2003 – Oct 2006.
Role: Research Fellow (Postdoctoral trainee)
PI: Dr. James C. Eisenach
- Effects of in vivo treatment in of all-trans retinoic acid in inflammation-induced hyperalgesia. E015/2001. 3,545.97 Euros. Vicerrectorado de Investigación, University of Alcalá. 30/01/2001-31/12/2001.
Role: Ph.D. student. PI: Dr. Juan F. Herrero
- Comparison of the analgesic activity of tramadol, NO-tramadol, paracetamol and NO-paracetamol in rat single motor units (SMU). 30,000.00 Euros. Nicox. 2001.
Role: Ph.D. student. PI: Dr. Juan F. Herrero
- Antinociceptive activity and mechanisms of action of Nitro-derivatives in normal animals and in animals with hyperalgesia. 60,000.00 Euros. NicOx S.A. 2002-2003.
Role: Ph.D. student. PI: Dr. Juan F. Herrero
- Last generation NSAIDs: Mechanism of action and enhancement of opioid analgesia. 08.5/0068./2000 1. Dirección General de Investigación de la Comunidad de Madrid. 01/012001 – 12/30/2002.
Role: Ph.D. student. PI: Dr. Juan F. Herrero
- Descending modular systems, implication and new therapeutic strategies in pathologic pain. SAF2001-1048-C03-03. Ministerio de Ciencia y Tecnología. 01/01/2002 – 12/30/2004.
Role: Ph.D. student. PI: Dr. Juan F. Herrero
- Study of the antinociceptive activity of two to four different compounds in single motor unit recordings. 5,003.00 Euros. Grünenthal GmbH. 2002-2003.
Role: Ph.D. student. PI: Dr. Juan F. Herrero

BIBLIOGRAPHY:

Anes – (8/15/22)

PEER-REVIEWED PUBLICATIONS:

1. **Romero-Sandoval EA**, Mazario J, Howat D, Herrero JF. NCX-701 (nitroparacetamol) is an effective antinociceptive agent in rat withdrawal reflexes and wind-up. *Br J Pharmacol*. 2002 Mar;135(6):1556-62. PMID: PMC1573254
2. **Romero-Sandoval EA**, Del Soldato P, Herrero, JF. The effects of sham and full spinalization on the antinociceptive effects of ncx-701 (nitroparacetamol) in monoarthritic rats. *Neuropharmacology*. 2003 37(3):207-214.
3. Herrero JF, **Romero-Sandoval EA**, Gaitan G, Mazario J. Antinociception and the new COX inhibitors: research approaches and clinical perspectives. *CNS Drug Rev*. 2003 Fall;9(3):227-52. Review.
4. **Romero-Sandoval EA**, Alique M, Moreno-Manzano V, Molina C, Lucio FJ, Herrero JF. The oral administration of retinoic acid enhances nociceptive withdrawal reflexes in rats with soft-tissue inflammation. *Inflamm Res*. 2004 Jul;53(7):297-303. Epub 2004 Jun 25.
5. **Romero-Sandoval EA**, McCall C, Eisenach JC. Alpha2-adrenoceptor stimulation transforms immune responses in neuritis and blocks neuritis-induced pain. *J Neurosci*. 2005 Sep 28;25(39):8988-94.
6. **Romero-Sandoval EA**, Eisenach JC. Clonidine reduces hypersensitivity and alters the balance of pro- and anti-inflammatory leukocytes after local injection at the site of inflammatory neuritis. *Brain Behav Immun*. 2007 Jul;21(5):569-80. Epub 2006 Oct 31. PMID: PMC1949871
7. **Romero-Sandoval EA**, Molina C, Alique M, Moreno-Manzano V, Lucio FJ, Herrero JF. Vitamin A active metabolite, all-trans retinoic acid, induces spinal cord sensitization. I. Effects after oral administration. *Br J Pharmacol*. 2006 Sep;149(1):56-64. Epub 2006 Jul 17. PMID: PMC1629405
8. **Romero-Sandoval EA**, Molina C, Herrero JF. Enhancement of the analgesic activity of paracetamol and nitroparacetamol by the oral administration of all-trans retinoic acid. *Neuropharmacology*. 2006 Sep; 51(4):858-65. Epub 2006 Jul 25.
9. **Romero-Sandoval EA**, Eisenach JC. Perineural clonidine reduces mechanical hypersensitivity and cytokine production in established nerve injury. *Anesthesiology*. 2006 Feb;104(2):351-5.
10. **Romero-Sandoval EA**, Curros-Criado MM, Gaitan G, Molina C, Herrero JF. Nitroparacetamol (NCX-701) and pain: first in a series of novel analgesics. *CNS Drug Rev*. 2007 Fall;13(3):279-95. Review.
11. **Romero-Sandoval EA**, Eisenach JC. Spinal cannabinoid receptor type 2 activation reduces hypersensitivity and spinal cord glial activation after paw incision. *Anesthesiology*. 2007 Apr;106(4):787-94.
12. **Romero-Sandoval EA**, Bynum T, Eisenach JC. Analgesia induced by perineural clonidine is enhanced in persistent neuritis. *Neuroreport*. 2007 Jan 8;18(1):67-71.
13. Summer GJ, **Romero-Sandoval EA**, Bogen O, Dina OA, Khasar SG, Levine JD. Proinflammatory cytokines mediating burn-injury pain. *Pain*. 2008 Mar;135(1-2):98-107. Epub 2007 Jun 27.

14. **Romero-Sandoval EA**, Nutile-McMenemy N, DeLeo JA. Spinal microglial and perivascular cell cannabinoid receptor type 2 activation reduces behavioral hypersensitivity without tolerance after peripheral nerve injury. *Anesthesiology*. 2008 Apr;108(4):722-34.
15. **Romero-Sandoval EA**, Chai N, Nutile-McMenemy N, DeLeo JA. A comparison of spinal Iba1 and GFAP expression in rodent models of acute and chronic pain. *Brain Res*. 2008 Jul 11;1219:116-26
16. **Romero-Sandoval EA**, Horvath JA, DeLeo JA. Neuroimmune Interactions and Pain: Focus on Glial-Modulating Targets. *Curr Opin Investig Drugs*. 2008 Jul;9(7):726-34.
17. **Romero-Sandoval EA**, Horvath R, Landry RP, DeLeo JA. Cannabinoid receptor type 2 activation induces a microglial anti-inflammatory phenotype and reduces migration via MKP induction and ERK dephosphorylation. *Mol Pain*. 2009 May 28;5:25.
18. Horvath RA, **Romero-Sandoval EA**, DeLeo JA. Inhibition of microglial P2X4 receptors attenuates morphine tolerance, Iba1, GFAP and mu opioid receptor protein expression while enhancing perivascular microglial ED2. *Pain*. 2010 doi:10.1016/j.pain.2010.02.042.
19. Alkaitis MS, Solorzano C, Landry RP, Piomelli D, DeLeo JA, **Romero-Sandoval EA**. Evidence for a Role of Endocannabinoids, Astrocytes and p38 Phosphorylation in the Resolution of Postoperative Pain. *PLoS One*. 2010 May 28;5(5):e10891
20. Horvath R, Landry RP, **Romero-Sandoval EA** and DeLeo JA. Morphine tolerance attenuates the resolution of postoperative pain and enhances spinal microglial p38 and extracellular receptor kinase phosphorylation. *Neuroscience*. 2010 Aug 25;169(2):843-54
21. Jacobs VL, Landry RP, Liu Y, **Romero-Sandoval EA**, De Leo JA. Propentofylline decreases tumor growth in a rodent model of glioblastoma multiforme by a direct mechanism on microglia. *Neuro Onc*. 2012 Feb;14(2):119-31.
22. Landry RP, Jacobs VL, **Romero-Sandoval EA**, De Leo JA. Propentofylline, a CNS glial modulator does not decrease pain in post-herpetic neuralgia patients: In vitro evidence for differential responses in human and rodent microglia and macrophages. *Experimental Neurology*. 2012 Apr;234(2):340-50
23. Ndong C, Landry, RP, DeLeo JA, **Romero-Sandoval EA**. Mitogen activated protein kinase phosphatase-1 prevents the development of tactile sensitivity in a rodent model of neuropathic pain. *Molecular Pain* 2012, 8:34.
24. Landry RP, Martinez E, DeLeo JA, **Romero-Sandoval EA**. Spinal cannabinoid receptor type 2 agonist reduces mechanical allodynia and induces mitogen-activated protein kinase phosphatases in a rat model of neuropathic pain. *Journal of Pain* 2012 Sep;13(9):836-48.
25. Saha M, Skopelja S, Martinez E, Alvarez DL, Liponis BS, **Romero-Sandoval EA**. Spinal Mitogen-Activated Protein Kinase Phosphatase-3 (MKP-3) is Necessary for the Normal Resolution of Mechanical Allodynia in a Mouse Model of Acute Postoperative Pain. *J Neurosci*. 2013 Oct 23;33(43):17182-7.
26. Ndong C, Landry, RP, Saha M, **Romero-Sandoval EA**. Mitogen-activated protein kinase (MAPK) phosphatase-3 (MKP-3) displays a p-JNK-MAPK substrate preference in astrocytes *in vitro*. *Neurosci. Lett*. 2014 May 23;575C:13-18.
27. Asbill S, Sweitzer SM, Spigener S, **Romero-Sandoval A**. Compounded pain formulations. *Anes* – (8/15/22)

- What is the evidence? *Int J Pharm Compd.* 2014 Jul-Aug;18(4):278-86.
28. Paige C, Hill B, Canterbury J, Sweitzer S, **Romero-Sandoval EA**. Construction of an Affordable and Easy-to-Build Zebrafish Facility. *J Vis Exp.* 2014 J Vis Exp. 2014 Nov 22;(93):e51989. doi: 10.3791/51989.
 29. Heustess A, Spigener S, Sweitzer SM, **Romero-Sandoval A**, Asbill S. Analgesic efficacy and transdermal penetration of topical gabapentin creams: Finding an optimal dose and pre-treatment time. *Int J Pharm Compd.* 2015 Mar-Apr;19(2):167-173.
 30. **Romero-Sandoval EA**, Asbill S, Paige CA, Byrd-Glover K. Peripherally restricted cannabinoids in pain treatment. Review. *Pharmacotherapy.* 2015 Oct;35(10):917-25.\
 31. Savage SR, **Romero-Sandoval A**, Schatman M, Wallace M, Fanciullo G, McCarberg B, Ware M. Cannabis in Pain Treatment: Clinical and Research Considerations. *J Pain.* 2016 Mar 4. pii: S1526-5900(16)00543-5.
 32. Bernal L, Alvarado A, Ferreira D, Paige C, Moron C, Hill B., Caesar M, **Romero-Sandoval EA**. Evaluation of a nanotechnology-based approach to induce gene-expression in human THP-1 macrophages under inflammatory conditions. *Immunobiology.* 2016 Sep 5. pii: S0171-2985(16)30357-6.
 33. Alicia Bort, Perla Abigail Alvarado-Vazquez, Carolina Moracho-Vilrriales, Kristopher G. Virga, Giuseppe Gummina, **E. Alfonso Romero-Sandoval** and Scott Asbill. The effects of JWH015 in cytokine secretion in primary human keratinocytes and fibroblasts and its suitability for topical/transdermal delivery. *Molecular Pain* 2017, vol. 13:1-6
 34. Sladjana Skopelja-Gardner, Madhurima Saha, Perla Abigail Alvarado-Vazquez, Brenna S. Liponis, Elena Martinez, **E. Alfonso Romero-Sandoval**. Mitogen-activated protein kinase phosphatase-3 (MKP-3) in the surgical wound is necessary for the resolution of postoperative pain in mice. *Journal of Pain Research* 28 March 2017:10 1–12.
 35. Jimmy Pruitt III, Carolina Moracho-Vilrriales, Tiffaney Threatt, Sarah Wagner, Jun Wu, **E. Alfonso Romero-Sandoval**. Identification, Prevalence, and Treatment of Painful Diabetic Neuropathy in Patients from a Rural Area in South Carolina. *Journal of Pain Research* 7 April 2017, Volume 2017:10 833-843.
 36. Alvarado-Vazquez PA, Bernal L, Paige CA, Grosick RL, Moracho Vilrriales C, Ferreira DW, Ulecia-Morón C, **Romero-Sandoval EA**. Macrophage-specific nanotechnology-driven CD163 overexpression in human macrophages results in an M2 phenotype under inflammatory conditions. *Immunobiology.* 2017 Aug;222(8-9):900-912.
 37. **Romero-Sandoval EA**, Kolano AL, Alvarado-Vázquez PA. Cannabis and Cannabinoids for Chronic Pain. *Curr Rheumatol Rep.* 2017 Oct 5;19(11):67.
 38. **Romero-Sandoval EA**, Finchan J, Kolano AL, Sharpe B, Alvarado-Vázquez PA. Cannabis for Chronic Pain: Challenges and Considerations. *Pharmacotherapy.* 2018 Jun;38(6):651-662.
 39. Grosick RL, Alvarado-Vázquez PA, Messersmith A, **Romero-Sandoval EA**. High glucose induces a priming effect in macrophages and exacerbates the production of pro-inflammatory cytokines after a challenge. *Journal of Pain Research* 2018 Sep 7;11:1769-1778.
 40. Alvarado-Vázquez, PA; Grosick, R, Moracho-Vilrriales, C; Ward, E; Threatt, T; **Romero-Sandoval, EA**. Cytokine production capabilities of human primary monocyte-

derived macrophages from patients with diabetes mellitus type 2 with and without diabetic peripheral neuropathy. *Journal of Pain Research* 2018 Dec 19;12:69-81.

41. Gutierrez S, Alvarado-Vázquez PA, Eisenach JC, **Romero-Sandoval EA**, Boada MD. Tachykinins modulate nociceptive responsiveness and sensitization: In vivo electrical characterization of primary sensory neurons in tachykinin knockout (Tac1 KO) mice. *Mol Pain*. 2019 Jan-Dec;15:1744806919845750. doi: 10.1177/1744806919845750.
42. Chopra S, Giovanelli P, Alvarado-Vazquez PA, Alonso S, Song M, Sandoval TA, Chae CS, Tan C, Fonseca MM, Gutierrez S, Jimenez L, Subbaramaiah K, Iwawaki T, Kingsley PJ, Marnett LJ, Kossenkov AV, Crespo MS, Dannenberg AJ, Glimcher LH, **Romero-Sandoval EA**, Cubillos-Ruiz JR. IRE1 α -XBP1 signaling in leukocytes controls prostaglandin biosynthesis and pain. *Science*. 2019 Jul 19;365(6450). pii: eaau6499. doi: 10.1126/science.aau6499. *Co-senior corresponding author.
43. David Wilson Ferreira, Cristina Ulecia-Morón, Perla Abigail Alvarado-Vázquez, Katharine Cunnane, Carolina Moracho-Vilriales, Rachel L. Grosick, Thiago Mattar Cunha, **E. Alfonso Romero-Sandoval**. CD163 overexpression using a macrophage-directed gene therapy approach improves wound healing in *ex vivo* and *in vivo* human skin models. *Immunobiology*. 2019 Nov 4:151862.
44. Kim TE, Townsend RK, Branch CL, **Romero-Sandoval EA**, Hsu W. Cannabinoids in the Treatment of Back Pain. *Neurosurgery*. 2020 Feb 25. pii: nyz573.
45. Mary Catherine Cash, Katharine Cunnane, Chuyin Fan, **E. Alfonso Romero-Sandoval**. Mapping cannabis potency in medical and recreational programs in the United States. *PLoS ONE* 2020 Mar 26;15(3):e0230167.
46. Lycan TW, Hsu F, Ahn CS, Thomas A, Walker FO, Sanguenza OP, Shiozawa Y, Park SH, Peters CM, **Romero-Sandoval EA**, Melin SA, Sorscher S, Ansley K, Lesser GJ, Cartwright MS, Strowd RE. Neuromuscular ultrasound for taxane peripheral neuropathy in breast cancer. *Muscle Nerve*. 2020 Feb 12. doi: 10.1002/mus.26833.
47. Pennypacker SD and **Romero-Sandoval EA**. CBD and THC: Do they complement each other like yin and yang? *Pharmacotherapy*. 2020 Nov;40(11):1152-1165.
48. Arora V, Morado-Urbina CE, Gwak YS, Parker RA, Kittel CA, Munoz-Islas E, Miguel Jimenez-Andrade J, **Romero-Sandoval EA**, Eisenach JC, Peters CM. Systemic administration of a β 2-adrenergic receptor agonist reduces mechanical allodynia and suppresses the immune response to surgery in a rat model of persistent post-incisional hypersensitivity. *Mol Pain*. 2021 Jan-Dec; 17:1744806921997206.
49. Park SH, Eber MR, Fonseca MM, Patel CM, Cunnane KA, Ding H, Hsu FC, Peters CM, Ko MC, Strowd RE, Wilson JA, Hsu W, **Romero-Sandoval EA**, Shiozawa Y. Usefulness of the measurement of neurite outgrowth of primary sensory neurons to study cancer-related painful complications. *Biochem Pharmacol*. 2021 Mar 17;188:114520.
50. Uhelski ML, Li Y, Fonseca MM, **Romero-Sandoval EA**, Dougherty PM. Role of innate immunity in chemotherapy-induced peripheral neuropathy. *Neurosci Lett*. 2021 Jun 11;755:135941.
51. Munoz-Islas E, Elizondo-Martinez CE, Gutierrez-Lopez M, Acosta-Gonzalez RI, Zaga-Clavellina V, Helguera-Repetto AC, Ramirez-Rosas MB, **Romero-Sandoval EA**, Jimenez-Andrade JM. Effect of experimental gestational diabetes mellitus on mechanical sensitivity,

capsaicin-induced pain behaviors and skin innervation of male and female mouse offspring. *Journal of Pain Research*, 2021 Jun 2;14:1573-1585.

52. Kimberly G Wagoner, Allison J. Lazard, **E. Alfonso Romero- Sandoval**, Beth A. Reboussin. Health Claims about Cannabidiol (CBD) Products: A Retrospective Analysis of FDA Warning Letters from 2015-2019. *Cannabis and Cannabinoid Research*, 2021 Jun 17. doi: 10.1089/can.2020.0166
53. Mailin Casadei, Esteban Fiore, Julia Rubione, Luciana María Domínguez, María Florencia Coronel, Candelaria Leiguarda, Mariana García, Guillermo Mazzolini, Marcelo Villar, Alejandro Montaner, Luis Constandil, **E. Alfonso Romero Sandoval**, Pablo Brumovsky. IMT504 blocks allodynia in rats with spared nerve injury by promoting the migration of mesenchymal stem cells and by favoring an anti-inflammatory milieu at the injured nerve. *Pain*, 2021 (Pain. 2021 Sep 15. doi: 10.1097/j.pain.0000000000002476).
54. Norikazu Kiguchi, Huiping Ding, Sun H. Park, Kelsey M. Mabry, Shiroh Kishioka, Yusuke Shiozawa, **E. Alfonso Romero-Sandoval**, Christopher M. Peters, Mei-Chuan Ko. Functional roles of neuromedin B and gastrin-releasing peptide in regulating itch and pain in the spinal cord of non-human primates. *Biochemical Pharmacology* 2022 Apr;198:114972.
55. Morgan JW, Pennypacker SD, **Romero-Sandoval EA**, Fonseca M. Methods and Protocols for Translatable Rodent Models of Postsurgical Pain. *Methods in Cell Biology* on “Inflammation, Infection and Injury” 2022;168:249-276. doi: 10.1016/bs.mcb.2021.12.018
56. Pennypacker SD, Fonseca M, Morgan JW, Dougherty PM, Cubillos-Ruiz JR, Strowd RE, **Romero-Sandoval EA**. Methods and Protocols for Chemotherapy Induced Peripheral Neuropathy (CIPN) Mouse Models. *Methods in Cell Biology* on “Inflammation, Infection and Injury” 2022;168:277-298. doi: 10.1016/bs.mcb.2021.12.019
57. Chang-Suk Chae, Tito A. Sandoval, Sung-Min Hwang, Eun Sil Park, Paolo Giovanelli, Deepika Awasthi, Camilla Salvagno, Alexander Emmanuelli, Chen Tan, Vidyanath Chaudhary, Julia Casado, Andrew V. Kossenkov, Minkyung Song, Franck J. Barrat, Kevin Holcomb, **E. Alfonso Romero-Sandoval**, Dmitriy Zamarin, David Pépin, Alan D. D’Andrea, Anniina Färkkilä and Juan R. Cubillos-Ruiz. Tumor-derived Lysophosphatidic Acid Blunts Protective Type-I Interferon Responses in Ovarian Cancer. *Cancer Discovery* 2022 (in press).
58. MaryBeth Dobbins, Mannat Rakkar, Katharine Cunnane, Sarah D Pennypacker, Kimberly G Wagoner, Beth A Reboussin, E. Alfonso Romero-Sandoval. Association of Tetrahydrocannabinol Content and Price in Herbal Cannabis Products Offered by Dispensaries in California: A purview of consumers/patients. *Frontiers in Public Health*, June 17, 2022. DOI: 10.3389/fpubh.2022.893009.
59. Sarah D Pennypacker, Katharine Cunnane, Mary Catherine Cash, E. Alfonso Romero-Sandoval. Potency and Therapeutic THC and CBD ratios: U.S. Cannabis Markets Overshoot. *Frontiers in Pharmacology*, June 6, 2022. DOI: 10.3389/fphar.2022.921493.

INVITED PUBLICATIONS (EDITORIALLY REVIEWED):

1. Herrero JF, **Romero-Sandoval EA**, Gaitán G, Mazario J, Jacobs ALC. Efectos analgésicos de los nuevos inhibidores de las ciclooxigenasas: Evidencias experimentales y expectativas clínicas. *Revista de la Sociedad Española del Dolor*. 2003 10, 430-444. In Spanish.
2. Alkaitis MS, Ndong D, Landry RP, DeLeo JA, **Romero-Sandoval EA**. Reduced antinociceptive effect of repeated treatment with a cannabinoid receptor type 2 agonist in

cannabinoid-tolerant rats following spinal nerve transaction. Pain Management. Current Issues and Opinions. Gabor B Racz, Carl E. Noe, Editors. (ISBN 978-953-307-813-7). Peer-reviewed, Book Chapter 6. August 2011.

3. **Romero-Sandoval EA.** Depression and Pain: Does Ketamine Improve the Quality of Life of Patients in Chronic Pain by Targeting Their Mood? Anesthesiology. 2011 Oct;115(4):687-8
4. **Romero-Sandoval EA.** Phosphatases and Glia. Encyclopedia of Pain, 2nd Edition. 2013. Gerald F. Gebhart, Robert F. Schmidt, Editors. Book chapter. doi.org/10.1007/978-3-642-28753-4_4919. ISBN 978-3-642-28754-1.
5. **Romero-Sandoval EA.** Peripheral benzodiazepine receptors: are they potential biomarkers for glial activation in pain states? Eur J Pain. 2013 May;17(5):635-7.
6. **Romero-Sandoval EA, Sweitzer SM.** Nonneuronal Central Mechanisms of Pain. In Theodore Price, Greg Dussor, editors: Molecular and Cell Biology of Pain, Vol 131, PMBTS, UK: Academic Press, 2015, pp. 325-358. Book Chapter.
7. **Romero-Sandoval EA, Alvarado-Vazquez, PA, Herrero Gonzales JF.** Master en Neurociencia Experimental y Clínica, 6a. Edición (Experimental and Clinical Neuroscience MS, 6th Edition). VI. Sistemas Sensoriales (Sensory Systems). Somestesia: Mecanorrecepción, Termorrecepción y Nocicepción (Somesthesia: Mechanoception, Thermoception, and Nociception). 2021. Viguera Editores, SLU.

BOOKS:

1. Verification of Animal Pain Models by Reverse Translation. Robert M. Caudle, E. Alfonso Romero-Sandoval, Maree Therese Smith, Editors. Front Pharmacol. 2021. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88971-801-6

MISCELLANEOUS PUBLICATIONS:

1. Caudle RM, Smith MT, **Romero-Sandoval EA.** Editorial: Verification of Animal Pain Models by Reverse Translation. Front Pharmacol. 2021 Oct 8;12:778880.

PRESENTATIONS AT PROFESSIONAL MEETINGS:

1. Congress: Research Society on Marijuana Annual Meeting. July 22 – 24, 2022.
Title: **North Carolina Cannabidiol (CBD) program: analysis of marketing claims, type of products, and violations of FDA regulations**
Authors: Lindsay Aman, Allison J Lazard, Beth A Reboussin, Kimberly G Wagoner, E. Alfonso Romero-Sandoval
Sort of participation: Poster
2. Congress: World Congress on Pain (IASP). September 16 – 23, 2022.
Title: **Marijuana knowledge, attitudes, and perceptions: A comparative study between users and non-users with or without chronic pain**
Authors: MaryBeth Dobbins, Mannat Rakkar, Katharine Cunnane, Sarah Pennypacker, Kimberly G Wagoner, Beth A Reboussin, E. Alfonso Romero-Sandoval
Sort of participation: Poster
3. Congress: World Congress on Pain (IASP). September 16 – 23, 2022.

- Title: **IRE1 α -XBP1 pathway activation in leukocytes influences the development of behavioral hypersensitivity following partial sciatic nerve ligation (PSNL) in mice**
Authors: Oriana Gelblung, Miriam das Dores Medes Fonseca, James W. Morgan, E. Alfonso Romero-Sandoval
Sort of participation: Poster
4. Congress: US Association for the Study of Pain (USASP). May 18 – 21, 2022.
Title: **Hemp dispensaries in NC promote CBD to treat pain and offer low-CBD/high-price products.**
Authors: Lindsay Amann, Beth A. Reboussin, Kimberly G. Wagoner, E. Alfonso Romero-Sandoval
Sort of participation: Poster
Selected for oral presentation during the Substance Use and Addic2on SIG Meeting
5. Congress: Virtual World Congress on Pain (IASP). June 9 – 11, 16 – 18, 2021.
Speakers: Romero-Sandoval, Alfonso (organizer and chair), Cubillos-Ruiz, Juan (Weill Cornell Medicine, NY, USA), Schmidt, Manuela (University of Vienna, Austria)
Title: Endoplasmic Reticulum and mitochondrial dysfunction and pain
Sort of participation: Workshop
6. Congress: Virtual World Congress on Pain (IASP). June 9 – 11, 16 – 18, 2021.
Title: **Endoplasmic Reticulum Stress Sensor in Acute and Chronic Pain.**
Authors: Miriam das Dores Mendes Fonseca, Sahil Chopra, Perla Abigail Alvarado-Vazquez, Juan R. Cubillos-Ruiz, Edgar A. Romero-Sandoval
Sort of participation: Poster
7. Congress: Virtual World Congress on Pain (IASP). June 9 – 11, 16 – 18, 2021.
Title: **Impact of Community Characteristics on the Relationship between THC Potency and Price of Cannabis Products in California.**
Authors: MaryBeth Dobbins, Katharine Cunnane, Kimberly G. Wagoner, Beth A. Reboussin, Edgar A. Romero-Sandoval
Sort of participation: Poster
8. Congress: Virtual World Congress on Pain (IASP). June 9 – 11, 16 – 18, 2021.
Title: **Potency and Therapeutic Dosing of CBD and THC: Cannabis Markets Overshoot.**
Authors: Sarah D. Pennypacker, Katharine Cunnane, Edgar A. Romero-Sandoval
Sort of participation: Poster
9. Congress: Virtual US Association for the Study of Pain (USASP). December 9 – 11, 2020.
Title: **Effects of paclitaxel in mitochondrial function and cellular phenotype in human peripheral blood mononuclear cells and monocytes.**
Authors: Miriam Fonseca; James Morgan; Taylor Brooks; Thomas Lycan; Roy Strowd; Juan Cubillos-Ruiz; E. Alfonso Romero-Sandoval
Sort of participation: Poster
10. Congress: Virtual US Association for the Study of Pain (USASP). December 9 – 11, 2020.
Title: **IRE α -XBP1s activation in leukocytes is associated with the level of exposure to paclitaxel in CIPN patients**
Authors: James Morgan, Marybeth Dobbins, Miriam Fonseca, Sun Park, Christine Ahn, Angela Niehaus, Kelsey Shore, Alexandra Thomas, Nancy Avis, Taylor Brooks, Yusuke Shiozawa, Roy Strowd, Juan Cubillos-Ruiz, Edgar-Alfonso Romero-Sandoval
Sort of participation: Poster

11. Congress: Virtual US Association for the Study of Pain (USASP). December 9 – 11, 2020.
Title: **Association of THC Content and Price in Herbal Cannabis products by Dispensaries in California**
Authors: Sarah D. Pennypacker, Katharine Cunnane, E. Alfonso Romero-Sandoval.
Sort of participation: Poster
12. Congress: Virtual US Association for the Study of Pain (USASP). December 9 – 11, 2020.
Title: **CBD and THC: Does the market reflect therapeutic dosing?**
Authors: MaryBeth Dobbins, Katharine Cunnane, E. Alfonso Romero-Sandoval.
Sort of participation: Poster
13. Congress: 3rd Meeting of the Federation of Latin American and Caribbean Neuroscience Societies (FALAN). Belem, Brazil, September 14 - 17, 2020.
Speakers: Coronel MF (Chair, Universidad Austral, Buenos Aires, Argentina), Brumovsky P (Universidad Austral, Buenos Aires, Argentina), Romero-Sandoval EA (WFU), Matar Cunha T (University of Sao Paulo, Brazil).
Title: Cannabis and Pain, a Challenge for Modern Medicine and Pharmacy
Sort of participation: Workshop (accepted) - Meeting canceled due to COVID-19.
14. Congress: 17th World Congress on Pain (IASP). Amsterdam, Netherlands, Aug 4 – 8, 2020.
Speakers: Romero-Sandoval EA (organizer and chair), Cubillos-Ruiz JR (Weill Cornell Medicine, NY, USA), Flatters S (King's College London, UK)
Title: Endoplasmic Reticulum and mitochondrial dysfunction and pain
Sort of participation: Workshop (accepted) - Meeting canceled due to COVID-19.
15. Congress: 17th World Congress on Pain (IASP). Amsterdam, Netherlands, Aug 4 – 8, 2020
Title: **Endoplasmic Reticulum Stress Sensor in Acute and Chronic Pain.**
Authors: Miriam das Dores Mendes Fonseca, Sahil Chopra, Perla Abigail Alvarado-Vazquez, Juan R. Cubillos-Ruiz, Edgar A. Romero-Sandoval
Sort of participation: Poster (accepted) - **Meeting canceled due to COVID-19.**
16. Congress: 15th Synapse Conference 2020. Longwood University, Farmville, VA. March 28, 2020.
Title: Price and THC content correlation in cannabis products offered online in dispensaries from California.
Authors: Maybeth Dobbins, Katharine Cunnane, E. Alfonso Romero-Sandoval.
Sort of participation: Poster (accepted) - **Meeting canceled due to COVID-19.**
17. Congress: 14th Synapse Conference 2019. High Point University, High Point, NC. April 13, 2019.
Title: Studying pain neural circuits with viral vector rAAV2-retro in the brain.
Authors: Katharine Cunnane, Perla Abigail Alvarado-Vazquez, Young Gwak, Christopher Peters, E. Alfonso Romero-Sandoval, Thomas Jeff Martin, James Eisenach
Sort of participation: Poster
18. Congress: Spring Pain 2019. **Milwaukee, WI**, April 2-3, 2019.
Title: Role of macrophage CD163 in persistent postoperative pain and wound healing.
Authors: Romero-Sandoval EA; Sort of participation – Symposium: Neuroimmune Regulation in Pain. Chair and Lecture/Speaker Other speakers: Dr. Allan Bausbam (UCSF, CA), Annemieke Kavelaars (MD Anderson, TX) and Dr. Peter Grace (MD Anderson, TX)
19. Congress: American Pain Society 38th Scientific Meeting. **Milwaukee, WI**, April 3-6, 2019.

- Title: Substance P and macrophage's phenotype.
Authors: Romero-Sandoval EA
Sort of participation – Symposium: New insights in the peripheral role of neuropeptides in pain states. Chair and Lecture/Speaker.
Other speakers: Dr. Mario D. Boada (WFU) and Dr. David Clark (Stanford, CA)
20. Congress: American Pain Society 38th Scientific Meeting. **Milwaukee, WI**, April 3-6, 2019.
Title: Studying pain neural circuits with viral vector rAAV2-retro in the brain.
Authors: Katharine Cunnane, Perla Abigail Alvarado-Vazquez, Young Gwak, Christopher Peters, E. Alfonso Romero-Sandoval, Thomas Jeff Martin, James Eisenach
Sort of participation: Poster
21. Congress: 13th Synapse Conference 2018. High Point University, High Point, NC. April 14, 2018.
Title: Genetic induction of CD163 in macrophages decreases pain and inflammation and promotes wound healing.
Authors: Katie Cunnane, David Wilson Ferreira, Abigail Alvarado-Vazquez, EA Romero-Sandoval
Sort of participation: Poster
22. Congress: American Pain Society 37th Scientific Meeting. **Anaheim CA**, March 4-6, 2018.
Title: Macrophage-directed gene modulation as a therapeutic approach to induce an efficient pain resolution.
Authors: Romero-Sandoval EA
Sort of participation – Symposium: Exploiting Cellular and Molecular Mechanisms of Neuroinflammatory Milieu for Chronic Pain. Lecture/Speaker
23. Congress: American Pain Society 37th Scientific Meeting. **Anaheim CA**, March 4-6, 2018.
Title: Identification of pain and wound healing-related genes associated with CD163 in macrophages from diabetic patients.
Authors: Alvarado A, Ferreira D, Romero-Sandoval EA
Sort of participation: Poster - Accepted
24. Congress: American Pain Society 36th Scientific Meeting. **Pittsburgh, PA**, May 17-20, 2017.
Title: CD163 in macrophages from diabetic patients and its role in the inflammatory response of THP-1 and primary human macrophages.
Authors: Alvarado A, Grosick R, Romero-Sandoval EA
Sort of participation: Poster
25. Congress: American Pain Society 36th Scientific Meeting. **Pittsburgh, PA**, May 17-20, 2017.
Title: Optimizing an *in vitro* model using THP-1 macrophages to study pain, inflammation, and wound healing in the context of diabetes.
Authors: Grosick R, Alvarado A, Romero-Sandoval EA.
Sort of participation: Poster.
26. Congress: American Pain Society 36th Scientific Meeting. **Pittsburgh, PA**, May 17-20, 2017.
Title: Macrophage directed ED2/CD163 gene therapy using nanotechnology prevents spontaneous pain in a rat model of persistent postoperative pain.
Authors: Ferreira D, Alvarado A, Mattar-Cunha T, Romero-Sandoval EA
Sort of participation: Poster.
27. Congress: 15th ASRA Annual Pain Medicine Meeting. San Diego, CA, Nov 17 – 19, 2016.
Authors: Romero-Sandoval EA
Title: Basic Sciences and Novel Analgesics/ Mechanisms Underlying the Transition from Acute to Chronic Postoperative Pain

Sort of participation: Invited Speaker – Refresher Course

28. Congress: 15th ASRA Annual Pain Medicine Meeting. San Diego, CA, Nov 17 – 19, 2016.
Authors: Romero-Sandoval EA
Title: Dorsal Root Ganglion (DRG) Is Back: New Treatment Target/ Chronification of Pain: the Role of Neuroimmune Activation
Sort of participation: Invited Speaker – Refresher Course
29. Congress: 15th ASRA Annual Pain Medicine Meeting. San Diego, CA, Nov 17 – 19, 2016.
Authors: Romero-Sandoval EA
Title: Cannabinoids for Pain: Science, Politics, and Clinical Applications/ Recommendations for Clinical Practice and Research on Cannabinoids
Sort of participation: Invited Speaker – Parallel Session (PS-1a)
30. Congress: 16th World Congress on Pain (IASP). Yokohama, Japan, Sept 26 – 30, 2016.
Authors: Ferreira DW, Ulecia-Moron C, Moracho-Vilrriales C, Grosick R, Alvarado A, Romero-Sandoval EA
Title: CD163 gene therapy in macrophages using nanotechnology improves wound healing in a 3D human skin model: Potential therapy for chronic postoperative pain
Sort of participation: Poster
31. Congress: 16th World Congress on Pain (IASP). Yokohama, Japan, Sept 26 – 30, 2016.
Authors: Carolina Moracho-Vilrriales, Annie Bailey, Jimmy Pruitt III, Tiffany Threatt, Sarah Wagner, E.Alfonso Romero Sandoval
Title: Correlation of HbA1c, cholesterol and LDL with painful diabetic neuropathy: A study from a rural area of South Carolina.
Sort of participation: Poster
32. Congress: SC INBRE Symposium. Columbia, SC, August 27, 2016.
Authors: Rachel Grosick, Abigail Alvarado-Vazquez, E. Alfonso Romero-Sandoval
Title: Optimizing an *in vitro* model using human macrophages to study diabetes.
Sort of participation: Poster
33. Congress: SC INBRE Symposium. Columbia, SC, August 27, 2016.
Authors: Abigail Alvarado-Vazquez, Rachel Grosick, Rooksana Noorai, Christopher Sasaki, E. Alfonso Romero-Sandoval
Title: Finding CD163 dependent pathways in diabetic macrophages using bioinformatics .
Sort of participation: Poster
34. Congress: American Pain Society 35th Annual Scientific Meeting. **Austin, TX**, May 11-14, 2016.
Title: Future directions for translational research.
Sort of participation – **Symposium**: Role of cannabinoids in chronic pain: translational approaches.
Sort of participation: Lecture/Speaker
35. Congress: American Pain Society 35th Annual Scientific Meeting. **Austin, TX**, May 11-14, 2016.
Title: Interaction among keratinocytes, fibroblasts and CD163-overexpressing macrophages for a more efficient wound healing process.
Authors: Ferreira DW, Alvarado A, Ulecia-Moron C, Romero-Sandoval EA.
Sort of participation: Poster.
36. Congress: American Pain Society 35th Annual Scientific Meeting. **Austin, TX**, May 11-14, 2016.

- Title: Increase of anti-inflammatory cytokines in human macrophages that overexpress CD163 under different pro-inflammatory conditions.
Authors: Alvarado A, Bernal L, Paige C, Ferreira D, Romero-Sandoval EA.
Sort of participation: Poster.
37. Congress: The Pain Society of the Carolinas Annual Meeting & Scientific Sessions 2015. Greenville, SC, October 23-25, 2015.
Title: Induction of a M2 phenotype in human macrophages via CD163 gene induction using nanotechnology.
Authors: Alvarado-Vazquez A, Bernal L, Paige C, Romero-Sandoval EA.
Sort of participation: Poster.
38. Congress: The Pain Society of the Carolinas Annual Meeting & Scientific Sessions 2015. Greenville, SC, October 23-25, 2015.
Title: Functional blockade of CD163 receptor overexpressed in macrophages impairs the wound healing process.
Authors: Ferreira DW, Alvarado A, Ulecia-Moron C, Romero-Sandoval EA.
Sort of participation: Poster.
39. Congress: The Pain Society of the Carolinas Annual Meeting & Scientific Sessions 2015. Greenville, SC, October 23-25, 2015.
Title: Association of HbA1c and painful diabetic neuropathy in a rural area diabetic population of South Carolina.
Authors: Moracho-Vilrriales C, Prestia J, Pruitt III J, Threatt T, Wagner S, Romero-Sandoval EA.
Sort of participation: Poster.
40. Congress: The Pain Society of the Carolinas Annual Meeting & Scientific Sessions 2015. Greenville, SC, October 23-25, 2015.
Title: Association of painful diabetic neuropathy with diabetic comorbidities and treatment in a rural area diabetic population of South Carolina.
Authors: Pruitt III J, Prestia J, Threatt T, Wagner S, Romero-Sandoval EA.
Sort of participation: Poster.
41. Congress: American Academy of Pain Medicine 31th Annual Scientific Meeting. **Palm Spring, CA**, U.S.A., February 18-21, 2016.
Authors: E. Alfonso Romero-Sandoval
Title: Medical Marijuana and Opiates: Indications for Use.
Sort of participation: **Symposium** – Practice Issues and Professional Development.
Lecture/Speaker
42. Congress: 10th Synapse Conference 2015. UNC Asheville, NC. March 28, 2015.
Title: Targeting macrophages in vitro to develop a nanotechnology-based cell directed gene therapy for the prevention of chronic postoperative pain.
Authors: Laura Bernal, Abigail Alvarado, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster
43. Congress: 10th Synapse Conference 2015. UNC Asheville, NC. March 28, 2015.
Title: ED2/CD163 gene induction using nanotechnology for a cell directed gene therapy for the treatment of pain
Authors: Candler Paige, Abigail Alvarado, Laura Bernal, Marina Leon, Bailey Hill, Christian Ndong, E. Alfonso Romero-Sandoval
Sort of participation: Poster

44. Congress: American Academy of Pain Medicine 30th Annual Scientific Meeting. **National Harbor, MD**, U.S.A., March 19-22, 2015.
Title: Targeting macrophages in vitro to develop a nanotechnology-based cell directed gene therapy for the prevention of chronic postoperative pain.
Authors: Laura Bernal, Abigail Alvarado, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster
45. Congress: American Academy of Pain Medicine 34th Annual Scientific Meeting. **National Harbor, MD**, U.S.A., March 19-22, 2015.
Authors: E. Alfonso Romero-Sandoval
Title: Basic Science of Medical Cannabinoids: Understanding the Building Blocks.
Sort of participation: **Symposium** – Clinical Pearls: Medical Marijuana and Cannabinoids
Lecture/Speaker
46. Congress: American Pain Society 34th Annual Scientific Meeting. **Palm Springs, CA**, U.S.A., May 13-16, 2015.
Title: Induction of a M2 phenotype in human macrophages via CD163 gene induction using nanotechnology.
Authors: Abigail Alvarado, Candler Paige, Laura Bernal, E. Alfonso Romero-Sandoval
Sort of participation: Poster
47. Congress: American Pain Society 34th Annual Meeting. **Palm Springs, CA**. May 13-16, 2015.
Title: Reduction of cytokine levels in human macrophages over-expressing CD163.
Authors: Candler Paige, Laura Bernal, Abigail Alvarado, E. Alfonso Romero-Sandoval
Sort of participation: Poster
48. Congress: The Pain Society of the Carolinas Annual Meeting & Scientific Sessions 2014. Charleston, SC, December 5-7 2014.
Title: ED2/CD163 gene induction using nanotechnology for a cell directed gene therapy for the treatment of pain.
Authors: Candler Paige, Abigail Alvarado, Laura Bernal, Marina Leon, Bailey Hill, Christian Ndong, Alfonso Romero-Sandoval
Sort of participation: Poster and oral presentation.
49. Congress: 15th World Congress on Pain (IASP). Buenos Aires, Argentina, Oct 6 –11, 2014.
Authors: Sladjana Skopelja, Madhurima Saha, Brenna Liponis, Elena Martinez, E. Alfonso Romero-Sandoval
Title: Mitogen activated protein kinase phosphatase-3 (MKP-3) in the surgical tissue is necessary for the resolution of postoperative pain in mice
Sort of participation: Poster
50. Congress: 15th World Congress on Pain (IASP). Buenos Aires, Argentina, Oct 6 –11, 2014.
Authors: Candler Paige, Christian Ndong, Marina Leon, Bailey Hill, E. Alfonso Romero-Sandoval
Title: ED2/CD163 gene induction shifts monocyte cellular phenotype from pro-inflammatory to anti-inflammatory
Sort of participation: Poster
51. Conference: Summer Fellows and Pharmacy Research Summer Internship 2014. **Clinton, SC**, U.S.A., July 22, 2014.
Title: Efficacy of mannosylated polyethylenimine for the induction of CD163 on THP-1 Macrophages
Authors: Abigail Alvarado, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster

52. Conference: Summer Fellows and Pharmacy Research Summer Internship 2014. **Clinton, SC**, U.S.A., July 22, 2014.
Title: Cytokine release profile in CD163-overexpressing THP-1 macrophages
Authors: Laura Bernal, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster
53. Conference: Summer Fellows and Pharmacy Research Summer Internship 2014. **Clinton, SC**, U.S.A., July 22, 2014.
Title: Cytokine mRNA Levels in Macrophages Over Expressing CD163
Authors: Bailey Hill, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster
54. Congress: American Pain Society 33th Annual Scientific Meeting. **Tampa, FL**, U.S.A., Apr 30-May 3, 2014.
Sort of participation – **Workshop**: Herbal Marijuana in Clinical Practice: Optimizing Policies and Outcomes.
Sort of participation: Lecture/Speaker
55. Congress: American Pain Society 33rd Annual Scientific Meeting. **Tampa, FL**, U.S.A., Apr 30-May 3, 2014.
Title: Gene induction using nanotechnology: Translation to human cells.
Authors: Candler Paige, Marina Leon, Bailey Hill, E. Alfonso Romero-Sandoval
Sort of participation: Poster
56. Congress: American Pain Society 33rd Annual Meeting. **Tampa, FL**, Apr 30-May 3, 2014.
Title: Spinal cord MKP-3/MAPK signaling impairment results in the transition from acute to chronic postoperative pain.
Authors: Madhurima Saha, Sladjana Skopelja, Brenna S. Liponis, Elena Martinez, E. Alfonso Romero-Sandoval
Sort of participation: Poster
57. Congress: 9th Synapse Conference 2014. UNC Asheville, NC. March 29, 2014.
Title: Assessment of Potential in Vitro Toxicity of Nanoparticles (Mannosilated Polyethylenimine) on THP-1 Macrophages.
Authors: Marina Leon, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster
58. Congress: 9th Synapse Conference 2014. UNC Asheville, NC. March 29, 2014.
Title: Assessment of pro-inflammatory factor expression on human THP-1 macrophages.
Authors: Bailey Hill, Candler Paige, E. Alfonso Romero-Sandoval
Sort of participation: Poster
59. Congress: The Pain Society of the Carolinas Annual Meeting & Scientific Sessions 2013. Asheville, NC, November 1-3, 2013.
Title: Implication of the phosphatase MKP-3 in the transition from acute to chronic postoperative pain.
Authors: Skopelja S, Saha M, Liponis BS, Martinez E, Romero-Sandoval EA.
Sort of participation: Poster and oral presentation. **Prize to the Best Oral Presentation.**
60. Congress: American Pain Society 32nd Annual Scientific Meeting. **New Orleans, LA**, U.S.A., May 8-11, 2013.
Sort of participation – **Symposium**: Rita Allen Foundation Scholars in Pain: Frontiers in Basic Pain Research. Lecture.
Organizers: Dr. E. Alfonso Romero-Sandoval, and Dr. Yuanxiang Tao

61. Congress: 27th Annual Neuroscience Day at Dartmouth. Hanover, NH, April 5th, 2013
Title: Mitogen activated protein kinase phosphatase-3 (MKP-3) drives the resolution of postoperative allodynia in mice by regulating spinal p-p38.
Authors: Sladjana Skopelja, Madhurima Saha, Elena Martinez, E. Alfonso Romero-Sandoval
Sort of participation: Poster
62. Congress: 27th Annual Neuroscience Day at Dartmouth. Hanover, NH, April 5th, 2013
Role of Peripheral Mitogen Activated Protein Kinase Phosphatase-3 (MKP-3) at the Site of Surgical Incision in the Resolution of Postoperative Pain in Mice
Authors: Brenna Liponis, Sladjana Skopelja, Daniel Alvarez, Madhurima Saha, E. Alfonso Romero-Sandoval.
Sort of participation: Poster
63. Congress: 8th Synapse/4th South East Neuroscience Conference 2013. USC Columbia, SC. March 23-24, 2013.
Title: Mitogen activated protein kinase phosphatase-3 (MKP-3) is necessary for postoperative allodynia resolution in mice.
Sort of participation: Lecture
64. Congress: Society for Neuroscience, 42th Neuroscience Annual Meeting, October 13-17, 2012 New Orleans, LA.
Authors: M. Saha, D. Alvarez, E. Martinez, E.A. Romero-Sandoval.
Title: Mitogen activated protein kinase phosphatase-3 (MKP-3) is necessary for postoperative allodynia resolution in mice.
Sort of participation: Poster
65. Congress: 14th World Congress on Pain (IASP). Milan, Italy, Aug 27 – 31, 2012.
Authors: Landry R.P., Martinez E., DeLeo J.A., Romero-Sandoval E.A.
Title: Spinal cannabinoid receptor type 2 and spinal phosphatases in neuropathic pain
Sort of participation: Poster.
66. Congress: American Pain Society 31st Annual Scientific Meeting. **Honolulu, HI**, U.S.A., May 16-19, 2012.
Authors: E.A. Romero-Sandoval, M. Saha, C. Ndong, R.P. Landry and J.A. DeLeo.
Title: Role of spinal phosphatases in the resolution of postoperative pain.
Sort of participation Invited Speaker – Symposium: Rita Allen Foundation Scholars in Pain: Frontiers in Basic Pain Research – Organizer: Dr. Diana Bautista, and Dr. Seena Ajit.
67. Congress: Society For Neuroscience, 41th Annual Meeting. Washington, DC, Nov. 13 - 17 2011.
Authors: C. Ndong, R.P. Landry, J.A. DeLeo and E.A. Romero-Sandoval.
Title: In vivo spinal phosphatase gene transfection and overexpression in a model of neuropathic pain.
Sort of participation: Poster.
68. Congress: Poptech: World Rebalancing, Annual Meeting. Candem, ME, Oct. 19 – 23, 2011.
Invited by the Rita Allen Foundation to attend.
Sort of participation: Attendant.
69. Congress: LIV National Congress of Physiological Sciences (Mexico), León, Guanajuato, Mexico, September 10 - 14, 2011.
Authors: C. Ndong, R.P. Landry, J.A. DeLeo and E.A. Romero-Sandoval.
Title: Relevance of the cellular phenotype of glia in pain conditions.

- Sort of participation: Invited speaker – Symposium: Chronic Pain: Mechanisms and Perspectives.
70. Congress: XXIII Intl. Congress of the Medical Association of Huehuetenango (Guatemala), and Medical Association of Comitán, Chiapas (Mexico), Huhuetenango, Nov 18 -20, 2010.
Authors: M.S. Alkatis, R.P. Landry, J.A. DeLeo and E.A. Romero-Sandoval.
Title: Present and future of analgesia
Sort of participation: Invited speaker – Plenary Lecture.
71. Congress: Society For Neuroscience, 40th Annual Meeting. San Diego, CA, Nov. 13 - 17 2010.
Authors: C. Ndong, R.P. Landry, J.A. DeLeo and E.A. Romero-Sandoval.
Title: Phosphatases as regulators of algescic factors in glial cells
Sort of participation: Poster.
72. Congress: 13th World Congress on Pain (IASP). Montreal, Canada, Aug 29 – Sep 2, 2010.
Authors: E.A. Romero-Sandoval, R.J. Horvath, R.P. Landry and J.A. DeLeo.
Title: Cannabinoid and neuronal-glia interactions in neuropathic pain
Sort of participation: Speaker and Workshop Organizer: Glial Modulating Targets for the Treatment of Pain.
73. Congress: Spring Pain Conference. **Grand Cayman, B.W.I.**, April 17-24, 2010.
Authors: E.A. Romero-Sandoval, R.P. Landry and J.A. DeLeo.
Title: Perivascular cells and CB receptors.
Sort of participation Invited Speaker – Workshop: A Multipartite Synapse in Understanding Pain Mechanisms – Organizer: Dr. Joyce A. DeLeo.
74. Congress: American Pain Society 29th Annual Scientific Meeting. **Baltimore, MD**, May 6-8, 2010.
Authors: C. Ndong, R.P. Landry, J.A. DeLeo and E.A. Romero-Sandoval
Title: Modulation of glial phenotype by phosphatases and cannabinoid receptor type 2 agonists.
Sort of participation Invited Speaker – Workshop: From Molecule to Disease: the Molecular Dynamics of Inflammatory Pain – Organizer: Dr. Luda Diatchenko.
75. Congress: American Pain Society 29th Annual Scientific Meeting. **Baltimore, MD**, May 6-8, 2010.
Authors: E.A. Romero-Sandoval, R.P. Landry and J.A. DeLeo.
Title: Role of spinal phosphatases in cannabinoid-induced antinociception in a rodent neuropathic pain model.
Sort of participation: Speaker and poster.
76. Congress: XXIX Annual Meeting and X International Congress of Pain, Queretaro, Mexico, November 11-14, 2009.
Authors: E.A. Romero-Sandoval, R.P. Landry, J.A. DeLeo.
Title: Potential analgesic effects of CB2 receptor agonists by actions on spinal microglia following peripheral nerve injury
Sort of participation: Invited speaker – Plenary Session.
77. Congress: Annual Meeting and X International Congress of Pain, Queretaro, Mexico, November 11-14, 2009.
Authors: E.A. Romero-Sandoval, R.P. Landry, J.A. DeLeo.
Title: Role of selective and non-selective agonists in the modulation of microglial reactivity
Sort of participation: Invited speaker – Plenary Session.

78. Congress: Society for Neuroscience, 39th Annual Meeting. Chicago, IL, U.S.A., Oct. 17 – 21 2009.
Authors: M.S. Alkaitis, E.A. Romero-Sandoval, R.P. Landry, J.A. DeLeo.
Title: The Role of Immune-Mediated Endocannabinoid Signaling in the Resolution of Acute Post-Operative Pain
Poster Presentation: Selected as "Hot Topic" for Neuroscience 2009 Media Materials.
79. Congress: 4th Gordon Research Conference on Cannabinoid Function in The CNS. University of New England, Biddeford, ME, U.S.A., Aug 2-7, 2009
Authors: E.A. Romero-Sandoval, R.J. Horvath, R.P. Landry and J.A. DeLeo.
Title: Cannabinoid receptors differentially modulate in vitro microglial phosphatase/kinase pathway and tolerance in neuropathic pain.
Sort of participation: Poster
80. Congress: 8th Dutch **Endo-Neuro-Psycho** Meeting. Doorwerth, Netherlands, Jun 3-5, 2009
Authors: E.A. Romero-Sandoval and J.A. DeLeo.
Title: Cannabinoid and Neuronal-Glial Interactions in Acute and Chronic Pain.
Sort of participation: Invited Main Speaker - Workshop: Glia in neuropathy
Organizers: Dr. Ronald Deumens & Dr. Elly Hol.
81. 4th Annual Symposium on Advances in Pain Research. NIH, Bethesda, MD. U.S.A. May 26, 2009.
Authors: E.A. Romero-Sandoval, N. Nutile-McMenemy and J.A. DeLeo.
Title: Spinal cannabinoid receptor type 2 activation reduces neuropathic pain hypersensitivity in animals with cannabinoid tolerance.
Sort of participation: Invited Sponsored Poster - Pain Consortium Representatives.
82. Congress: American Pain Society 28th Annual Scientific Meeting. **San Diego**, CA U.S.A., May 7-9, 2009.
Authors: E.A. Romero-Sandoval and J.A. DeLeo.
Title: Cannabinoid and Glial Modulation: Role in Analgesia and Tolerance
Sort of participation: Invited Speaker – Organizer: Basic Science Special Interest Group of the American Pain Society.
83. Congress: American Society for Neurochemistry Annual Meeting, Charleston, SC U.S.A. 7-11 March 2009
Authors: E.A. Romero-Sandoval, R.P. Landry and J.A. DeLeo.
Title: Differential effects of cannabinoids in microglial function and neuropathic pain behavior
Sort of participation: Invited Speaker – Workshop: Glial-Neuronal Interactions in Pain Generation – Organizer: Dr. Joyce DeLeo.
84. Congress: Society for Neuroscience, 38th Annual Meeting. Washington DC, Nov 15–19, 2008
Authors: E.A. Romero-Sandoval, N. Nutile-McMenemy and J.A. DeLeo.
Title: Spinal cannabinoid receptor type 2 activation reduces neuropathic pain hypersensitivity in animals with cannabinoid tolerance.
Sort of participation: Poster.
85. Congress: 12th World Congress on Pain (IASP). Glasgow, Scotland, UK, 17-22 August 2008
Authors: E.A. Romero-Sandoval and J.A. DeLeo.
Title: Cannabinoid receptors differentially modulate microglial function and neuropathic pain behavior.
Sort of participation: Invited Speaker – Workshop: Neuroimmune Signaling in Young and Adult Pain Pathways – Organizer: Dr. Maria Fitzgerald. Online
86. Congress: Society for Neuroscience, 37th Annual Meeting. San Diego, CA, Nov. 3th – 7th 2007

Authors: E.A. Romero-Sandoval, N. Nutile-McMenemy and J.A. DeLeo.
Title: In vivo detection of cannabinoid receptor type 2 in spinal microglia and perivascular cells: Implications for glial activation in neuropathic pain.
Sort of participation: Poster. Online

87. Congress: 17th Neuropharmacology Conference, Cannabinoid Signaling in the Nervous System, October 31st - November 2nd, 2007, San Diego, USA
Authors: E.A. Romero-Sandoval, N. Nutile-McMenemy and J.A. DeLeo.
Title: Microglia Cannabinoid Receptor Type 2 Activation Reduces Cytokine and Nitric Oxide Production by Modulating Mitogen-Activated Protein Kinase-Phosphatase (MKP) and Extracellular Signal-Regulated Kinase (ERK).
Sort of participation: Poster
88. Congress: Society for Neuroscience, 36th Annual Meeting. Atlanta GA, Oct. 14th – 18th 2006
Authors: J.C. Eisenach and E.A. Romero-Sandoval.
Title: Spinal cannabinoid receptor type 2 activation reduces hypersensitivity and spinal cord microglial and astrocyte activation following incisional surgery.
Sort of participation: Poster
89. Congress: Society For Neuroscience, 36th Annual Meeting. Atlanta GA, Oct. 14th – 18th 2006
Authors: E.A. Romero-Sandoval, J. Wieseler-Frank, L.R. Watkins and J.C. Eisenach.
Title: Clonidine reduces hypersensitivity in sciatic neuritis by inducing apoptosis and changing immune response phenotype.
Sort of participation: Poster
90. Congress: Society for Neuroscience, 36th Annual Meeting. Atlanta GA, Oct. 14th – 18th 2006
Authors: Alique M, Romero-Sandoval EA, Herrero JF and Lucio J.
Title: All trans-retinoic acid (ATRA) up-regulates cyclooxygenase-2 (COX-2) and prostaglandin E2 (PGE2) production in SH-SY5Y cells. Role of retinoic acid receptors (RARs) and ERK1/2 pathways.
Sort of participation: Poster
91. Congress: Society for Neuroscience, 35th Annual Meeting. Washington DC, Nov. 12 – 16, 2005
Authors: E.A. Romero-Sandoval and J.C. Eisenach.
Title: Clonidine reduces hypersensitivity, cytokine production capability of leukocytes, macrophages and lymphocytes proportion and their TNF alpha content in sciatic neuritis.
Sort of participation: Poster communication.
Program No. 293.24. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005. Online
92. Congress: Society For Neuroscience, 35th Annual Meeting. Washington DC, Nov. 12 – 16, 2005
Authors: C. Molina, M. Alique, E.A. Romero-Sandoval, J. Lucio, J.F. Herrero.
Title: Retinoic acid enhances nociceptive responses after oral and intrathecal administration
Sort of participation: Poster communication.
Program No. 511.26. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005. Online.
93. Congress: North Carolina and South Carolina Societies of Anesthesiologist, Fall Session XXV, Asheville, NC U.S.A., Sept. 16 – 18 2005
Authors: E.A. Romero-Sandoval and J.C. Eisenach.
Title: Alpha 2-Adrenoceptor stimulation blocks neuritis induced pain by transforming the immune response.
Sort of participation: Invited Speaker

94. Congress: Society for Neuroscience, 34rd Annual Meeting. San Diego, Oct. 23rd – 27th 2004
Authors: E.A. Romero-Sandoval and J.C. Eisenach
Title: Clonidine and sciatic neuritis: Effects on hypersensitivity and cytokine expression
Sort of participation: Poster
95. Congress: Federation of European Neuroscience Societies, 4th Forum of European Neuroscience, Lisbon, Portugal, July 10th-14th 2004.
Authors: Carlos Molina, E. Alfonso Romero-Sandoval, M. Alique, V. Moreno-Manzano, F.J. Lucio and Juan F. Herrero
Title: The oral administration of retinoic acid enhances nociceptive withdrawal reflexes and the expression of the COX-2 enzyme
Sort of participation: Poster
96. Congress: Society for Neuroscience, 33rd Annual Meeting. New Orleans, Nov 8th–12th 2003
Authors: G. Gaitan, E. Alfonso Romero-Sandoval y Juan F. Herrero.
Title: The antinociceptive activity of Nitroparacetamol (NCX-701) is located in the spinal cord and increases the potency and duration of the mu-opiate fentanyl antinociception.
Sort of participation: Poster
97. Congress: X Congress of Neuroscience Spanish Society. Lleida, Spain, Sept. 6th - 9th 2003.
Authors: E. Alfonso Romero-Sandoval and Juan F. Herrero.
Title: Implicación del ácido retinoico en el sistema nociceptivo.
Sort of participation: Poster
98. Joint Meeting of The Spanish Physiological Society and The Physiological Society. Puerto de la Cruz, Tenerife, Spain, Feb. 13th – 17th 2003.
Authors: E. A. Romero-Sandoval and Juan F. Herrero.
Title: The effect of sham and full spinalization on the systemic potency of the NO-releasing NSAID NCX-701 (Nitroparacetamol) in rat spinal nociceptive reflexes and wind-up.
Sort of participation: Poster communication.
Publication: Journal of Physiology, P-118, 2003.
99. Society For Neuroscience, 32nd Annual Meeting. Orlando, Florida, Nov. 2nd-7th 2002.
Authors: E. A. Romero-Sandoval, Gema Gaitan and Juan F. Herrero.
Title: Antinociceptive effects of NO-paracetamol and paracetamol in spinal cord reflexes and wind-up. Enhancement of mu-opioid analgesia.
Sort of participation: Poster communication.
Publication: Society For Neuroscience, Abstracts 350.8.
100. IX Congress Neuroscience Spanish Society. Santiago de Compostela, Spain, Sept. 8-12 2001.
Authors: E. A. Romero-Sandoval, Javier Mazarío y Juan F. Herrero.
Title: Comparación del efecto analgésico de paracetamol y NO-paracetamol en Unidades Motoras de ratas.
Sort of participation: Poster communication.
Publication: Revista de Neurología 2001;33(9):893.
101. Congress: 5th World Congress on Inflammation, Edinburgh, Scotland, Sept. 22nd – 26th 2001.
Authors: E. A. Romero-Sandoval, Javier Mazarío y Juan F. Herrero.
Title: Comparison of the analgesic effect of paracetamol and NCX701 (no-paracetamol) in rat single motor units.
Sort of participation: Poster communication (**3rd place in “Best Poster competition”**).
Publication: Inflammation Research, supplement 3, Vol. 50 pp S211, Sept. 2001.

INVITED EXTRAMURAL PRESENTATIONS AND SEMINARS:

NATIONAL SPEAKER

1. 11th ANNUAL SYMPOSIUM IN CURRENT TRENDS IN DRUG ABUSE RESEARCH, NORTHEASTERN UNIVERSITY - CENTER OF DRUG DISCOVERY. Boston, MA. May 17, 2013.
Title: Cannabinoids and Pain: Physiology, Pathophysiology, and Pharmacology
Keynote Speaker
2. RITA ALLEN FOUNDATION 2013 MEETING. Norwalk, CT. June 17-19, 2013.
Title: MAP kinase phosphatase-3 (MKP-3) in the transition from acute to chronic postoperative pain
3. DEPARTMENT OF BIOLOGY, Newberry College, Newberry, SC, U.S.A. September 20, 2013.
Title: From marijuana to the pharmacology of cannabinoids.
4. EAST WHEELOCK RESIDENTIAL CLUSTER AT DARTMOUTH COLLEGE DISCUSSION MEETING. Hanover, NH, U.S.A. February 20th, 2015.
Title: Social and Scientific Aspects of Recreational and Medicinal Marijuana.
5. SYMPOSIUM OF YOUNG NEUROSCIENTISTS AND PROFESSORS OF THE SOUTH EAST (SYNPASE). Asheville, NC. March 28, 2015.
Title: Scientific Literature: How to Write and Interpret It.
6. SELF REGIONAL HEALTHCARE, FAMILY MEDICINE RESIDENT PROGRAM. Greenwood, SC. January 21, 2016.
Title: Association of Biomarkers and Painful Diabetic Neuropathy in a Diabetic Population of a SC Rural Area.
7. CHAMPLAIN VALLEY DISPENSARY (MEDICAL CANNABIS) EDUCATIONAL SERIES. Webinar to CVD staff. Vermont, November 19, 2015.
Title: Medical Marijuana: More is not always better.
8. 20TH ANNUAL PAIN MANAGEMENT SYMPOSIUM: ELECTIONEERING OR COMMON SENSE – VOTE THE CORRECT CHOICE FOR YOUR PATIENTS. Seattle, WA. October 14, 2016
Title: Cannabinoids for Pain: Beyond the Headlines. The Science.
Keynote Speaker
9. MD ANDERSON ANESTHESIOLOGY AND NEUROSCIENCE SEMINAR SERIES. Houston, TX. October 10, 2019.
Title: The Role of the ER Stress Sensor IRE1a-XBPs in Pain.
10. DUKE PAIN RESEARCH SEMINAR SERIES. Durham, NC. November 21, 2019.
Title: The Role of the ER Stress Sensor IRE1a-XBPs in Pain.
11. RITA ALLEN FOUNDATION PAIN SCHOLARS SEMINARS. Virtual, March 24, 2021
Title: Cell directed gene therapy for pain recovery after surgery and inflammation
12. THE AMERICAN SOCIETY OF PAIN AND NEUROSCIENCE (ASPN) – INNOVATIONS AND TREATMENT IN SPINE AND NERVE PAIN. Miami Beach, FL, July 22-25, 2021
Title: The Journal of Pain Research and ASPN.
13. UCONN CENTER FOR ADVANCEMENT IN MANAGING PAIN SEMINAR SERIES. Virtual. November 9, 2021.
Title: Cannabis potency and marketing strategies to target pain patients and minorities.
14. COVENANT HEALTH REGIONAL PAIN SYMPOSIUM. Lubbock, TX. December 3, 2021
Title: Current Cannabis and CBD market in the USA: Targeting Pain Patients.

15. INSTITUTE OF CANNABIS RESEARCH. Colorado State University, Pueblo, CO; Lambert Center for the Study of Medicinal Cannabis & Hemp Thomas Jefferson University. December 9, 2021
Title: The Legal Cannabis Market in the Context of Pain Patients and Community Factors.
16. PITTSBURGH CENTER FOR PAIN RESEARCH, UNIVERSITY OF PITTSBURGH. March 31, 2022.
Title: The Role of the ER Stress Sensor IRE1a/XBP1s in Pain.
17. MASSACHUSETTS COLLEGE OF PHARMACY AND HELATH SCIENCES, BOSTON, MA. SEMINAR SERIES. April 12, 2022.
Title: Clinical Implications of the Current Cannabis Market.

LOCAL/REGIONAL

Postdoctoral Fellow at WFU

1. North Carolina and South Carolina Societies of Anesthesiologist, Fall Session XXV. Asheville, NC, Sep 16 – 18, 2005
Title: Alpha 2-Adrenoceptor stimulation blocks neuritis induced pain by transforming the immune response.

Instructor at Dartmouth College School of Medicine

2. Pathophysiological Basis of Brain Diseases series: GLIAL-NEURONAL INTERACTIONS IN PAIN GENERATION. Neuroscience Center at Dartmouth, DHMC, Lebanon NH, U.S.A. Oct, 6, 2008.
Title: Potential Drug Targets in the nociceptive pathways and Cannabinoids.
3. RESEARCH CONFERENCE. Department of Anesthesiology, Dartmouth Medical School, DHMC, Lebanon NH, U.S.A. Oct 8, 2008.
Title: Cannabinoid and Glial Modulation: Role in Analgesia and Tolerance.
4. GLIAL-NEURONAL INTERACTIONS IN PAIN GENERATION. American Society for Neurochemistry Annual Meeting, Charleston, SC, Mar 7-11, 2009.
Title: Differential effects of cannabinoids in microglial function and neuropathic pain behavior

Assistant Professor at Dartmouth College School of Medicine

5. University of New England College of Osteopathic Medicine. Aug 5, 2009.
Title: The Role of Spinal Glial Cell-Mediated Endocannabinoid Signaling in the Resolution of Postoperative Pain.
6. PAIN MANAGEMENT FOR PRIMARY CARE 2009 CONFERENCES, Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire. Sep 29, 2009.
Title: Basic science of pain.
7. FROM MOLECULE TO DISEASE: THE MOLECULAR DYNAMICS OF INFLAMMATORY PAIN, American Pain Society 29th Annual Scientific Meeting. Baltimore, MD U.S.A., May 6-8, 2010.
Title: Modulation of glial phenotype by phosphatases and cannabinoid receptor type 2 agonists.
8. PATHOPHYSIOLOGICAL BASIS OF BRAIN DISEASES SERIES, Neuroscience Center at Dartmouth, DHMC, Lebanon NH, U.S.A. May 17, 2010.
Title: Evidence for a role of endocannabinoids, astrocytes and p38 phosphorylation in the resolution of postoperative pain.
9. PATHOPHYSIOLOGICAL BASIS OF BRAIN DISEASES SERIES, Neuroscience Center at Dartmouth, DHMC, Lebanon NH, U.S.A. Apr 18, 2011.

Title: Potential roles of spinal phosphatases in the mechanisms of pain generation following peripheral nerve injury.

10. PATHOPHYSIOLOGICAL BASIS OF BRAIN DISEASES SERIES, Neuroscience Center at Dartmouth, DHMC, Lebanon NH, U.S.A. Oct 8, 2012.
Title: MAP kinase phosphatases in pain states and their potential key role in the transition from acute to chronic postoperative pain

Associate Professor at Presbyterian College School of Pharmacy

11. PROGRAM IN NEUROSCIENCE, Wofford College, Spartanburg, SC, U.S.A. March 11, 2013.
Title: Mechanisms underlying the transition from acute to chronic postsurgical pain.
12. BOTANY CLASS, DEPARTMENT OF BIOLOGY. Presbyterian College, Clinton, SC. April 12, 2013.
Title: Medical Marijuana: Oxymoron? Cannabinoid Pharmacology and Clinical Promise.
13. FACULTY DEVELOPMENT COMMITTEE PCSP 2013 SERIES. Presbyterian College School of Pharmacy, Clinton, SC. June 7, 2013.
Title: Finding strategies for students engagement in the classroom
14. FACULTY DEVELOPMENT COMMITTEE PCSP 2013 SERIES. Presbyterian College School of Pharmacy, Clinton, SC. September 6, 2013.
Title: BRAD grant discussion: What is it? How does it affect me?
15. SUMMER FELLOWS RESEARCH PROGRAM, Presbyterian College, Clinton, SC, U.S.A. June 4, 2014.
Title: Recreational or Medicinal Legal Marijuana: The Science Behind It.
16. SUMMER FELLOWS RESEARCH PROGRAM, Presbyterian College, Clinton, SC. June 3, 2015.
Title: Nanotechnology to prevent chronic pain.
17. FACULTY DEVELOPMENT COMMITTEE PCSP 2015 SERIES. Presbyterian College School of Pharmacy, Clinton, SC. October 28, 2015.
Title: Developing your Research Project.
18. THE PAIN SOCIETY OF THE CAROLINAS. Annual Meeting & Scientific Sessions 2015. Greenville, SC, October 23, 2015.
Title: Central Sensitization.
19. PRESBYTERIAN COLLEGE HONORS DAY 2016. Clinton, SC. April 21, 2015.
Title: Celebrating The Hospitality Towards Curiosity.
Keynote Speaker

Associate Professor at WFU School of Medicine

20. CENTER FOR RESEARCH ON SUBSTANCE USE AND ADDICTION AT WFU – RETREAT. Winston Salem, NC. November 22, 2019
Title: Collaborative Efforts Under the Learning Healthcare System.
21. 2020 ADDICTION MEDICINE CONFERENCE. Asheville, NC. May 2, 2020.
Title: Cannabis/CBD for Pain: Clinical Utilities and Risks
Plenary Lecture.
22. 2020 ADDICTION MEDICINE ESSENCIALS CONFERENCE. Virtual. Oct 17, 2020.
Title: Cannabis (THC/CBD) Essentials: Pharmacology, Medical Evidence, and Legal Program Reality.
2-hour Workshop.

23. 18th ANNUAL RETREAT BRAIN TUMOR CENTER OF EXCELLENCE (BTCOE), Winston Salem, NC. September 10, 2021.
Title: Basic and preclinical discovery of ER stress biomarker IRE1a in CIPN.
24. 2021 SYMPOSIUM WAKE FOREST UNIVERSITY GRADUATE SCHOOL ADDICTIONS RESEARCH AND CLINICAL HEALTH (ARCH), Winston Salem, NC. September 11, 2021.
Title: the legal cannabis market in the U.S.A. and its implications to pain patients and minorities.
25. PAIN MECHANISMS LABORATORIES SEMINAR SERIES. Wake Forest School of Medicine, Winston Salem, NC. Oct 4, 2021.
Title: The legal cannabis market in the USA and its implications to pain patients and minorities.
26. 2021 ADDICTION MEDICINE ESSENCIALS CONFERENCE. Virtual. Oct 22, 2021.
Title: Cannabis Essentials: Clinical implications of the current cannabis market in the U.S. and N.C.
1.5-hour Workshop.
27. THE AMERICAN CHRONIC PAIN ASSOCIATION PAIN FREEDOM CONFERENCE. Gaylord Rockies, Convention Center, Aurora, CO. June 25, 2022.
Title: The latest in medical cannabis for pain management.

INTERNATIONAL

1. IV Conferences Santiago Ramon y Cajal, University of San Carlos of Guatemala, Quetzaltenango, Guatemala. 20-23 July, 2005.
Title: Neuropatía inflamatoria: relaciones entre el sistema inmune y el sistema nervioso en el dolor (Inflammatory neuropathy: relation between the immune system and the nervous system in pain).
2. NEUROIMMUNE SIGNALING IN YOUNG AND ADULT PAIN PATHWAYS. 12th World Congress on Pain (IASP), Glasgow, Scotland, UK. Aug 17 -22, 2008.
Title: Cannabinoid receptors differentially modulate microglial function and neuropathic pain behavior.
3. Maastricht University, Department of Anesthesiology. Maastricht, Netherlands, Jun 2, 2009.
Title: The Role of Spinal Glial Cell-Mediated Endocannabinoid Signaling in the Resolution of Postoperative Pain.
4. GLIA IN NEUROPATHY. 8th Dutch Endo-Neuro-Psycho Meeting. Doorwerth, Netherlands, Jun 3-5, 2009
Title: Cannabinoid and Neuronal-Glial Interactions in Acute and Chronic Pain
5. SPINAL ACTIVITY AND PAIN MODULATION, XXIX Annual Meeting and X International Congress of Pain, Queretaro, Mexico, November 11-14, 2009.
Title: Role of selective and non-selective agonists in the modulation of microglial reactivity.
6. BRAINSTEM ACTIVITY, XXIX Annual Meeting and X International Congress of Pain, Queretaro, Mexico, November 11-14, 2009.
Title: Potential analgesic effects of CB2 receptor agonists by actions on spinal microglia following peripheral nerve injury.
7. A MULTIPARTITE SYNAPSE IN UNDERSTANDING PAIN MECHANISMS, Spring Pain Conference, Grand Cayman, B.W.I., April 17-24, 2010.
Title: Perivascular cells and CB receptors.

8. XXX Annual Meeting and XI International Congress of Pain, Mexico D.F., Mexico, November 10-12, 2010.
Title: Role of the endocannabinoid system in the spontaneous resolution of postoperative pain. Lectures for November 10th were cancelled for logistic problems in the convention center.
9. Pre-Congress Conferences: XXIII International Congress of the Medical Association of Huehuetenango (Guatemala), and Medical Association of Comitán, Chiapas (Mexico), Huhuetenango, November 17, 2010.
Title: Management of acute pain.
10. Pre-Congress Conferences: XXIII International Congress of the Medical Association of Huehuetenango (Guatemala), and Medical Association of Comitán, Chiapas (Mexico), Huhuetenango, November 17, 2010.
Title: Physiology of pain.
11. **Plenary lecture:** XXIII International Congress of the Medical Association of Huehuetenango (Guatemala), and Medical Association of Comitán, Chiapas (Mexico), Huhuetenango, November 18 -20, 2010.
Title: Present and Future of Analgesia.
12. LIV National Congress of Physiological Sciences (Mexico), León, Guanajuato, Mexico, Symposium: Chronic Pain: Mechanisms and Perspectives. September 10 - 14, 2011.
Title: Relevance of the cellular phenotype of glia in pain conditions.
13. **Closing Plenary Lecture:** XXXVII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), Monterrey, NL, Mexico. October 28, 2017
Title: Gene therapy using nanotechnology and CD163 for postoperative pain and tissue repair.
14. **Plenary Lecture:** XXXVII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), Monterrey, NL, Mexico. October 28, 2017
Title: CD163 as a potential target for postoperative chronic pain.
15. XXXVII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), Monterrey, NL, Mexico. October 27, 2017
Symposium: Opioids in chronic pain. Title: Role of MKPs in the transition from acute to chronic pain.
16. XXXVII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), Monterrey, NL, Mexico. October 26, 2017
Symposium: Cannabinoids in chronic pain. Title: Are marijuana and cannabinoids synonyms?
17. **Plenary Lecture:** XXXVII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), Monterrey, NL, Mexico. October 26, 2017
Title: Marijuana: medicine, science and pharmacology.
18. 1st International Course for the SouthEastern Region on Pain Medicine and Palliative Care, National Academy of Medicine of Mexico, AMETD-IASP (Mexico), School of Medicine, University Benito Juárez of Oaxaca, Oaxaca, Mexico. August 24, 2018.
Title: THC or CBD?
19. 1st International Course for the SouthEastern Region on Pain Medicine and Palliative Care, National Academy of Medicine of Mexico, AMETD-IASP (Mexico), School of Medicine, University Benito Juárez of Oaxaca, Oaxaca, Mexico. August 24, 2018.

Title: Marijuana or Cannabinoids?

20. XXXVIII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), San Luis Potosi, Mexico. October 25, 2018
Symposium: Cannabinoids in chronic pain. Title: Clinical uses of cannabis in Mexico and other countries.
21. XXXVIII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), San Luis Potosi, Mexico. October 25, 2018
Symposium: Cannabinoids in pain and other symptoms. Title: Cannabis: drug of abuse, medicine or consume product?
22. **Plenary Lecture:** XXXVIII International Congress on Pain and Palliative Care, AMETD-IASP (Mexico), San Luis Potosi, Mexico. October 25, 2018
Title: Pain and Science: past and future.
23. Academic meeting on progress in the treatment of refractory pain, Buenos Aires, Argentina. June 6, 2019. World Institute of Pain (Latin-American section) and Academy of Anesthesiologists and Pain Interventionists of Argentina (ADAID).
Symposium: Treatment for Cancer Refractory Pain. Title: In search for biological markers for early detection of CIPN.
24. Academic meeting on progress in the treatment of refractory pain, Buenos Aires, Argentina. June 7, 2019. World Institute of Pain (Latin-American section) and Academy of Anesthesiologists and Pain Interventionists of Argentina (ADAID).
Symposium: Cannabis and Pain in Refractory Pain Management. Title: Cannabis: medicine or recreational drug?
25. Academic meeting on progress in the treatment of refractory pain, Buenos Aires, Argentina. June 7, 2019. World Institute of Pain (Latin-American section) and Academy of Anesthesiologists and Pain Interventionists of Argentina (ADAID).
Symposium: Cannabis and Pain in Refractory Pain Management. Title: Current status of legal cannabis: Implications in the treatment of pain.
26. Academic meeting on progress in the treatment of refractory pain, Buenos Aires, Argentina. June 7, 2019. World Institute of Pain (Latin-American section) and Academy of Anesthesiologists and Pain Interventionists of Argentina (ADAID).
Symposium: Cannabis and Pain in Refractory Pain Management. Title: Scientific evidence for cannabis and cannabinoids for the treatment of pain.
27. Academic meeting on progress in the treatment of refractory pain, Buenos Aires, Argentina. June 8, 2019. World Institute of Pain (Latin-American section) and Academy of Anesthesiologists and Pain Interventionists of Argentina (ADAID).
Symposium: Debate on Research and Publications in Refractory Pain. Title: Current status of the scientific research in the treatment of pain.
28. Academic Symposium at Centro CIEN, Corrientes, Argentina, June 18, 2019.
Title: Role of macrophage CD163 in persistent postoperative pain and wound healing.
29. Academic Symposium at Centro CIEN, Corrientes, Argentina, June 18, 2019.
Title: Cannabis: The Scientific Evidence

30. 2nd International Course for the SouthEastern Region on Pain Medicine and Palliative Care, National Academy of Medicine of Mexico, AMETD-IASP (Mexico), School of Medicine, University Manuel Velazco Suarez of Chiapas, Tuxtla, Mexico. August 23, 2020.
Title: CBD or THC for pain?
31. 2nd International Course for the SouthEastern Region on Pain Medicine and Palliative Care, National Academy of Medicine of Mexico, AMETD-IASP (Mexico), School of Medicine, University Manuel Velazco Suarez of Chiapas, Tuxtla, Mexico. August 23, 2020.
Title: Natural or synthetic cannabinoids, a reality or fantasy?
32. Center of Integral Pain Management Buenos Aires Foundation (Centro de Atencion Integral del Dolor Buenos Aires Foundation - CAIDBA). Chronic Pain and COVID-19 Pandemic. International Consensus on Telemedicine and Evidence for Revolutionary Interventional Techniques in the Context of COVID-19 Pandemic Conference. Buenos Aires, Argentina. August 12, 2020.
Title: What is the real utility of cannabis for pain management?
33. III Course of Cannabinoids for Medicinal Use for the Treatment of Pain. Scientific, medical, ethical, and productive Considerations. Austral University, Biomedical Sciences. Buenos Aires, Argentina. October 21, 2020.
Title: Legalization of medicinal cannabis in the US: Current situation and what it means to patients.
34. Institute of Investigations in Translational Medicine. Biomedical Sciences, Austral University, Buenos Aires, Argentina – Seminar Series. April 28, 2021.
Title: Cell-directed gene therapy for pain recovery after surgery
35. **Plenary Lecture:** 3rd International Congress for the SouthEastern Region on Pain Medicine and Palliative Care, National Academy of Medicine of Mexico, AMETD-IASP (Mexico), Autonomous University of Campeche, Campeche, Mexico. August 27, 2021.
Title: Endocannabinoids: Advances and Perspectives.
36. IV Course of Cannabinoids for Medicinal Use for the Treatment of Pain. Austral University, Biomedical Sciences. Buenos Aires, Argentina. October 26, 2021.
Title: Legalization of medicinal cannabis in the US: Current situation and what it means to patients.
37. 2nd. International Congress in the Context of the Week of the Chemist, Biologist, and Pharmaceutic. Universidad Autonoma de Tamaulipas, Mexico. December 1, 2021.
Title: A Career in Pain: Exploration, Resilience, Reinvention, and Collaboration.
38. International Academy on the Science and Impact of Cannabis. Doctors Educating on Marijuana. CME Seminar Series. May 17, 2022.
Title: U.S. Cannabis and the Implications for Pain Patients.

DIDACTIC/SYSTEMATIC INSTRUCTION:

CURRENT TEACHING

University of Murcia, Spain.

Lecturer, Somesthesia: mechanoreception, thermoception, and nociception. Experimental and Clinical Neuroscience Master's Program (12 h)

2016 - present

Wake Forest School of Medicine, Medical School
Lecturer, IPP 702 Systems Physiology and Pharmacology – Acetylcholine (2 hrs)
2018 - present

Wake Forest University
Lecturer, NEU 300 Neuroscience – current research topics (2 hrs)
2018 - 2021

Wake Forest School of Medicine, Medical School
Lecturer, IPP 717 Current Topics in Drug Abuse – Cannabis (2 hrs)
2019

PAST TEACHING

- University of Alcalá. Alcalá de Henares, Madrid, Spain, Faculty of Medicine.
Lecturer, Course of Human Physiology, 20 Hours of teaching. 1 hr class (40 – 50 students)
2001/2002.
- Howard Hughes Medical Institute's (HHMI) - Undergraduate Science Education - Rivendell School
District Science program.
Science Instructor. 7 Hours of teaching. 1 hr class (20 – 25 students)
2008
- Dartmouth Medical School, Hanover, NH, USA.
Instructor. Arts and Science Graduate Ethics Survey. 5 Hours of teaching. 1 hr (8 students).
2009 - 2010.
- Dartmouth Medical School, Hanover, NH, USA.
Lecturer. Pharmacology of Alcoholism. Medical Pharmacology. 1 hr class per term (75-80 students)
2009 - 2010.
- Dartmouth Medical School, Lebanon, NH, USA.
Lecturer. Biology of Glia. Program in Experimental and Molecular Medicine (Ph.D. program). 1 hr
class per term (6 – 14 students).
2007 - 2011.
- Dartmouth Medical School, Lebanon, NH, USA.
Lecturer. The Neurobiology of Pain. Rheumatology Program, Fellow's core lecture series. 1 hr class
(6 – 12 residents).
2007 to 2011.
- Dartmouth Medical School, Hanover, NH, USA.
Lecturer. Pharmacology of Obesity. Medical Pharmacology. 1 hr class (75-80 students)
2009 to 2011.
- Dartmouth Medical School, Hanover, NH, USA.
Lecturer. Opioids and Pain Management. Medical Pharmacology. 1 hr class per term (75-80
students)
2011 to 2012.
- Dartmouth Medical School, Lebanon, NH, USA.
Lecturer. Neuroinflammation. Program in Experimental and Molecular Medicine (Ph.D. program). 1
hr class per term (6 – 14 students).
2007 to 2011.
- Dartmouth Medical School, Hanover, NH, USA.
Anes – (8/15/22)

Lecturer. Neuropharmacology: Basic concepts. Neurology Residence Program. Neuroscience Lecture Series for Neurology Residents. 1 hr class per term (4 - 6 residents). 2011 to 2012.

- Dartmouth Medical School, Hanover, NH, USA.
Lecturer. Neuropharmacology: Neurotransmitters and Neuromodulators I. Neurology Residence Program. Neuroscience Lecture Series for Neurology Residents. 1 hr class per term (4 - 6 residents). 2011 to 2012.
- Dartmouth Medical School, Hanover, NH, USA.
Lecturer. Neuropharmacology: Neurotransmitters and Neuromodulators II. Neurology Residence Program. Neuroscience Lecture Series for Neurology Residents. 1 hr class per term (4 - 6 residents). 2011 to 2012.
- Dartmouth Medical School, Hanover, NH, USA. \
Lecturer. Cannabinoids and pain. Pain Medicine Fellowship Program, Fellow's core lecture series. 1 hr class per term (3 students). 2012.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Medication Therapy Management – Special Populations, PHRM 7205.
Co-coordinator and lecturer. 6 hr per term (76 students).
 - Pathophysiology/Pharmacology of Anti-Tuberculosis agents (2 hr) Spring 2013
2012-2013 Spring.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Co-coordinator and lecturer. P3 year. Medication Therapy Management – Special Populations, PHRM 7205.6 hr per term (76 students).
 - Pathophysiology of HIV (1 hr)
 - Pharmacology/SAR of Antiretrovirals (1 hr)
 - Pathophysiology of Glaucoma (1 hr)
 - Pharmacology/SAR of Glaucoma (1 hr)2012-2016 Spring.
- Presbyterian College School of Pharmacy, Clinton, SC, USA. Lecturer.
Lecturer. P1 year. Principles of Pathophysiology, PHRM 5203. 8 hr per term (78 students).
 - Neurological Conditions. (6 hr)2012-2017 Spring.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Coordinator and lecturer. Pharmacy Research Summer Internship Program (PRSI). Scientific Writing. 6 hr per term (7 students).
 - Abstract and Introduction. (2 hr)
 - Methods. (2 hr)
 - Results and Discussion. (2 hr)
 - Journal Club (2)2013-2016 Summer.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Coordinator and lecturer. P3 year. Medication Therapy Management – Nutrition and Gastrointestinal System, PHRM 7103. 7 hr per term (78 students).
 - Pathophysiology/Pharmacology of Obesity (1 hr)
 - Pathophysiology/Pharmacology of Hepatitis, Cirrhosis (2 hr)
 - Pathophysiology/Pharmacology of GERD, PUD (2 hr)

- Pathophysiology/Pharmacology of IBD, CD, Pancreatitis (2 hr)
2013-2017 Fall.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Coordinator and lecturer. P2 year. Medication Therapy Management – Renal System, PHRM 6203.
9 hr per term (78 students).
 - Introduction to Kidney Physiology (1 hr)
 - Pathophysiology of Acute Renal Injury (1 hr)
 - Pathophysiology of Chronic Kidney Disease (1 hr)
 - Pathophysiology of Chronic Kidney Disease (1 hr)
 - Pharmacology of Binders, Vit D, Calcimimetics (1 hr)
 - Pathophysiology of Anemia in CKD (1 hr)
 - Pharmacology of Colony Stimulating Factors (1 hr)
 - Pharmacology of Iron Supplementation (1 hr)
 - Pathophysiology of Sodium, Water, Potassium, Calcium, Phosphate, and Magnesium Homeostasis (1 hr)2013-2014 Fall.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Lecturer. P3 year. Medication Therapy Management – Musculoskeletal, PHRM 7203. 5 hr per term (76 students).
 - Pathophysiology of Acute and Chronic Pain (1 hr)
 - Pharmacology/SAR of Pain (2 hr)
 - Pharmacol/SAR of Rheumatoid Arthritis, Osteoarthritis, Systemic Lupus Erythematosus (2 hr)2013-2016 Spring.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Co-coordinator and lecturer. P3 year. Medication Therapy Management – Case Study, PHRM 7207. 4 hr per term (76 students).
 - HIV Case Study (4 hr)2013-2014 Spring.
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Lecturer. P1 year. Principles of Pathophysiology, PHRM 5203. 8 hr per term (78 students).
 - Neurological Conditions. (6 hr)
 - Pathophysiology of kidney conditions (2 hr)2013-2017 Spring
- Presbyterian College School of Pharmacy, Clinton, SC, USA.
Coordinator and lecturer. P3 year. Medication Therapy Management – Neurosensory, PHRM 7105. 4 hr per term (76 students).
 - Pathophysiology and Pharmacology/SAR of Dementia and AD (1 hr)
 - Pathophysiology of Headache (1 hr)
 - Pharmacology/SAR of Headache (1 hr)
 - Pathophysiology and Pharmacology/SAR of Multiple Sclerosis (1 hr)2014-2017 Fall.

MENTORING RELATIONSHIPS IN RESEARCH SETTING:

Graduate Students

1. June 2008 – August 2008 Nu Cindy Chai (Medical student, Dartmouth School of Medicine).
Project: Comparison of glia in rodent models of pain.

Research Mentor

Accomplishment: Publication PMID: 18538310

Current position: Pain management physician at UCSF Health.

2. Aug 2008 – Jan 2009
Alexander M. Busch (PhD PEMM program student, Dartmouth College)
Project: Role of MKP/ERK pathway in *in vitro* microglial pro-inflammatory phenotype induced by morphine.
Research mentor
Accomplishments:
Current Position: Partner at Putnam Associates, Boston, MA
3. June 2009 – Aug 2009
Ryan B. Schmidt (PhD PEMM program student, Dartmouth College)
Project: Role of MKP/ERK pathway in *in vitro* microglial pro-inflammatory phenotype induced by morphine.
Research mentor
Accomplishments:
Current Position: Addiction Medicine Specialists, Medical Director Recovery Village Cherry Hill, Program Director Addiction Medicine Fellowship, Cooper University Health Care, Camden, NJ
4. Jan 2010 – June 2010
Alex Skorput (PhD PEMM program student, Dartmouth College)
Project: Role of CD11c expressing cells in the induction and resolution of postoperative pain.
Research mentor
Accomplishments:
Current Position: Senior Research Scientist, Geisel School of Medicine and Dartmouth
5. Feb 2011 – April 2011
Beatriz Godinez Chaparro (PhD program student, Neuropharmacology and Experimental Therapeutics, Cinvestav, Mexico)
Project: Role of 5-HT₄, 5-HT₆ and 5-HT₇ serotonergic receptors in microglia and their participation on long-lasting pain.
Research mentor
Accomplishments:
Current Position: Associate of Biological Systems, Autonomous University of Mexico, Xochimilco, Mexico
6. Aug 2012 – Dec 2012
Sladjana Skopelja -Gardner (PhD PEMM program student, Dartmouth College)
Project: Role of MKP-3 in the resolution of postoperative pain: MAPK and MKP levels at spinal cord and paw tissue following paw incision in mice.
Research mentor
Accomplishments: PMID: 24155322
Current Position: Assistant Professor of Medicine, Geisel School of Medicine and Dartmouth
7. June 2013 – Aug 2013
Marian Caesar (PharmD Student, Presbyterian College, internship)
Project: Evaluation of cytotoxicity of nanoparticles using human macrophages.

Research mentor
Accomplishments: PMID : 27615510
Current Position:

8. June 2014 – Aug 2014
Laura Bernal (PhD Neuroscience Program, University of Alcala, Spain)
Project: Cytokine release profile in CD163-overexpressing macrophages.
Research mentor
Accomplishments: PMID : 27615510, 28545809
Current Position: MSL/MSR – Rare Disease, Pfizer, Spain.
9. June 2015 – Aug 2015
Jessica Prestia (PharmD Student, Presbyterian College, internship)
Project: Determination of peripheral diabetic neuropathy and its association with glycemic levels.
Research mentor
Accomplishments: Poster presentation 2015 Sumer Research
Current Position: Pharmacy Manager, Pets First Choice.
10. June 2015 – Aug 2015
Jimmy Pruitt III (PharmD Student, Presbyterian College, internship)
Project: Determination of painful peripheral diabetic neuropathy and its association with treatment and comorbidities.
Research mentor
Accomplishments: PMID: 28435320
Current Position: Clinical Pharmacist Specialist, Medical University of South Carolina, Charleston, SC. CEO of Pharmacy & Acute Care University.
11. Sept 2015 – Dec 2015
Alicia Bort Bueno (PhD Student, University of Acala, Spain).
Project: Cannabinoids on keratinocytes and fibroblasts.
Research mentor
Accomplishments: PMID: 28326930
Current Position: Postdoctoral fellow at Yale School of Medicine.
12. June 2015 – June 2018
Abigail Alvarado Vasquez (MS Student, University of Tamaulipas, Mexico, Research internship).
Project: CD163 in macrophages in inflammatory conditions.
Research mentor
Accomplishments: 29637590, 28983880, 31320508, 31711674, 27615510, 31012376, 30237731, 30588081, 28545809, 28326930
Current Position: PhD student, Medical Biochemistry and Microbiology Doctorate Program at Uppsala University, Sweden.
13. June 2015 – March 2017
David Ferreira (PhD Student, University of Sao Paulo, Riberao Preto, Brazil).
Project: CD163 in macrophages in postoperative pain.
Thesis Co-Advisor
Accomplishments: 28545809, 27615510, 31711674
Current Position: Scientist I, Gene and Cell Therapy at BioAglytix, Durham, NC.
14. July 2016 – March 2017
Brandi Sarpe (PharmD Student, Presbyterian College, internship)

Project: Cannabis and cannabinoids for chronic pain.
Research Mentor
Accomplishments: 29637590
Current Position: Pharmacist at CVS, Gaffney, SC.

15. July 2016 – March 2017

Ashley Kolano (PharmD Student, Presbyterian College, internship)
Project: Cannabis and cannabinoids for chronic pain.
Research Mentor
Accomplishments: 29637590, 28983880
Current Position: Pharmacy Manager at Walmart, Cameron, NC.

16. July 2017 – May 2018

Chuyin Fan (PharmD Student, UNC, internship)
Project: Cannabis potency in dispensaries of the U.S.
Research Mentor
Accomplishments: 32214334
Current Position: Solid Organ Transplant Clinical Pharmacist, UC Davis Health, Sacramento, CA.

17. July 2017 – May 2018

Mary Catherine Cash (PharmD Student, UNC, internship)
Project: Cannabis potency in dispensaries of the U.S.
Research Mentor
Accomplishments: 32214334, 35734402
Current Position: Oncology PharmD, Duke University Hospital, Durham, NC.

18. July 2019 – May 2021

Sarah Pennypacker (MS Student, WFU)
Project: IRE1alpha in pain models and legal cannabis in the U.S.
WFU MS Program in Biomedical Sciences.
Thesis Advisor
Accomplishments: PMIDs: 35366987, 35734402, 35366986, 33080058
Current Position: Medical student at WFU School of Medicine

19. October 2020 – present

Kyle Wallenstrom
VT-WFU School of Biomedical Engineering and Sciences
Project: CD163 for pain recovery after surgery
MS Thesis Advisor
Current Position: Medical student at Rosalind Franklin Chicago School of Medicine

Undergraduate Students

20. June 2008 – May 2012

Mathew Alkaitis (Undergraduate Student, Dartmouth, internship)
Project: glial targeting therapies for Glioblastoma Multiforme.
Research Mentor
Accomplishments: Publications PMID: 20531936; ISBN: 978-953-307-813-7.
Current position: Resident of Internal Medicine at Stanford Medicine and Clinical Medical Lead at Beacon Biosignals. PhD (Oxford), MD, (Harvard Medical School).

21. June 2011 – Dec 2012

Yingna (Snowy) Liu (Undergraduate Student, Dartmouth, internship)

Project: glial targeting therapies for Glioblastoma Multiforme.
Research Mentor
Accomplishments: PMID: 22086978
Current position: Resident of Ophthalmology at UCSF. PhD
(Dartmouth), MD, (Harvard Medical School).

22. January 2012 – May 2012

Daniel Alvarez (Undergraduate Student, Dartmouth, internship,
Trygve E. Myhren 1958 Tuck 1959 Undergraduate Research
Fund)
Project: Immunohistochemistry of the surgery side tissue in mice.
Research Mentor
Current position: Consultant at Boston Consulting Group, Boston,
MA.

23. Jan 2012 – Dec 2012

Brenna Liponis (Undergraduate Student, Dartmouth, internship -
James O. Freedman Presidential Scholar)
Project: MKP-3 in the resolution of postoperative pain.
Research Mentor
Accomplishments: Publications PMIDs: 28405172, 24155322
Current position: Associate Principal, at TRINITY, Munich,
Germany.

24. May 2013 – August 2015

Candler Paige (Undergraduate Student, University of South
Carolina, internship)
Project: CD163 transfection in human cells.
Research Mentor
Accomplishments: PMIDs: 25490519, 28545809, 27615510,
26497478
Current position: Chief Executive Officer at Doloromics, Menlo
Park, CA.

25. January 2014 – February 2014

Dhruvkumar Prakashkumar Patel (Undergraduate Student,
Wofford University, internship)
Project: Culture and stimulation of human macrophages.
Research Mentor
Current position: Obstetrics and Gynecologist, at Medigan Army
Medical Center, Tacoma, WA.

26. July 2013 – May 2014

Bailey Hill Wallace (Undergraduate Student, Presbyterian College,
internship)
Project: Use of nanoparticles to transfect macrophages and
construction of a zebrafish facility.
Research Mentor
Accomplishments: PMIDs: 25490519, 27615510
Current position: Epidemiologist at CDC, Atlanta, GA.

27. February 2015 – May 2015

Cristina Ulecia-Moron (Undergraduate Student, Presbyterian
College and University Pablo de Olavide – Seville, Spain,
internship)
Project: CD163-overexpressing macrophages in wound healing.
Research Mentor
Accomplishments: PMIDs: 27615510, 28545809, 31711674
Current position: Pharmacology and Toxicology doctoral program,
Complutense University of Madrid, Spain.

28. September 2015 – April 2017 Destiny Chandler (Undergraduate Student, Presbyterian College, internship)
Project: Immune response to inflammatory insults.
Research Mentor
Current position: Integrated Life Sciences doctoral program, University of Georgia.
29. September 2015 – April 2017 Rachel Grosick (Undergraduate Student, Presbyterian College, internship)
Project: CD163-overexpressing macrophages in inflammation.
Research Mentor
Accomplishments: PMIDs: 28545809, 31711674, 30237731, 30588081
Current position: Research Associate, Janssen, Philadelphia, PA.
30. Sept 2015 – Dec 2015 Carolina Moracho Vilrriales (Undergraduate Student, University Of Alcala, Spain, internship)
Project: CD163 in macrophages in neuropathies and wounds.
Research Mentor
Accomplishments: PMIDs: 28545809, 30588081, 28435320, 28326930, 31711674
Current Position: Pharmacovigilance System Master File at Kyowa Kirin, Madrid, Spain.
31. November 2018 – May 2020 Katharine Cunnane (Undergraduate Student, WFU, internship)
Project: Wound healing using a 3D human organotypic skin tissue model, CD163 in wound healing, cannabis products in dispensaries.
Research Mentor
Accomplishments: PMIDs: 32214334, 31711674, 33741328
Current position: Medical student at Cornell Medical School
32. August 2019 – May 2021 MaryBeth Dobbins (Undergraduate Student, WFU, internship)
Project: Cannabis products in dispensaries and pain recovery after surgery.
Research Mentor
Accomplishments: doi.org/10.3389/fpubh.2022.893009
Current position: EMS Technician at Durham County EMS
33. October 2020 – May 2022 Mannat Rakkar (Undergraduate Student, WFU, internship)
Project: Cannabis products in dispensaries.
Research Mentor
Accomplishments: doi.org/10.3389/fpubh.2022.893009
Current position: Recently graduated
34. May 2021 – May 2022 Lindsay Amann (Undergraduate Student, WFU, internship)
Project: Cannabis products in dispensaries.
Research Mentor
Current position: Recently graduated
35. August 2021 – present Oriana Gelblung (Austral University, Buenos Aires, Argentina).
Project: ER stress in neuropathic conditions.
Research Mentor
Current position: Research Assistant at my lab.

Residents

36. July 2018 – May 2021
Taylor Brooks (WFU Internal Medicine Residency Program)
Project: IRE1alpha in CIPN.
Research Supervisor
Current position: Hematology Oncology Fellow, Cleveland Clinic

Postdoctoral Fellows

37. Nov 2009 – May 2011
Christian Ndong (Dartmouth School of Medicine)
Postdoctoral Research Fellow
Project: MKPs in glial phenotypes during persistent pain.
Research Supervisor
Accomplishments: Publications PMIDs: 24861519, 22540262
38. Jan 2012 – Mar 2013
Madhurima Saha (Dartmouth School of Medicine)
Postdoctoral Research Fellow
Project: MKPs in the transition from acute to persistent pain.
Research Supervisor
Accomplishments: Publications PMIDs: 24861519, 28405172, 24155322
Current position: Biological Scientist III, Pediatric Neurology at University of Florida
39. November 2018 – present
Miriam Fonseca
Postdoctoral Research Fellow
Project: IRE1alpha in CIPN and nerve injury.
Research Supervisor
Accomplishments: PMIDs: 35366987, 35366986, 33741328, **31320508** (Science paper)

Faculty

40. Sept 2011- March 2012
Simon Hillier, MD (Dartmouth School of Medicine)
Assistant Professor of Anesthesiology
Project: Glia in Anesthetic-Associated Neurotoxicity.
Research advisor
Current position: Chair of Anesthesiology, Dartmouth School of Medicine.