Curriculum Vitae

NAME: Dayalan Sampath

POSITION TITLE: Life Science Research Scientist

INSTITUTION: Stanford University

EDUCATION/ TRAINING:

INSTITUTION AND LOCATION	DEGREE	Completion Date	Department/ FIELD OF STUDY
Tamil Nadu Dr MGR Medical University, Chennai, India	B.P. T	1996-2000	Physical therapy
Madras University (Post Graduate Institute of Medical Sciences), Chennai, India	M.S	2003-2005	Neuroscience
National Institute of Mental Health and Neuroscience, Bangalore, India	Ph.D.	2006-2011	Neurophysiology
Children's Hospital, University of Colorado, Aurora, Colorado, USA	Post-doctoral training	2011-2016	Neurology
Center for Brain and Behavior research, University of South Dakota, USA	Research Instructor	2016-2019	Psychiatry
Neuroscience and Experimental Therapeutics, Texas A&M University, College Station, Texas, USA	Assistant Research Scientist	2019-2025	Neuroscience and Experimental Neurotherapeutics
University of California, San Diego	Associate Project Scientist	2025 -July 2026	Department of Emergency services, and Neurosciences
Stanford University	Scientist	2026-till date	Department of Neurosurgery

A. Personal Statement

- I am a translational neuroscientist specializing in the development of rigorous rodent models of ischemic stroke. My current work focuses on transient middle cerebral artery occlusion (MCAo) paradigms, augmented with hypoxia protocols to more faithfully recapitulate clotting-related pathophysiology observed in the clinical setting. This dual-insult approach enables the study of complex vascular and white matter injury mechanisms that underlie post-stroke disability.
- To interrogate these processes, I employ advanced morphological and functional assessments, including diffusion-weighted imaging and tractography for microstructural analysis, alongside comprehensive behavioral profiling using phenotyper systems, standardized neurological scoring batteries, and assays of sensory-motor and cognitive function. Complementary histological techniques, such as immunohistochemistry, provide cellular-level validation of imaging and behavioral findings.
- Through this integrated pipeline—spanning model generation, multimodal imaging, behavioral phenotyping, and histological validation—I aim to establish reproducible and clinically relevant insights into stroke pathophysiology and recovery. My work contributes to the refinement of

preclinical models and the identification of translational biomarkers that can guide therapeutic development.

- My Previous research determined the role of novel therapeutic agents for treating stroke-induced brain injury in reproductively senescent rats. It was focused on non-coding RNAs, such as microRNA 20a-3p (miR-20a-3p), and their effects on both acute and long-term outcomes. These agents aim to mitigate depressive illness, vascular dementia, and other stroke-related comorbidities. I determined the role of these non-coding RNAs, and histone modifiers in brain injury repair and neurological recovery. The primary goal of my research is to evaluate whether miR-20a-3p can reduce brain injury and associated cognitive and motor impairments by modulating neuroinflammation. Furthermore, I have explored the effects of miR-363-3p on demyelination, building on its known role in reducing acute inflammation and cell loss. Our findings on this topic on miR-20a-3p were recently published in the *Journal of Neurobiology of Aging*, and another manuscript addressing long-term neurodegeneration following stroke is currently under review.
- In addition to my primary research, I have developed fear conditioning studies aimed at identifying innovative therapeutic targets and approaches. This work entailed understanding the health and integrity of brain subregions involved in cognitive pathways and information processing.
- Previously, my research focused on early-life injuries and developing interventions to prevent or reverse long-term neurological consequences. I studied the effects of neonatal hypoxia-ischemia and the therapeutic potential of flupirtine, a potassium channel opener, for treating seizures and improving long-term outcomes. This research resulted in five first authored and five co-authored publications.
- During my postdoctoral training at the University of South Dakota, I established a research facility to evaluate behavioral changes associated with depressive illness and developed a mobile surgical suite for direct drug administration into the brain. This work demonstrated the efficacy of Carbamylated erythropoietin in treating depressive phenotypes in mice.

Positions and Honors

Doctoral Fellow, National Institute of Mental Health and Neurosciences, Bangalore, India
Research Focus: Neural correlates of behavioral alterations in fear learning and memory following early maternal separation in rats
Dates: 2006-2011

Postdoctoral Fellow, Children's Hospital, University of Colorado, Aurora, Colorado, USA
Dates: 2011-2016

Research Instructor, Center for Brain and Behavior Research, University of South Dakota, USA
Dates: 2016-2019

Assistant Research Scientist, Neuroscience and Experimental Therapeutics, Texas A&M University, College Station, Texas, USA
Dates: 2019-2025

Funded and completed Projects

Alzheimer's Association Research Fellowship
Award Number: AARF-21-849749
Dates: 09/2021-08/2025
Project: **"**Novel microRNAs to treat dementia-related memory impairment in a rat model of stroke"
Objective: Evaluate the role of microRNAs, specifically miR-20a-3p, in alleviating vascular dementia-related changes in aged male rats after stroke. This involves developing stroke models, administering micro-RNA therapies, and assessing both acute and long-term. cognitive outcomes.

Honors

- **2005:** Young Investigator Award, The Institute of Neurological Sciences, Chennai
- **2006:** Pre-Doctoral Fellowship, National Institute of Mental Health and Neurosciences (NIMHANS), India
- **2007:** Srinivasan's Award, Association of Physiologists and Pharmacologists of India, Visakhapatnam, India
- **2009:** Junior Research Fellow, Indian Council of Medical Research
- **2010:** International Travel Award, Indian Council of Medical Research, to attend the SfN
- Annual Meeting
- **2011:** Senior Research Fellow, Indian Council of Medical Research
- **2011:** Postdoctoral Fellow, University of Colorado
- **2014:** AES Fellow, American Epilepsy Society

Professional memberships

2001 Life member- Indian Association of Physiotherapist
2007 Life membership, Association of Physiologist and Pharmacologist of India
2007 Life Member- Indian Academy of Neurosciences
2010 Member, Society for Neuroscience
2014 Member, American Epilepsy Society
2018 Society for Neuroscience
2020 American Heart Association
2021 Society for Neuroscience
2022 American Heart association and the society for Neuroscience.
2023 American Heart association and the society for Neuroscience.
2024 American Heart association and the society for Neuroscience.

Professional Service: Peer Review

1. Manuscript Reviewer for:
   - IEEE (2018)
   - BMC Pregnancy and Childbirth (2017-2018)
   - Novel Physiotherapies
   - Annals of Neurology (2014)
   - The Neurobiology of Disease
   - Translational Stroke Research

- Frontiers in Neuroscience
- Frontiers in Pharmacology
- Translational Stroke Research (2022)

2. Grant Proposal Reviewer for:
   - South Dakota-Brain Research Infrastructure Network (SD-BRIN) Faculty Fellowship Program (FOA #GY1819-01)

3. Thesis Review Committee Member at:
   - Basic Biomedical Sciences, University of South Dakota

4. Judge for Poster Sessions at:
   - Center for Brain and Behavior Research (CBBRe) Symposium (August 2018)
   - TAMIN-SFN Symposiums (2019 - 2024)

B. **Publications**

1. White matter injury after brain ischemia. Yujung Park, Kurt Hu, Chunli Liu, Dayalan Sampath, Bingren Hu, Experimental Neurology. Volume 396, February 2026, 115508.

2. Loss of white matter tracts and persistent microglial activation in the chronic phase of ischemic stroke in female rats and the effect of miR-20a-3p treatment.
   Dayalan Sampath, Macy E. Zardeneta, Zara Akbari, Jacob Singer, Balaji Gopalakrishnan, David Austin Hurst, Monserrat Villarreal, Erin A. McDaniel, Brenda Patricia Noarbe, Andre Obenaus, Farida Sohrabji. (2025/2/6; bioRxiv).

3. Sex differences in cognitive impairment after focal ischemia in middle-aged rats and the effect of iv miR-20a-3p treatment. **Dayalan Sampath**, Taylor E Branyan, Kylee G Markowsky, Rithvik Gunda, Nadia Samiya, Andre Obenaus, Farida Sohrabji. Neurobiology of Aging 129, 168-177-DOI-2023

4. Neonatal exposure to a neuroactive steroid alters low-frequency oscillations in the subiculum.
   Brier Fine-Raquet, Francesca M Manzella, Srdjan M Joksimovic, Robert M Dietz, James E Orfila, **Dayalan Sampath**, Vesna Tesic, Navya Atluri, Douglas F Covey, Yogendra H Raol, Vesna Jevtovic-Todorovic, Paco S Herson, Slobodan M Todorovic. PD- 2023/4; Experimental Biology and Medicine. Volume 248, issue 7, pages 578-587. SAGE PUBLICATIONS.

5. Synopsis Theme: Targeting Astrocytes for Poststroke Recovery. **D Sampath**, ME Zardeneta, F Sohrabji; Stroke 54 (12), e503-e504.

6. Sex differences in the long-term consequences of stroke. Courtney E Stewart, Taylor E Branyan, **Dayalan Sampath**, Farida Sohrabji; PD- 2022/3/25. Sex Differences in Brain Function and Dysfunction. Pages 287-308. Springer International Publishing.

7. MiR363-3p treatment attenuates delayed cognitive deficits precipitated by ischemic stroke in middle-aged.
   female rats Panta A, Montgomery K, Nicolas M, Mani KK, **Sampath D**, Sohrabji F. Frontiers in Aging Neuroscience, 2020. DOI: 10.3389/fnagi.2020.586362.

8. Differential effects of the novel neurosteroid hypnotic (3β, 5β, 17β)-3-hydroxyandrostane-17-carbonitrile on electroencephalogram activity in male and female rats. Srdjan M. Joksimovic, **Dayalan Sampath**, Kathiresan Krishnan, Douglas F. Covey, Vesna Jevtovic-Todorovic, Yogendra H. Raol, Slobodan M. Todorovic. British Journal of Anesthesia. 2021

9. Effects of a potassium channel opener on brain injury and neurologic outcomes in an animal model of neonatal hypoxic-ischemic injury. **Dayalan Sampath**, Philip Lam, Maddy Laoprasert, Nicolas Busquet, Andrew White, Marco Gonzalez, Yogendra H Raol. Pediatric Research-Nature (02 January 2020).

10. The role of KCC2 in hyperexcitability of the neonatal brain. YH Raol, SM Joksimovic, **D Sampath**, BA Matter, PM Lam, UB Kompella, Slobodan M Todorovic, Marco I González Neuroscience Letters 738, 135324.

11. Carbamoylated erythropoietin produces antidepressant like effects in male and female mice. **Dayalan Sampath**, Joshua McWhirt, Monica Sathyanesan, Samuel S. Newton. Progress in Neuropsychopharmacology & Biological Psychiatry (available online, 2020 Jan 10).

12. Effects of restraint stress on the regulation of hippocampal glutamate receptor and inflammation genes in female C57BL/6 and BALB/c mice. Joshua McWhirt, Monica Sathyanesan, **Dayalan Sampath**, Samuel S. Newton. Neurobiology of Stress, 2019 April 30.

13. Neonatal ketamine alters high frequency oscillations and synaptic plasticity in the subiculum but does not affect sleep macrostructure in adolescent rats. Francesca M Manzella, Srdjan M Joksimovic, James E Orfila, Brier R Fine, Robert M Dietz, **Dayalan Sampath**, Hanna K Fiedler, Vesna Tesic, Navya Atluri, Yogendra H Raol, Vesna Jevtovic-Todorovic, Paco S Herson, Slobodan M Todorovic. Frontiers in Systems Neuroscience (in press).

14. Anticonvulsant effect of flupirtine in an animal model of neonatal hypoxic-ischemic encephalopathy. **Dayalan Sampath**, Robert Valdez, Andrew M White, Yogendra Raol. Neuropharmacology, 2017 June 3.

15. Cognitive dysfunction in major depression and Alzheimer's disease is associated with hippocampal-prefrontal cortex dysconnectivity. **Dayalan Sampath**, Monica Sathyanesan, Samuel Newton. Neuropsychiatric Disease and Treatment, 2017 June 12; 13:1509-19.

16. EEG power as a biomarker to predict the outcome after cardiac arrest and cardiopulmonary resuscitation induced global ischemia. Lindsay-Rae Weitzel, **Dayalan Sampath**, Kaori Shimizu, Andrew M White, Paco S Herson, Yogendra H Raol. Life Sciences, 2016 Nov 15; 165:21-25.

17. Flupirtine effectively prevents development of acute neonatal seizures in an animal model of global hypoxia. **Dayalan Sampath**, Doron Shmueli, Andrew M. White, Yogendra H. Raol. Neuroscience Letters, 2015 Oct: 607:46-51.

18. Characterization of neonatal seizures in an animal model of hypoxic ischemic encephalopathy. **Dayalan Sampath**, Andrew M White, Yogendra H Raol. Epilepsia. 2014 Jul: 55(7):985-93.

19. A study on fear memory retrieval and REM sleep in maternal separation and isolation stressed rats (is ranked first among the top 20 articles published in the domain of article 25084041, since 2014 (publication date of the domain article, www.WIPIMD.com). **Dayalan Sampath**, K Rajesh Sabitha, Preethi Hegde, Jayakrishnan HR, Bindu M Kutty, Sumantra Chatterjee, Govindan Rangarajan, and TR Laxmi. Behav Brain Res. 2014 Oct 15; 273: 144-54

20. Long term effects of early maternal separation and isolation stress on adulthood behavior of the female rats. **Dayalan Sampath**, S Vaishnavi, R Durgalakshmi, and T Rao Laxmi. Current Science (00113891). 12/25/2010, Vol. 99 Issue 12, p1811-1815. 5p.

C. Editorial review responsibilities and awards

1. BMC Pregnancy and Childbirth recognized for being a reviewer
2. Dove Medical Press confirmed that "Cognitive dysfunction in major depression and Alzheimer's disease is associated with hippocampal prefrontal cortex dysconnectivity", has been well received since it went online and has been viewed 9195 times since published in 2017.
3. WIPIMD selected the article "A study on fear memory retrieval and REM sleep in maternal separation and isolation stressed rats" as the top among 20 articles published since 2014.
4. Best paper award in the year 2007, R. Srinivasan's award for best post graduate presentation during the annual conference of Association of physiologist and pharmacologists of India, held at Vishakhapatnam, India.
5. Young Investigator Award received in 2005, from (NSI) Neuroscience India Organization. Chennai, India
6. National Award Recipient in Scouting received in 1995 from Late President of India Dr. Sankar Dayal Sharma.

D. Fellowships & Research Grants

1. Postdoctoral training grant from Alzheimer's research foundation- AARF- Alzheimer's association's research fellowship (09/2021-08/2025), (TAMU).
2. Advanced magnetic resonance imaging and spectroscopy facility (AMRIS)- imaging grant (2026-2028)- Awarded through the mentor's name (UCSD).

3. Selected for Nano symposium at the SFN Annual meeting 2018 – (received faculty development grant from University of South Dakota to attend the meeting held at San Diego in November 2018)
4. Selected for poster presentation at the ADD (Anti-Epileptic drug discovery) symposium jointly organized by University of Utah and NINDS, awarded travel grant to attend the symposium in May 2015.
5. Selected as an AES (American epilepsy society) fellow, for the year 2014-2015. Invited to present the post-doctoral work at the Annual meeting of AES.
6. Completed project- as a Postdoctoral fellow (November 2011-August 2016) - The Children's hospital, University of Colorado, Denver. (NIH funded project to evaluate the antiepileptic efficacy of the drug flupirtine to control neonatal seizures).
7. Senior research fellowship- Indian Council of Medical Research (45/15/08 Phy BMS). (April 2009-November 2011).
8. NIMHANS Research fellowship (2006-2009).
9. ICMR's International travel grant to attend the Annual meeting 2010, Society for Neurosciences (SFN), San Diego, USA.

E. Grants Submitted in the past.

1. Alzheimer's foundation- AARF grant for postdoctoral training. Awarded (2021-tilldate).
2. Postdoctoral training grant to American Epilepsy Society. The reviewers appreciated the idea and the proposal but was not granted due to lack of funding from the main grant supporting the study.

F. Conference and poster presentations

1. Invited speaker for a symposium conducted at the Tamil Nadu Government physiotherapist Association- conducted in Madurai Medical College, as an online international expert presentation held in September 2025.
2. AAIC 2024 conference. Poster-Cognitive impairment due to ischemic stroke in female rats is associated with secondary neurodegeneration and attenuated with microRNA-20a-3p as assessed by diffusion tensor MR imaging and histological analysis.
3. SfN meetings in the years 2021, 2022, 2023; Presented in nano symposium during an oral presentation in the year 2023.
4. Presented posters in the internation stroke conference during 2022, 2023, 2024.
5. Annual postdoc symposium at the Health Sciences-Texas A&M University- 2019.
6. Oral presentation at the SfN Annual meeting 2018 in a Nano symposium event Carbamoylated erythropoietin produces antidepressant effects in male and female BALB/c mice.
7. Attended Grant Writing Workshop conducted by SD EPCOR at Pierre, SD in July 2018.
8. Carbamoylated erythropoietin produces antidepressant-like effects in male and female BALB/c mice. Presented at the poster session in the Veterans Affairs Health Care System, Sioux Falls, South Dakota in May 2018.
9. Paper presentation “Dulka, B. N., Bourdon, A. K., Clinard, C. T., Muvvala, M. B., Campagna, S. R., & Cooper, M. A. (2017). Metabolomics reveals distinct neurochemical profiles associated with stress resilience. Neurobiology of Stress, 7, 103-112” at the Neuro Journal Club in the University of South Dakota in Jan 2018.
10. Antidepressant effects of carbamylated erythropoietin in a rodent stress model. Presented at the poster session in Center for Brain and Behavior Research (CBBRe) Symposium at the University of South Dakota in Aug 2017.
11. Efficacy of KCNQ channel opener flupirtine for the treatment of neonatal seizures: a preclinical study in a rat model of hypoxic-ischemic encephalopathy. Presented at the poster session in the Rocky Mountain Regional Neuroscience Group at the University of Colorado in May 2015.
12. Efficacy of Flupirtine given after hypoxia-ischemia in controlling neonatal seizures in rats. Presented at the poster session in the ADD (Anti-epileptic drug development symposium) jointly organized by University of Utah, NINDS and CURE at the University of Utah in May 2015.
13. Efficacy of flupirtine to treat hypoxia-ischemia induced neonatal seizures, presented at Gordon Research Conference 2014.
14. Flupirtine is more efficacious than phenobarbital in treatment of hypoxia-ischemia induced neonatal seizures in a rodent model. Presented at the poster session in the AES annual meeting 2014 and was simultaneously presented during the epilepsy investigator workshop, held in Seattle, USA, during December 2014.
15. Efficacy of flupirtine to treat hypoxic-ischemic encephalopathy. Presented at the AES meeting 2013 and was selected for an oral presentation at SIG (significant impact group) talk at Annual meeting 2013- American epilepsy society.
16. Characterization of seizures and effects of flupirtine in an animal model of neonatal hypoxic-ischemic encephalopathy, presented at Neuroscience retreat, organized by The Neuroscience Department, University of Colorado- Estes Park: November 2013.

Rocky mountain regional neuroscience group -2013.

Annual postdoctoral fellows meet at the University of Colorado, 2013.

Pediatric winter symposium, Children's Hospital, University of Colorado, 2013
17. Characterization of neonatal seizures in an animal model of hypoxic-ischemic encephalopathy (presented at The Front range neuroscience group- Fort Collins, CO in November 2012).
18. Characterization of neonatal seizures in an animal model of hypoxic-ischemic Encephalopathy at the Annual meeting 2012- American epilepsy society.
19. Poster presentation on "Impact of early adverse life experiences on fear learning and memory" at the Annual conference of SFN 2009 poster no 468.14 / EE18.
20. Poster presentation on "Impact of early life stress during stress hypo responsive period on the networking activities of the infralimbic cortex, hippocampus and amygdala" at the Annual conference of Indian Academy of Neuroscience in 2008 December.
21. Poster presentation on "Impact of early life stress upon the sleep hygiene of the adult rats" at the Annual conference of SFN 2008 poster no 96.16 / UU8.
22. Poster presentation on "Impact of early life stress on the spontaneous activity of infralimbic cortex and CA1 region of hippocampus during exploratory behavior in male Wistar rats" at Cellular and Molecular Cognitive Neuroscience workshop held at National Center for Biological Sciences Bangalore during February 2008.
23. Paper presentation on "Impact of early life stress on the spontaneous activity of infralimbic cortex and CA1 region of hippocampus during exploratory behavior in male Wistar rats" at the Annual Conference of Association of Physiologist and Pharmacologist of India- Received R. Srinivasan's prize for best PG presentation for the year 2007.
24. Paper presentation on "Effects of vagus nerve stimulation on pentylenetetrazole induced seizures in rats." Part of my MS thesis work- Received T.S. Srinivasan's young Investigator award for the year 2005, organized by Neuroscience India Organization India.

2. Teaching experience

Course Name: Neurobiology
Course title: Basic mechanisms of Epilepsy
Academic Year: 2018-19
Course Director: Prof. Samuel Sathyanesan
Role: Instructor

Course title: Journal club paper on stress resilience
Academic Year: 2017-18
Course Director: Prof. Lee Baugh
Role: Lead

Course Name: IMC603 BHL 2017 Blood, hemo, lymphatic
Course title: Heparin induced thrombocytopenia.
Academic Year: 2017-18
Course Director: Prof. Steve Waller
Role: Facilitator

Course Name: IMC 607 Respiratory block

Course title: COPD
Academic Year: 2017-18
Course Director: Prof. Yi-Fan Li
Role: Facilitator
Course Name: Neuroscience Journal Club

Course Name: IMC602 Nervous Systems
Course title: Medical Student Journal Club
Academic Year: 2018-19
Course Director: Prof. Steve Waller
Role: Facilitator

3. Classroom and research lab teaching

1. Oriented and guiding undergraduate students at the Texas A&M University, Kylee Markowsky and Rithwik Gunda and Ridhi Dilip (MD student) by involving them in research work.
2. Judged 3 posters of grad students during Texas A&M Chapter of the Society for Neuroscience in Interdisciplinary Life Sciences facility, Texas A&M University, Dec 2019
3. Facilitator for a group of 6 MD students during Medical Student Journal Club in Lee Medicine, University of South Dakota, Feb 2019
4. Taught Nicolas Pekas (MD-PhD student) about behavioral assays in rodents, injection and drug administration techniques, and conducting behavioral assays with Ethovision behavior acquisition and analysis software.
5. Facilitated for a group of 6 undergraduate students during Patient Based Learning Activity in Lee Medicine, University of South Dakota, September 2018 (chronic obstructive pulmonary disease)
6. Facilitator for a group of 7 undergraduate students during Patient Based Learning Activity in Lee Medicine, University of South Dakota, April 2018
7. Proctored for Dr. Rezvani' s Molecular biology of a gene class in Spring 2017
8. Taught Neeraj Tiwari (doctoral student) injection techniques, estrous assay and handling in mice and rats
9. Trained Jacob Haiar in injection technique and estrous assay in mice
10. Taught Joshua McWhirt about induction of restrain stress in mice, fur coat, and tail skin imaging and analysis in Image J software. He also got training for handling and injection in mice.
11. Instructed and taught Mr. Robert Valdez (professional research assistant) in the lab about neonatal rat
12. EEG electrode implantation techniques, carotid artery ligation technique, EEG recording, Transcardial perfusion and brain removal.
13. Oriented 7th grade student Mr. Nishal, during his summer volunteering in The Department of Pediatrics, Children's hospital, University of Colorado.
14. Prepared a test module for Pharm. D students at Regis University, in December 2012.
15. Guided postgraduates for their master's dissertations for Ms. Mohana Priya, Ms. Durgalakshmi, Ms. Vaishnavi, Ms. Malini Dhanraj, and Ms. Arpi Dey during their training period in NIMHANS.

16. I taught neuroscience research techniques for 1st year MPhil and PhD Neurophysiology Rotation students.

Contributions to Science

1. **Investigation of miR (20a-3p) in Rescuing Neurovascular Deficits after Stroke**

During my current postdoctoral training, I am evaluating the role of non-coding RNA miR (20a-3p) in rescuing neurovascular deficits in reproductively senescent female rats after stroke. Our findings show a significant reduction in white matter tracts, motor activity , cognition and affect.

2. Evaluation of Tropic Factors in Treating Depression-like Phenotypes

In my previous postdoctoral position, we aimed to evaluate the therapeutic efficacy of novel drugs to treat depressive illnesses. We focused on multifunctional trophic factors, such as erythropoietin (EPO), carbamoylated erythropoietin during the funding period. Our findings show that engineered erythropoietin (carbamoylated erythropoietin) reverses depression-like symptoms in male and female BALB/c mice, with gender-specific and stage-of-estrous effects.

3. Development of a Neonatal Seizures and Epilepsy Model

During my first postdoctoral training, we developed a neonatal hypoxia-ischemia model of seizures and epilepsy. We characterized neonatal seizures with behavioral and electrophysiological correlations, enhancing the translational validity of the model. We tested the efficacy of a novel anticonvulsant, flupirtine, and characterized epileptogenic changes in EEG and sleep architecture.

4. Development of a Post-Traumatic Stress Disorder and Schizophrenia Model

During my doctoral training, I explored the pathological underpinnings of psychiatric disorders like post-traumatic stress disorder and schizophrenia. We established an early life stress model in rats (early deprivation model), revealing changes in cage behaviors, fear extinction, and neuronal synchrony between hippocampus, amygdala, and prefrontal cortex and sleep architecture.

5. Evaluation of EEG Power after Cardiac Arrest and Resuscitation

We evaluated local field potentials in C56 mice after cardiac arrest and resuscitation, observing that mice with low delta and total power had a low propensity to survive.

6. Neurosteroid Anesthetics and EEG Activity

We evaluated novel neurosteroid anesthetic agents for sedating neonatal rats, observing a profound burst suppression pattern of EEG with female rats compared to male rats.

Complete List of Published Work in My Bibliography:
https://scholar.google.com/citations?user=F6S0JYoAAAAJ&hl=en

Techniques Employed in Research Projects

1. Doctoral Study: Mechanisms of Post-Traumatic Stress Disorder

- Behavior assays: fear conditioning, extinction, T-maze, and cognitive tests
- Local field potential electrophysiology
- Cell morphology with bright field microscopy
- In vivo unit activity in rat models
- Stereotactic implantation of electrodes
- Analysis of local field potential signals using Spike and other software

2. Postdoctoral Fellowship at the University of Colorado, Denver

- Fabricated neonatal hypoxia chamber for EEG recording
- Performed carotid artery ligation surgeries
- Developed hypoxic ischemic encephalopathy injury in neonatal rats
- Recorded EEG during hypoxia and seizure detection
- Conducted behavior assays for cognition, affect, and sensory motor integrity
- Performed T1 and T2 weighted MRI, and EEG polysomnography.

3. Research Instructor Position at the University of South Dakota

- Developed behavior assays and automated analysis facility for mouse models of depression
- Characterized depressive phenotype and evaluated cognition
- Proficient in Noldus-Ethovision package
- Conducted drug administration, behavior assays, and stereotactic drug injections

4. Assistant Scientist position at the Texas A&M University- evaluation of novel micro RNAs to treat stroke related ischemic injury in rat models.

1. Evaluation of sex differences in stroke related injury and its impact of treatment with novel micro RNAs.
2. Development of middle cerebral artery occlusion induced stroke injury.
3. Conducting tests of sensory motor deficit to evaluate stroke related injury.
4. Evaluation of cognitive deficit with assays remote fear memory retrieval, tests of episodic memory with novel object recognition, evaluation of social cognition, and contextual learning with Barnes maze test, evaluation of affect with measures of fear extinction.
5. Morphology with t2 MRI for evaluation of hyperintense lesion at chronic time points.

6. Analysis of diffusion tensor imaging related MR measures of axial diffusivity, mean diffusivity, radial diffusivity, fractional anisotropy, and estimation of volumes.
7. Tractography with DSI software package.
8. Basic morphology for cell density quantification (CV stain), evaluation of white matter density with Weil myelin staining, lectin staining for the evaluation of microvasculature in the brain. Basic Immuno histochemistry staining procedures for neurons, astrocytes, and microglia.
9. Bright field microscopy and confocal microscopy. Data analysis and quantification with image J, Fiji, and Q path software packages.
10. Statistical analysis with Graph pad -Prism.
11. Basic ELISA assays, and high-resolution multiplex assays for evaluation of cytokines with very low serum volumes.
12. Stereotactic rAAV and administration of other drugs in the brain.
13. Intravenous administration of micro RNAs with lipid vesicles in rats.
14. Blood draw and its processing.
15. Transardial perfusion fixation and brain extraction, brain micro dissection for various sub regions in the brain.

5. **Associate Scientist at University of California, San Diego**. Evaluation of stroke therapies to treat grey and white matter injury.
    - **01.** Middle cerebral artery occlusion model in mice and rats and its variation including hypoxia.
    - **02.** Spontaneous behavior validation with phenotyper, for evaluation of sensory motor deficits and cognition.
    - **03.** Morphological validation of white matter injury with Advanced diffusion tensor imaging and tractography.
    - **04.** Evaluation of stroke pathology with anterograde and retrograde tracers.