



Vishnu Suppiramaniam, D.V.M., M.S., Ph.D.
Director of Research Development & Support
Co-director, Center for Neuroscience Initiative
Gilliland Endowed Professor
Department of Drug Discovery & Development
Harrison School of Pharmacy
Auburn University, Auburn, Alabama 36849

Citizenship: U.S.
Marital Status: Married
Spouse - Bawani Vishnu, D.M.D.
Major, US Air Force (ALANG - Retired)

Address: 720 S. Donohue Drive
Auburn University

Telephone (334) 244-5001 (home) (334) 844-8296 (work)
(334) 430-5397 (mobile)

E-mail: suppivd@auburn.edu

Educational Background

Tuskegee University, Alabama, D.V.M. (Clinical Residency)2000
Auburn University, Auburn, Alabama, Ph.D. (Biomedical Sciences)1993
Auburn University, Auburn, Alabama, M.S. (Pharmaceutical Sciences)1989
Madras Veterinary College, Chennai, B.V.Sc.....1985

ADMINISTRATIVE RECORD

Key University Administrative Roles

Director of Research Support2020-present

Responsibilities include fostering opportunities for all faculty members in the school to participate in funded research activities and help ensure that every faculty member in the

school has the skills, knowledge, tools, and support needed to become a funded researcher. Instrumental in creating a culture of research excellence by identifying interdisciplinary research opportunities to support both basic and applied research. Played a major role in mentoring faculty researchers and developing mentoring skills in others by conducting and coordinating relevant training. Assisting the Associate Dean for Research in building strong public and private research collaborations and disseminating information about the research mission to internal and external stakeholders.

Responsible for organizing the first Neuroscience Research symposium and Retreat at Auburn University. World renowned neuroscientists from US, Canada, and program officials from NIH delivered lectures. More than 250 participants from 16 different institutions from US, Canada, and Europe attend the symposium.

Initiated the Faculty Research Enhancement Exercise (FREE) at the Harrison School of Pharmacy. **Conducted interactive seminars on:**

- Crafting successful NIH small grant applications
- Preparing winning NIH- AREA and REAP grant applications
- Navigating the NIH reporter and NIH match maker
- Crafting successful specific aims section for NIH grant proposal
- Preparing a proper NIH-biographical Sketch

Initiated research collaborations with Alabama State University (HBCU) to provide research training in neuroscience for underrepresented minority undergraduate students. This collaboration included 16 faculty members from five different colleges/schools from Auburn University and Alabama State University and resulted in a high-impact score for an NIH-R25 grant proposal for \$1.9M. Funding expected in March 2022.

Coordinated the pre-review of NIH Grant proposals (R01, K99/R00 & K08) by former and current NIH study section members - 60% of these grant proposals were funded.

Conducted one-to-one meetings with various colleges and helped develop NIH- grant proposals.

Promoted research collaboration between faculty from pharmacy practice and drug discovery and development departments.

In collaboration with the Center for Clinical and Translational Research (CCTR) at UAB, conducted a Mock NIH Study Section.

Conducted work in Progress (WIP) meetings and provided critiques on potential NIH-R01, K99 and K01 grant proposals.

Participated as a course coordinator for grant writing course and introduced new ideas in crafting competitive NIH-fellowship grant (F31) proposals.

Helped initiate the 4+2 BS - PharmD dual degree program between Tuskegee University and Harrison School of Pharmacy.

Launched an interdepartmental research collaboration with Chemical Engineering and the Department of Drug Discovery and Development - two junior investigators will submit an NIH-MIRA award in fall 2022.

Acting Associate Dean for Research and Graduate Programs.....2018-2019

Assistant Dean for Research and Graduate Programs, School of Pharmacy.....2016-2018

Responsible for leading the school's research program, infrastructure, and graduate student training programs. Promote the engagement of School of Pharmacy faculty in all research endeavors within the school, across campus and external to this university. Responsible for administering all aspects of the graduate degree (M.S. and Ph.D.) programs. Helped frame and accomplish the aggressive vision of School of Pharmacy to grow scholarly programs and extramural research funding. Participated as a member of the senior administrative team, facilitating and inspiring research across the School of Pharmacy, graduate student and faculty development in grant writing, building and managing core research infrastructure, representing the school to internal and external constituencies interested in research, and positioning the school to capitalize on innovative funding opportunities. Serves as a member of the Associate Deans for Research Council and Auburn University Research Administrative Coordination Team. Serves as the Chair for the School's Graduate Program Committee and Pharm.D. - Ph.D. Dual Degree Committee.

Selected Accomplishments

- During my tenure as department head and assistant dean, the federal research funding the School of Pharmacy increased from \$780,000 to \$3,200,000.
- Assisted the Dean with a \$23 million Pharmaceutical Research Building Project. Interviewed and selected architects involved in the planning of specialized laboratory spaces, research infrastructure facilities, classrooms, conference rooms and vivarium.
- Increased the number of international graduate students supported by fellowships from their home governments by about 100%.
- Organized a visit of NIH senior research administrators to Auburn University in 2018 to conduct workshops on developing successful grant applications.
- Initiated the development of a Center for Neuroscience (CNS) at Auburn University bringing together more than 30 neuroscience researchers from Auburn, the University of Birmingham at Alabama, Emory University and University of Magdeburg, Germany.
- The "Center for Neuroscience Initiative" has resulted in over \$5 million in federal grant funding and over 30 collaborative publications in the first 36 months of its inception.
- Organized a successful Center for Neuroscience Initiative Symposium and Retreat (2020) by bringing in many world-renowned neuroscientists to Auburn University. There were 241 participants and 69 poster presentations.
- Established relationships with NIH program directors that have resulted in increased grant funding for Harrison School of Pharmacy. Recently funded National Institutes

on Drug Abuse (NIDA) grant was awarded for 5 years without any cuts in the requested budget.

- Established collaborations with 8 universities in the Peoples Republic of China and implemented the 3+2 B.S., M.S. dual degree program at the Harrison School of Pharmacy.
- Developed collaborations with research investigators from various colleges and schools at Auburn University to initiate submission of NIH Fellowship grants.
- Established an Oversees-Talent Workstation between Jiangsu Province Pharmacological Society in China with over 900 researchers and the Harrison School of Pharmacy in 2017.
- Coordinated a workshop seminar on “Food, Nutrition and Human Health” in 2017 at China Agricultural University, Beijing to initiate research collaborations.
- Helped organize a Nanobiotechnology Conference in 2016 at Auburn University to enhance research collaborations with universities in the Southeastern states including Historically Black Colleges & Universities.

Head (interim) of the Department of Drug Discovery and Development.....2012-2016

Responsible for providing the leadership and vision for the department. As the chief administrator of the department, serving as a fiscal overseer - finding creative ways to extend the departmental budget including successful efforts at generating external fundraising. Supervising faculty, staff and visiting scholars of the department. Serving as an intermediary between the dean and the faculty members, I was responsible for advocacy and education of administrators at various levels about departmental quality and accomplishments. Serve as an external liaison bridging, building and maintaining relationships with alumni and external stakeholders. Helping to lead the faculty in curriculum development and program design. Responsible for recruitment and retention of faculty and staff members. Served as a counselor, coach and mediator for faculty and staff members. Serve as a member in the dean’s executive council and the school’s strategic planning committee. As department head, I was responsible for management of 17 faculty members, 6 staff members, and 40-50 graduate students.

Selected Accomplishments

- As department head, assisted the incorporation of basic science components into the “Practice Ready Curriculum” of the Harrison School of Pharmacy.”
- Constituted and implemented a Junior Faculty Mentoring Plan.
- Constituted a departmental Document Review Committee for review of grants, manuscripts, and other documents.
- Organized visits of several NIH study section members with expertise in neuroscience, cancer, diabetes, and cardiovascular diseases. These experts were then paired with our faculty members to serve as research collaborators or consultants.
- Established research and training collaborations with minority institutions including Alabama State University that resulted in joint training grant submissions to NIH and

NSF in 2014. In addition, faculty and graduate student training grants were initiated in collaboration with Tuskegee University.

- As per the strategic plan of the university, affiliate and adjunct faculty appointments were increased in the department to enhance collaborative teaching and research opportunities.
- Served as the Chair of the Faculty Search Committee, identified and recruited female/minority applicants with federal funding.
- Served as Chair of the Promotion and Tenure Committee for 7 faculty members in the Department of Drug Discovery & Development.
- Established industry collaborations with pharmaceutical companies, including KalGene Pharmaceuticals, Ontario, Canada.
- Led the Neurodegenerative Cluster Hire Initiative with the vision of establishing a Center for Neuroscience at Auburn University.
- Strengthened the research collaborations with the Rett Syndrome Foundation and the University of Alabama at Birmingham.
- Initiated an External Research Advisory Board to assist departmental faculty in grant development and submission.
- Organized a retreat for the Department of Drug Discovery & Development for strategic planning including identification of specific goals and objectives for the department that align with strategic initiatives of the School of Pharmacy and Auburn University.

Administration (Non-academic Organizations)

In addition to my academic responsibilities, I have held a variety of positions in private corporations. These experiences have provided me additional managerial and leadership skills that have strengthened my ability to develop and implement strategic plans, specific goals and objectives as well as financial planning.

Secretary, Vishnu Dental, P.C.2008-2020
Responsible for financial management of this Professional Corporation.

Member of the Board of Directors, Tamil Academy for Advancement of Science2005-Present
This is a non-profit organization based in British Columbia, Canada. Responsible for establishing scientific collaborations, organizing annual meetings at the world-renowned “Sick Children’s Hospital” in Toronto, Canada.

PROFESSIONAL EXPERIENCE

Director of Research Development and Support
Harrison School of Pharmacy, Auburn University.....2020-Present

Acting Associate Dean for Research & Graduate Programs Harrison School of Pharmacy, Auburn University	2018-2019
Co-director, Center for Neuroscience Initiative Auburn University	2018-Present
Assistant Dean for Research & Graduate Programs Harrison School of Pharmacy, Auburn University	2016-2018
Visiting Professor, Ocean University China, PRC	2017-Present
Head (interim), Department of Drug Discovery & Development Harrison School of Pharmacy, Auburn University	2012-2016
Professor, Department of Drug Discovery & Development Harrison School of Pharmacy, Auburn University	2015-Present
Associate Professor, Department of Drug Discovery & Development Harrison School of Pharmacy, Auburn University.....	2004-2015
Chair, Division of Pharmacology & Toxicology, Harrison School of Pharmacy, Auburn University	2006-2008
Assistant Professor, Department of Pharmacal Sciences Harrison School of Pharmacy, Auburn University.....	2001-2004
Associate Professor, Department of Biology, Tuskegee University, Tuskegee, Alabama	1998-2000
Director, Neuroscience Laboratories, Tuskegee University.....	1995-2000
Assistant Professor, Department of Biology, Tuskegee University	1993-1998
Research Fellow, Department of Physiology, Kilpauk Medical College, Chennai, India	1986-1987
House Surgeon, Madras Veterinary College, Chennai, India.....	1985-1986

A. Honors & Awards

Fellowships

Gilliland Endowed Professor – Harrison School of Pharmacy	2021
Jack Clift Fellow in Research – Harrison School of Pharmacy	2020
American Association of Schools of Pharmacy (AACP) – Academic Research Fellows Program (ARFP)	2015-2016

American Association of Schools of Pharmacy (AACP) – Academic Leadership Fellows Program (ALFP).....	2006-2007
National Institutes for Neurological Disorders and Stroke - Research Career development Award	1997-2001
National Science Foundation Fellowship, “Teaching Neuroscience for Undergraduates” Cornell University, Ithaca, New York	1997
Summer Research Fellowship, Marine Biological Laboratory Woods Hole, Massachusetts	1998
Summer Research Fellowship, Marine Biological Laboratory Woods Hole, Massachusetts	1995
Kellogg Fellow, Tuskegee University	1993-199

Honors

Section Chair, Technological Advances in Science, Medicine & Engineering Conference, Toronto, Ontario, Canada	2021
American Association of Colleges of Pharmacy (AACP) – Fall Leadership Institute	2019
Invited press conference on “Prenatal Cannabinoid Exposure and Cognitive Impairment in Offspring” Society for Neuroscience.....	2018
Faculty Mentor of the Year Award, Auburn University Student Government Association	2017
Outstanding Teacher of the Year Award, Harrison School of Pharmacy	2017
Excellence in Neuroscience – Awarded by Technological Advances in Science, Medicine & Engineering, Sick Children’s Hospital, Toronto, Canada.....	2016
NIH-SBIR Study section membership	2016-Present
Grant Reviewer, Medical Research Council (MRC), UK	2015-Present
Grant Reviewer, Alzheimer’s Association, UK	2014-Present
Grant Reviewer, Organization for Scientific Research, Netherlands	2013-Present
NIH Study section membership ZRG1-F03A	2012-Present

Invited grant Reviewer, Department of Defense, Traumatic Brain Injury section.....	2011
Section Chair, Technological Advances in Science, Medicine & Engineering Conference, Toronto, Ontario, Canada	2010
Invited grant reviewer, NIH Challenge Grant	2009
Section Chair, Technological Advances in Science, Medicine & Engineering, Conference, Toronto, Ontario, Canada	2009
Article entitled “Amyloid beta peptides and glutamatergic synaptic dysregulation” was as Editor’s Pick as newsworthy article in Experimental Neurology	2008
Section Chair, Technological Advances in Science, Medicine & Engineering Conference, Toronto, Ontario, Canada	2008
Invited grant reviewer – NIEHS/NIH.....	2007
Biogrant Award, Office of the Vice President for Research, Auburn University	2007
Section Chair, Technological Advances in Science, Medicine & Engineering Conference, Guelph, Ontario, Canada	2007
Innovative Research Award in Neuroscience Technological Advances in Science, Medicine & Engineering Conference Guelph, Ontario, Canada	2006
Article entitled “Neural cell adhesion molecule-associated polysialic acid inhibits NR2B-containing N-methyl-D- aspartate receptors and prevents glutamate-induced cell death in Journal of Biological Chemistry was an Editors pick as newsworthy article, commentary in Nature Glycomics.....	2006
Invited press conference on “A potential new therapy for cognitive deficits in Prenatal alcohol exposure” Society for Neuroscience, Atlanta, Georgia.....	2006
Invited lecturer & workshop organizer for the International Brain Research Organization (IBRO), February 2005, Colombo, Sri Lanka	2005
Invited press conference on “Prenatal nicotine exposure and cognitive impairment in offspring” Society for Neuroscience, Washington, DC	2005
Invited press conference on “Prenatal alcohol exposure and cognitive deficits in offspring” Society for Neuroscience, Washington, DC	2005

Section Chair, “Technological Advances in Science, Medicine & Engineering Conference, Ontario, Canada.....	2004
Invited grant reviewer for NIH/NIGMS.....	2004
Invited resource personnel for the “International Society for Neurochemistry” Sri Lanka.....	2004
Appointed Chair for the “Technological Advances in Science, Medicine and Engineering Conference”, Ontario, Canada.....	2004
“Late Breaking” abstract entitled “Glutamate receptor dysfunction in the brain of streptozotocin-diabetic rodents” was selected by the American Diabetic Association to be presented in a special session (50 most innovative projects were chosen out of 2800 abstracts)	2003
Appointed Section Chair of the "Technological Advances in Science, Medicine & Engineering Conference, Ontario, Canada	2002
Invited to host a half an hour program on "Asian Television Network" on Early Neuropathogenesis of Alzheimer's disease, Ontario, Canada.....	2002
Received a "Biogrant Award" from the Office of the Vice President for Research, Auburn University.....	2002
Invited guest at the Annual Meeting of the Indian Institute of Science, Bangalore, India.....	2002
Appointed as an executive member of the organization committee for the "Technological Advances in Science, Medicine & Engineering Conference, Ontario, Canada.....	2001
Outstanding Faculty Performance Award for Research, Tuskegee University.....	2001
Invited to co-chair the Bioscience & Technology Conference Ontario, Canada	2000
Invited speaker at the International Society for Neurochemistry Chicago, Illinois.....	1999
National Institutes for Health Research Award for the "Bridges to the Doctoral Degree Program", Tuskegee University	1998
Appointed member of the executive committee for the Bioscience & Technology Conference Ontario, Canada.....	1999
National Science Foundation Research Award for the	

Enhanced Discovery and Learning in Biotechnology Program,
Tuskegee University1998

Appointed co-chair of the North American Biomedical Conference,
Ontario, Canada1998

Summer Research Fellowship in Neurobiology at the Marine
Biological Laboratory, Woods Hole, Massachusetts.....1998

Career Development Award from the National Institutes for
Neurological Disorders and Stroke1997

Appointed as the executive officer of the North American
Biomedical Conference, Ontario, Canada1997

National Science Foundation Scholarship for the workshop on
"Teaching Neuroscience for Undergraduates," Cornell University1997

Research Award from the National Institutes for General Medical
Sciences1995

Summer Research Fellowship for Neurochemistry at the Marine
Biological Laboratory, Woods Hole, Massachusetts.....1995

Outstanding faculty performance award, Tuskegee University1995

Award for Academic Excellence, School of Veterinary
Medicine, Auburn University1993

Award for Academic Excellence, School of Veterinary
Medicine, Auburn University1992

Student awards under my supervision as major professor:

Year	Name	Award
2021	Miles Wiley	NIH-G-Rise T32 Scholar, GEM Scholarship NIH – Minority Supplemental Award
2020	Priyanka Pinky	Pharmaceutical Research & Manufactures of America (PhRMA) Foundation - \$50,000
2020	Priyanka Pinky	Best poster presentation (3 rd place) - VCOM Research Day (Among 75 posters)
2020	Warren Smith	American Foundation for Pharmaceutical Sciences (AFPE) Fellowship - \$10,000
2019	Warren Smith	Second place in poster presentation. Graduate Research symposium
2019	Jenna Bloemer	First Year Experience Mentor Award – Auburn University Graduate School

2019	Jenna Bloemer	American Foundation for Pharmacy Education Fellowship (AFPE) - \$ 10K
2019	Priyanka Pinky	Media Coverage - Experimental Biology (Among 2000 abstracts)
2019	Priyanka Pinky	ASPET – Young Scientist Award
2019	Priyanka Pinky	Top 16 abstracts - American Association of Clinical Pharmacology (among 200+ abstracts)
2019	Priyanka Pinky	3 Minute Thesis (MT) Presentation Finalist – Auburn University (among 100+ students)
2019	Priyanka Pinky	PhRMA Foundation pre-doctoral fellowship (2years - \$50K)
2019	Priyanka Pinky	Best poster presentation (2 nd place) - VCOM Research Day (Among 75 posters)
2019	Priyanka Pinky	Invited press conference in ‘Society for Neuroscience’ (Among 13000 abstracts)
2019	Priyanka Pinky	Alzheimer’s Disease Drug Discovery Foundation Award (among 200+ participants)
2019	Manoj Govindarajulu	Alzheimer’s Disease Drug Discovery Foundation Award (among 200+ participants)
2018	Jenna Bloemer	Outstanding Graduate Student Award (top 10 selected from Auburn University)
2018	Jenna Bloemer	Auburn University Research Symposium 2 nd place oral presentation
2018	Jenna Bloemer	American Federation for Pharmaceutical Education Pre-doctoral Fellowship in Pharmaceutical Sciences
2018	Manoj Govindarajulu	First place- Poster Presentation, Research Student Symposium, Auburn University
2018	Manoj Govindarajulu	Alzheimer’s Drug Discovery Foundation Young Investigator Scholarship Award, 12 th Annual Drug Discovery for Neurodegeneration Conference, Washington DC
2017	Manoj Govindarajulu	Graduate Travel Award
2017	Jenna Bloemer	American Association of College of Pharmacy Walmart Scholarship
2016	Jenna Bloemer	Award of Excellence in Clinical Communication (chosen from 150 students)
2015	Subhrajit Bhattacharya	CMB-NSF Summer Fellowship Graduate school thesis/dissertation award

2015	Jenna Bloemer	School of Pharmacy Research Symposium People's Choice Award
2014	Subhrajit Bhattacharya	3MT (three minutes competition) selected among top 10
2014	Subhrajit Bhattacharya	Graduate school thesis/dissertation award
2014	Jenna Bloemer	Merck Award of Excellence (top 2% of class in terms of academic performance)
2014	Jenna Bloemer	Rho Chi Honor Society
2014	Jenna Bloemer	Pharmacy MTM Competition 1 st place overall
2014	Jenna Bloemer	Merck Award of Excellence (top 2% of class in terms of academic performance)
2014	Jenna Bloemer	Harrison School of Pharmacy Dean's Scholarship
2013	Dwip Bhattacharya	Tillery Award – Auburn University
2013	Jenna Bloemer	HSOP Golf Tournament Scholarship
2012	Manal Buabeid	Outstanding graduate student of Harrison School of Pharmacy 2012 American Foundation Pharmaceutical Education pre-doctoral fellowship
2011	Engy Ali	Outstanding graduate student of School of Pharmacy
2009	KarikaranThiruchelvam	Invited to Chair the “receptor and ion channel” section in the annual meeting of the Society for Toxicology, Baltimore, Maryland, March 2009 Received a travel award to present a talk on “prenatal nicotine exposure and the mechanism of memory loss” at the international Neurotoxicology Association, Jerusalem, Israel, July 2009
2009	S. Shanmugam	Elected to Who's Who Among Students in American Universities and Colleges
2009	Brian Shonesy	Outstanding graduate student of Harrison School of Pharmacy
2008	S. Uthayathas	Selected as one of top 10 graduate students at Auburn University. March
2008	S. Shanmugam	Selected as an outstanding graduate student of Harrison School of Pharmacy
2008	S. Uthayathas	Elected to Who's Who Among Students in American Universities and Colleges.

2007	K. Parameshwaran	Selected as one of top 10 graduate students at Auburn University, March 2007 Won 2nd place in poster presentation at the Graduate Student Forum, Auburn University, March 2007
2006	Nayana Wijayawardan	Won 1st place in oral presentation at the Graduate Student Forum, Auburn University, March 2007
2006	Nayana Wijayawadhane	First place in oral presentation & 3rd place in poster presentation in Auburn University graduate student forum, March 2007
2005	Catrina Sims	First place in oral presentation & 3rd place in poster presentation in Auburn University graduate student forum, March 2007
2005	Thiru Vaithianathan	Was selected as one of top 10 graduate students at Auburn University, March 2005
2004	K. Parameshwaran	Received an Invitation from the editor of the Neurobiology of Lipids journal to submit a research article based on his presentation at the International Alzheimer's Disease Symposium, July 19, 2004
2004	Thiru Vaithianathan	Third place in Auburn University graduate student forum, March 2004
2003	Catrina Sims	Received Cell & Molecular Biology Summer Research Fellowship, May 2004
2003	Thiru Vaithianathan	Third place in Auburn university graduate student forum, March 2003
2002	Thiru Subramaniam	Elected to join the National science honor society "Beta Kappa Chi" as a member of Tuskegee University
2001	Thiru Subramaniam	Best presentation award at the annual symposium of the School of Veterinary Medicine, Tuskegee University, March 15, 2001
2000	Thiru Subramaniam	Awarded the certification of achievement for obtaining highest grade point average in the class, April 25, 2000 Awarded certification of achievement for outstanding work in Neuroscience Graduate student
1998	Solomon Yilma	First place for Sigma -Xi poster presentation, Tuskegee University, March 1996

1997	Solomon Yilma	Summer research fellowship to Vanderbilt University School of Medicine, June 1997 Third place for Sigma-Xi oral presentation, Tuskegee University, March 1996
1996	Xenoria Causey	Second place for Sigma-Xi poster presentation, Tuskegee University, March 1996
1996	Lauren McCall	Second place for Sigma-Xi oral presentation, Tuskegee University, March 1996
1996	Solomon Yilma	Summer research fellowship to University of Washington, June, 1996
1995	Solomon Yilma	First place for oral presentation, Tuskegee University, March 1996 Won the summer research fellowship to Children's Hospital at Harvard University Medical School, June, 1995
1994	David Ware	Summer research scholarship to Michigan State University, June - August 1994

B. Teaching

Teaching Philosophy:

The definition of an ideal teacher, in my opinion, is the one who is respected by students and can break down complex information into simple facts that can be readily understood. Teaching extends beyond the academic realm into every aspect of our daily lives. To me, teaching is conveying accurate, up-to-date information that can foster creativity, curiosity and critical thinking.

Typically, in using Socratic teaching methods, students are encouraged to struggle for conceptual understanding without depending on the instructor to provide ready-made answers to each question that arises in a discussion. Despite being one of the most effective ways of teaching, these techniques are known to have the potential to cause some level of anxiety and frustration for the students. Being aware of these potential barriers, I have given a lot of thought to designing a Description, Simulation, and Application (DSA) approach to teaching undergraduate and graduate courses. I use one of the powerful strategies known as problem (or concept) "dissection" of the issue at hand using multiple representations. This is an essential aspect of teaching and learning because of our students' wide range of learning styles. The idea is to "dissect" a given situation into verbal, pictorial, graphical, and symbolic representations. In my own experience in teaching pharmacology, I have discovered that some representations are much more effective than others. I also employ interactive and active learning strategies to engage the students in the classroom. I often remind the students that retrieval (rather than mere repetition), self-testing and "precise elaboration" can enhance the recall of information that can be effectively applied to solve problems.

The DSA approach uses computer simulations as the interface between the description of the phenomenon and its application. It is a powerful strategy in overcoming student difficulties and has a clear and direct effect on students' understanding of the concepts. Due to its real-

time- interactive nature, the DSA strategy not only makes the student learn the principles of science but also gets their enthusiastic participation. It is an excellent way to stimulate the interest of even the students who may not have been excited about taking a course in pharmacology/neuroscience. I am glad to say that the National Science Foundation (NSF) regarded this as a powerful and innovative strategy to teach undergraduate and graduate courses. I received an NSF-Scholarship "Teaching Neuroscience for Undergraduates," conducted by Cornell University in June 1997. I was also invited by the Alabama Academy of Sciences to present my work on DSA in June 1999.

The best judges of the teacher are the students, and I have consistently been rated "excellent - outstanding" by student evaluations. It is a pleasure to say that I frequently receive letters of appreciation from former students stating how they have enjoyed my teaching style. This is one of the best rewards a teacher can receive. I have immense satisfaction and joy in communicating what I know to others. I have a genuine interest in teaching and firmly believe that excellent performance by the instructor alone is not sufficient to develop a smooth flow of communication; instead, the teacher needs to develop a partnership with the students

1. COURSES TAUGHT: Auburn University

- **Integrated Pharmacotherapy II (PYDI 9480)** 2018 fall - present
Depression – Neurotransmitters associated with depression.
Pathophysiology of depression, receptor targets for treatment of depression. Relationship between depression and antidepressant drug therapy.
- **Drugs & Diseases II (PYDI 5100)** 2007 spring - 2017
Adrenergic dysregulation, depression, bipolar disease, migraine
- **Drugs & Diseases III (PYDI 5200)** 2006 summer -2017
Anxiety, insomnia, epilepsy & diabetes
- **Drugs & Diseases IV (PYDI 5300)** 2006 Fall -2008 Fall
Hypertension, coronary artery disease, myocardial infarction
- **Principals of Drug Action II (PYPS 5220)** January 2001-2006
Serotonergic & GABAergic systems
- **Human Pathology (PYPP 5260)** August 2002 - 2004
Pathophysiology of cardiovascular systems
- **Pharmacotherapy Modules (PYDI 5360-5530)** January 2000-2002
This is an interdisciplinary course that integrates basic sciences, socio-behavioral sciences & clinical pharmacy practice. This team-taught course is developed and taught by faculty from all three disciplines. Web based presentations, small & large group facilitation, and case-based teaching were utilized.
- **Infectious Disease Module (PYPD 5520)** Fall 2001
- **HORD Module (PYPD 5510)** 2001 Fall
Large group facilitation
- **Cardiology Module (PYPD 5410)** 2004 Fall
Large and small group facilitation
- **Special Problems (PYPS 5900)** 2001 Spring - present

Discussion on neuropathology of Alzheimer's disease.
Utilized interactive computer simulations to demonstrate basic concepts in neurophysiology.

- **Special Problems (PYPS 7900, 8900)** 2001 Spring – present
Discussion of literature related to graduate student research that includes synaptic dysfunction during aging and in conditions like Alzheimer's disease, Parkinson's disease and schizophrenia.
- **Special Problems (PYPS 7900, 8900)** 2001 Spring - present
Group discussion on graduate student research "Read & critique" journal articles
Lectures on "strategies for effective presentation"
- **Pharmacology II (PYPS 6320)** 2001 Spring – present
- **Neuropharmacology (PYPS 7300) & Neuropharmacology of Drug Abuse (PYPS 7360)** 2001 fall – present
- **Pharmacology Research Methods (PYPS 7330)** 2002 Spring – present
Lectures on receptor physiology and electrophysiology of the neuron provided hands on laboratory sessions on brain slice, slice cultures, neuronal and single receptor electrophysiology and behavioral techniques. Provided comprehensive training on data analysis.
- **Pharmacology I, II, & III (PYPS 6010, 6020 & 6030)** 2002 Spring – present

2. COURSES DEVELOPED & TAUGHT:

- **Integrated Organ System Pharmacology I & Integrated Organ System Pharmacology II. (DRDD 7349 & DRDD 7350)**
Presents, in an integrated manner, pathophysiology and chemical, pharmacological and biotechnology principles action to explain the action of drugs.
- **Cellular & Molecular Pharmacology I Cellular & Molecular Pharmacology II. (DRDD 7360 & DRDD 7370)**
Cellular biology course integrated with Pharmaceutical Sciences for the study of pharmacologically related mechanisms at molecular and cellular levels.
- **Neuroscience Methods (DRDD 7280)**
This course is designed to provide a conceptual and practical understanding of several of the most common techniques in neuroscience. The interactive lectures will serve to illustrate the ways in which various experimental approaches have been used to advance specific areas of neuroscience, particularly in the context of neuropsychological diseases or processes
- **Neuropharmacology of Drug Abuse (DRDD 7290)**
An in-depth study of drugs of abuse, including mechanisms of action pharmacokinetics, addiction, physical dependence and the effects of drug use during pregnancy. Substance abuse treatment strategies will also be discussed.

1. COURSES TAUGHT:

- **General Biology (Biology 111 & 112)** 1993 Fall –1995 Fall
- **Organismic Biology (Biology 120)** 1994 Summer –1995 Summer
- **Cell & Genetic Biology (biology 230)** 1994 Fall –1998 Fall
- **Computer Assisted Program for teaching Neuroscience Laboratory**
Used the computer programs "Neurosim" and "Neuron" for understanding the electrophysiology of the nerve cell. This program is used in the laboratory component of the two new neurobiology courses. Neurobiology courses I have introduced are as follows:
 - **Biology 596 (Neuroscience)**
 - **Biology 315 (General Neurobiology)**

2. COURSES DEVELOPED & TAUGHT:

- **Neurobiology (Biology 315)** 1994 Fall – 2000 Fall
Undergraduate lecture laboratory courses that utilizes the Description, Simulation and Application (DSA) technique that I developed
- **Neuroscience (Biology 596)** 1994 Fall – 2000 Fall
Graduate lecture laboratory courses that utilizes the DSA technology. Lectures include neuroanatomy and neurophysiology. Developed a laboratory manual for this course.

C. Invited Chair/ guest presentations

2021 (July).....Hospital for Sick Children, University of Toronto, Canada (Virtual)
2020 (August).....Hospital for Sick Children, University of Toronto, Canada
2020 (August).....Hospital for Sick Children, University of Toronto, Canada
2017 (June).....China Pharmaceutical University, Nanjing, PRC
2017 (June).....Jiangnan University, Wuxi, PRC
2017 (June).....Hebei Medical University, Hebei, PRC
2017 (June).....China Agricultural University, Beijing, PRC
2017 (June).....Ocean University of China, Qingdao, PRC
2017 (June).....Yangzhou College of Veterinary Medicine, PRC
2016 (July).....Jining Medical University, Rizhao, China
2016 (October).....QuFu Normal University, QuFu, China
2016 (July).....Hospital for Sick Children, University of Toronto, Canada
2015 (July) Hospital for Sick Children, University of Toronto, Canada
2014 (July) Hospital for Sick Children, University of Toronto, Canada
2014 (July) Hospital for Sick Children, University of Toronto, Canada
2013 (July) Hospital for Sick Children, University of Toronto, Canada
2012 (June) International Society Alcoholism, Atlanta, GA
2011 (July) International Symposium on Biophotonics, Russia (not attended)
2010 (July) Hospital for Sick Children, University of Toronto, Canada
2009 (July) Hospital for Sick Children, University of Toronto, Canada
2008 (November) . .Duke University, Durham, North Carolina

- 2008 (July).....Western University of Health Sciences, Pomona, California
 2008 (July)Hospital for Sick Children, University of Toronto, Canada
 2008 (June).....World Cancer Conference (Nuclear Receptors), Shanghai, China (not attended)
 2007 (January) University of Melbourne, Australia
 2007 (July) Technological Advances in Science, Medicine & Engineering, Ontario, Canada
 2006 (March) University of Connecticut, Health Science Center, Farmington, Connecticut
 2006 (July) Technological Advances in Science, Medicine & Engineering, Ontario, Canada
 2005 (July) Technological Advances in Science, Medicine & Engineering, Ontario, Canada
 2004 (July) Asian Television network, Toronto, Ontario, Canada
 2004 (July) Technological Advances in Science, Medicine & Engineering, Ontario, Canada
 2003 (July) Technological Advances in Science, Medicine & Engineering, Ontario, Canada
 2003 (December) . University of Peradeniya, Kandy, Sri Lanka
 2002 (July) Technological Advances in Science, Medicine & Engineering, Ontario, Canada
 2001 (July) Health Science Center, University of Western Ontario, Canada
 2001 (December) . Indian Institutes of Science, Bangalore, India
 2000 (July) Bioscience & Technology Conference, University of Guelph, Ontario, Canada
 2000 (March) American Society for Neurochemistry, Chicago
 1999 (April) School of Veterinary Medicine, Tuskegee University, Alabama
 1999 (March) Alabama Academy of Science, Athens, Alabama
 1999 (March) Morehouse School of Medicine, Atlanta, Georgia
 1999 (July) North American Biomedical Association, University of Guelph, Ontario, Canada
 1998 (December) . Hospital for Sick Children and University of Toronto, Ontario, Canada
 1998 (October).....Specialized Neuroscience Research Program. Workshop, National Institute for Neurological Disorders and Stroke at NIH, Bethesda, Maryland
 1998 (July) North American Biomedical Association, University of Guelph, Ontario, Canada
 1998 (February) .. Boys-Town Research Hospital, Omaha, Nebraska
 1997 (July) North American Biomedical Association, University of Guelph, Ontario, Canada

D. Media Coverage of Research:

- 2019 (April)**News Week** ‘Pregnant women are using marijuana for morning sickness: study on rats suggests this could affect baby’s brain’
 2019 (April)**Daily Mail - UK** ‘Pregnant women are using marijuana for for morning sickness affect part of the baby’s brain associated with memory’

- 2019 (April) **Metro - UK** ‘Pregnant women are using weed to combat morning sickness and it’s a very bad idea’
- 2019 (April).....**MSN News** ‘Cannabis for morning sickness could affect baby’s brain’
- 2019 (April)**Business Standard** ‘Marijuana for morning sickness? It's not great for babies brain’
- 2019 (April)**EurekAlert AAAS** ‘Marijuana for morning sickness? It's not great for baby’s brain’
- 2019 (April)**Science Daily** ‘Real risks associated with cannabis exposure during pregnancy’
- 2019 (April)**VisEmbryo** ‘Marijuana For Morning Sickness Bad For Baby’
- 2019 (April)Earth ‘Marijuana is not a safe treatment for pregnancy morning sickness’
- 2019 (April)**Health News Digest** ‘Marijuana for morning sickness? It’s not great for baby’s brain’
- 2019 (April)**Life Science News** ‘Study assesses impact of cannabis on developing fetus’
- 2019 (April)**Economics Times India** ‘Use of marijuana during pregnancy can adversely affect offspring’s brain’
- 2013 (July)FM1, Ontario, Canada ‘Diabetes and Alzheimer’s link’
- 2013 (July)Asian Television Network, Ontario, Canada
- 2006 (November).....Press Release Conference, Atlanta, GA
- 2005 (October).....Press release Conference, Washington DC
- 2002 (July)Asian Television Network, Ontario, Canada
- 1999 (June)North Carolina Public Television

E. Graduate Students Summary:

PhD in Pharmaceutical Sciences (Chair/Co-chair):

Student	Role	Degree	Years	Current Position
Thirumalini Subramaniam	Chair	Ph.D.	2000-2005	Assistant Professor, University of Tennessee Health Science Center
Patrick Kanju	Chair	Ph.D.	2000-2005	Senior Scientist, Duke University
Nayana Wijayawardhane	Chair	Ph.D.	2003-2007	Professor & Clinical Director, University of Sri Lanka
Catrina Sims	Chair	Ph.D.	2003-2007	Associate Professor, Medical University of South Carolina
Kodeeswaran Parameshwaran	Chair	Ph.D.	2004-2008	Assistant Professor, Texas A&M University
Subramaniam Uthayathas	Co-chair	Ph.D.	2005-2009	Research Associate, Emory University Medical School
Sibel Ilbasemis-Tamer	Co-chair	Ph.D.	2008	Assistant Professor, University of Ankara, Turkey
Brian Shonesy	Chair	Ph.D.	2006-2010	Research Assistant Professor, Vanderbilt University

Senthilkumar Shanmugam	Co-chair	Ph.D.	2004-2009	Research Assistant Professor, John Hopkins University
Bessy Thrash	Co-chair	Ph.D.	2003-2009	Research Associate, University of Alabama
Karikaran Thiruchelvam	Co-chair	Ph.D.	2007-2011	Research Fellow, Michigan University
Engy A. Abdel-Rahman	Chair	Ph.D.	2008-2012	Associate Professor, University of Cairo, Egypt
Manal Buabeid	Chair	Ph.D.	2008-2013	Assistant Professor, Ajman University, UAE
Subhrajit Bhattacharya	Chair	Ph.D.	2011-2015	Assistant Professor (Research), School of Pharmacy, Auburn University
Ahmad Alhowail	Chair	Ph.D.	2012-2017	Assistant Dean, Qassim University, Saudi Arabia
Dwipayana Bhattacharya	Co-chair	Ph.D.	2013-2015	Assistant Professor, Lake Erie College of Osteopathic Medicine
Jenna Bloemer	Chair	Pharm.D. Ph.D.	2014-2020	Assistant Professor, Touro University, New York
Manoj Govindarajulu	Co-chair	Ph.D.	2016-2020	Post-Doctoral Fellow - Walter Reed Army Institute of Research, Maryland
Priyanka Das	Chair	Ph.D.	2016-2020	Post-Doctoral Fellow, University of California, Irvine
Warren Smith	Chair	Pharm.D. Ph.D.	2016 -	
Adrienne Courville	Chair	Pharm.D. Ph.D.	2020 -	
Kawsar Chaudry	Chair	Ph.D.	2020 -	
Miles Wiley	Chair	Ph.D.	2021 -	

Ph.D. in Pharmaceutical Sciences (Committee Member):

Student	Years
Sanjay Birru	2000 – 2005
Hui Min Chan	2003 – 2008
Manuj Ahuja	2009 – 2013
Wansu Ma	2010 – 2014
Gayani Nanayakara	2010 – 2014
Sourashish Nag	2011 – 2012
Isha Dhande	2011 – 2012
Jiansheng Huang	2011 - 2014
Shravanthi Mouli	2012 - 2016
Yiwei Liu	2012 - 2016

Abdullah Alasmari	2013 - 2017
Lingxin Zhang	2013 - 2017
Chan Wang	2014 - 2018
Mohammed Nasrullah	2014 - 2019
Thamer Alqurashi	2014 - 2019
Sharay Setti	2015 - present
Jared Senfeld	2017 - present
Qianman Peng	2017 - present
Saud Alqahtani	2017 - present
Shenqi Qian	2018 - present
Yi Shi	2018 - present

PhD in Other Programs (Committee Member):

Student	Years	Degree
Amul Thottae	2000 – 2005	Chemical Engineering
Kelly Banna	2002 – 2007	Psychology
Jianjong Jang,	2004 – 2008	Biological Sciences
Hui Gao	2004 – 2008	Biomedical Science
Prithiviraj Das	2007 – 2013	Entomology
Xiulei Mo	2011– 2014	Biomedical Science
Lauren Woodie	2015 – 2020	Nutrition

MS in Pharmaceutical Sciences (Chair/Committee Member):

Student	Years
Fatima Aldajani (Chair)	2012 - 2015
Mohammed Majrashi	2015 - 2017
Mohammed Almaghrabi	2016 - 2018
Ryan Heslin	2016 - 2018
Darshini Desai	2017 - 2018
Mingliu Zhao	2017 - 2020
Saud Alqahtani	2017 - present
Jeremiah Pfitzer	2018 - present

MS in Biological Sciences (Committee Member):

Student	Years
Michael Carra	2005 – 2007
Kelly Banna	2003 – 2007
Amy Muncaster	2005 – 2007

Professional (Doctor of Pharmacy) Student Trainees:

Student	Years
Susan Duggins	2001 – 2002
Michael Smith	2002 – 2003
Tara Smith	2002 – 2003
Victor Hunt	2004 – 2005
Lance Eiland	2005 – 2006
Virginia Robertson	2004 – 2005
Meredith Tate	2014 – 2016
Jamie Key	2014 – 2016

Post-Doctoral Trainees/Research Faculty:

Student	Years
Dr. Kollappa Prem Kumar	1997 – 1998
Dr. K. Parameshwaran	2008 – 2009
Dr. Xiong Wu	2009 – 2010
Dr. Manal Buabeid	2013 – 2014
Dr. Yifeng Du	2017 – 2019
Dr. Subhrajit Bhattacharya	2020 – present

Tuskegee University, Department of Biology:

MS in Biology (Chair):

Student	Years
David Ware	1994 – 1997
Lorraine McCall	1994 – 1997
Xenoria Causey	1994 – 1997
Lynnee January	1998 – 2000
Vinson Barnes	1998 – 2000
Verneshia Robinson	1998 – 2000
Antonio Bowens	1998 – 2000
Solomon Yilma	1997 – 2000
Elgin Green	1999 – 2002
Patrick Kanju	1999 – 2002
Thiru Subramaniam	1999 – 2002

MS in Biology (Committee Member):

Student	Years
Sheryl Thompson	1994
Erman Munir	1995
Dorothy Wallaby	1996
Annie Gamil	1996
Quinee Brown	1999

a. Primary Doctoral Advisor (Chair/Co-chair)	23
b. Primary Masters Advisor (Chair/Co-chair)	12
c. Dissertation (Ph.D.) Committee Member	28
e. Thesis (M.S.) Committee Member	15

F. Research/Creative Work

Grants and Contracts

Extramural Grants:

“Alabama State University-Auburn University Partnership to Promote Diversity in Aging Research”

Principal Investigators (MPI): Manoj Mishra/**Vishnu Suppiramaniam**

Agency: NIH 1 R25 AG070244-01A1

Period: 11/01/2022- 10/31/2027 **Amount: \$ 1,866,800**

Score: 20

“Graduate Research Training Initiatives for Student Enhancement (G-RISE) at Auburn University”

Principal Investigators: Bruce Smith

Collaborator and Mentor: Vishnu Suppiramaniam

Agency: NIGMS 1 T32 GM141739-01

Period: 06/2021 - 05/2026 **Amount: \$ 1,500,484**

“Elucidation of Molecular Mechanisms of Prenatal Cannabinoid Exposure: Identification of Targets and Therapies”

Principal Investigators: **Vishnu Suppiramaniam (contact PI)**/Miranda Reed (MPI)

Agency: NIH 1 R01 DA046723-01

Period: 04/2020 - 03/2025 **Amount: \$ 1,723,450**

Score: 14 (3%)

“Elucidation of Molecular Mechanisms of Prenatal Cannabinoid Exposure: Identification of Targets and Therapies” – *Administrative supplement*

Principal Investigators: **Vishnu Suppiramaniam (contact PI)**/Miranda Reed

(MPI)/Subhrajit Bhattacharya (co-I)

Agency: NIH 3 R01 DA046723-02S1

Period: 08/2021 - 07/2024 **Amount: \$ 143, 637**

“Identifying therapeutic target to rescue learning and memory deficits following prenatal cannabinoid exposure”

Agency: Pharmaceutical Research and Manufacturers of America (PhRMA) Foundation

Principal Investigators: Priyanka Pinky and **Vishnu Suppiramaniam**

Period: 1/1/2020 – 12/1/2021 **Amount: \$ 25,000**

“Novel Intranasal Pramlintide Administration for the Dissection of Metabolic and Cognitive Outcomes of Amylin-based Therapies in a Transgenic Mouse Model of Alzheimer’s Disease
Agency: Pharmaceutical Research and Manufacturers of America (PhRMA) Foundation

Principal Investigators: Warren Smith/Miranda Reed/ **Vishnu Suppiramaniam**
Period: 08/2019 – 07/2022..... **Amount: \$ 20,000**

“Novel PPAR agonist for mitigating Alzheimer’s disease”
Co-investigators: **Vishnu Suppiramaniam** & Robert Arnold
Principal Investigator: Rajesh Amin
Agency: NIH - SBIR
Period: 10/01/2019 - 12/30/2021 **Amount: \$ 440, 000**

“Dissection of Metabolic and Cognitive Outcomes of Amylin based Therapies in a Transgenic Mouse Model of Alzheimer’s Disease”
Agency: American Foundation for Pharmaceutical Education
Principal investigators: Warren Smith & **Vishnu Suppiramaniam**
Period: 8/31/19 – 8/30/20 **Amount: \$10, 000**

ASPET Young Scientist Travel Award
Recipient: Priyanka Pinky; **Primary Mentor; Suppiramaniam**
Agency: American Society for Pharmacology
Period: January 2019 **Amount: \$ 800**

AACP Top 16 abstracts
Recipient: Priyanka Pinky; **Primary Mentor; Suppiramaniam**
Agency: American Association of Clinical Pharmacology
Period: May 2019..... **Amount: \$ 800**

“Novel Partial PPAR-Gamma Agonist Improve Pathology and Memory Deficits in a 3xTg-AD Mouse Mode”
Principal Investigators: Rajesh Amin/**Vishnu Suppiramaniam**
Agency: NIH/R15
Period: 9/1/2015 – 8/31/2019 (no cost extension)..... **Amount: \$ 361, 955**

“Antioxidant-mediated Protection from Mitochondrial Dysfunction-induced Neuropathology”
Co-investigator: **Vishnu Suppiramaniam**
Principal Investigator: Carl Pinkert
Agency: Foundation for Cure from Mitochondrial Diseases
Period: 10/1/2013-09/31/2015 **Amount: \$ 469,680**

“Nerve Growth Factor Signaling in P62 Knock Out Mouse”
Co-investigator: **Vishnu Suppiramaniam**
Principal Investigator: Marie Wooten
Agency: NIH/NINDS
Period: 3/1/2005-2/28/2008 **Amount: \$ 1,100,000**

"Assessment of the Developmental Teratogenicity of Nicotine: Pharmacological Intervention by Nootropic Drugs”
Principal Investigator: **Vishnu Suppiramaniam**
Program Director: Charles Breese
Agency: Philip Morris

Period: 5/1/2003-4/30/2006.....**Amount: \$ 795,771**

“Modulation of Glutamate AMPA Receptor by Polysialic Acid”

Principal Investigator: **Vishnu Suppiramaniam**

Number: GM008091-310041

Agency: NIH/NIGMS

Period: 06/1/2002-05/30/2006.....**Amount: \$ 820,000**

“In Vitro Modeling of Olfactory Neurons”

Principal Investigator: **Vishnu Suppiramaniam**

Number: RR003059-110009

Agency: NIH/NIGMS

Period: 06/1/1998-5/31/2002.....**Amount: \$ 400,000**

“Modulation and Characterization of Glutamate (AMPA) Receptors”

Principal Investigator: **Vishnu Suppiramaniam**

Number: NS 02018

Agency: NIH

Period: 10/1/97-9/30/02.....**Amount: \$ 391,000**

“Functional Reconstitution of AMPA Receptors in Bilayers”

Principal Investigator: **Vishnu Suppiramaniam**

Number: GM-080906

Agency: NIH

Period: 04/1/1995 - 05/1/1998.....**Amount: \$209,000**

“Initiative for Minority Students: Bridges to the Doctoral Degree”.

Co-Investigator: **Vishnu Suppiramaniam**

Agency: NIH, NIGMS

Period: 01/13/99**Amount: \$320,000**

“Instrumentation for Enhanced Discovery and Learning in Biotechnology”.

Co-Investigator: **Vishnu Suppiramaniam**

Number: DAAG55-97-R-BAA5

Agency: Army Research Office

Period: 02/1/1998**Amount: \$400,000**

“Research Apprentice Program” (REAP)

Principal Investigator: **Vishnu Suppiramaniam**

Agency: Army Research Office

Period: 06/01/1998**Amount: \$ 5000**

“Research Apprentice Program” (REAP)

Principal Investigator: **Vishnu Suppiramaniam**

Agency: Army Research Office

Period: 06/01/1997**Amount: \$ 5000**

“Research Apprentice Program” (REAP)

Principal Investigator: **Vishnu Suppiramaniam**

Agency: Army Research Office

Period: 06/01/1996 **Amount: \$ 5000**

“Research Apprentice Program” (REAP)

Principal Investigator: **Vishnu Suppiramaniam**

Agency: Army Research Office

Period: 06/01/1995 **Amount: \$ 5000**

Extramural Grants Submitted

Role of Central TGR5 in Alzheimer's Disease and Underlying Mechanisms

Principal Investigators: **Vishnu Suppiramaniam (MPI)**/Miranda Reed (contact PI)

Agency: NIH 1 R01 AG0075991-01

Period: 09/2021 - 08/2026 **Amount: \$ 1,723,450**

Scored, not funded – resubmission in June 2022

Loss-of-function NMDAR mutations in pediatric epilepsy: role of the thalamo-cortical circuit

Principal Investigator: Subhrajit Bhattacharya (PI)/**Vishnu Suppiramaniam (Co-I)**

Agency: NIH 1 R01 AG0075991-01

Period: 09/2021 - 08/2026 **Amount: \$ 1,826,321**

Not funded – resubmission in October 2022

Intramural Grants:

“Elucidation of molecular mechanisms of prenatal cannabinoid exposure: Identification of targets and therapies”

Agency: Auburn University Internal Grants Program (AU IGP)

Principal investigators: Reed MN

Co-principal investigator: **Vishnu Suppiramaniam**

Period: 3/1/2019-4/30/2021 **Amount: \$44,747**

“Nerve Growth Factor Administration for Treating Type2 Diabetes Linked Alzheimer’s Disease”

Agency: Alabama Agricultural Experimental Station

Principal Investigator: Ramesh Jeganathan

Co-investigator: **Vishnu Suppiramaniam**

Period: 10/1/18- 9/30/21 **Amount: \$ 140, 500**

“Establishment of a Center for Neuroscience”

Principal Investigator: **Vishnu Suppiramaniam**

Agency: Presidential Award for Innovative Research (PAIR)

Period: 7/1/18- 6/30/21 **Amount: \$ 637, 500**

“Molecular Mechanisms of Chemotherapy Induced Memory Loss”

Principal Investigator: **Vishnu Suppiramaniam**

Agency: Auburn University Research Initiative in Cancer

Period: 8/1/15- 7/31/17 **Amount: \$ 200, 000**

“Molecular Mechanisms of Chemotherapy Induced Memory Loss”
Principal Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University Research Initiative in Cancer
Period: 7/1/14- 7/31/15.....**Amount: \$ 20, 000**

“Microelectrode Array System: Electrical Measurements from
Brain, Heart, Muscle & More
Co-Principal Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 2/1/12- 1/31/13.....**Amount: \$ 60, 000**

“Integrin Linked Kinase, Synaptic Plasticity and Memory: The Diabetes, Alzheimer’s Link”
Principal Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 2/1/11- 1/31/13.....**Amount: \$ 93, 352**

“Thiazolidinediones Rescue Impaired AMPA Receptor-Mediated Transmission in
STZ-diabetes”
Principal Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 5/1/2007-4/30/2009.....**Amount: \$ 29, 252**

“Sildenafil (Viagra) in Alzheimer’s Disease”
Co-Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 5/1/2007-4/30/2009.....**Amount: \$ 10, 000**

“Neuroprotection Against Environmental Neurotoxins”
Co-Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 2006.....**Amount: \$ 3, 000**

“Role of Glutamatergic Function on Nicotinic Receptor Regulation”
Co- Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 5/1/2002-4/30/2004.....**Amount: \$ 47,468**

“Induction of Lysosomal Dysfunction in Hippocampal Neurons: A Model to Investigate
Alzheimer’s Disease”
Principal Investigator: **Vishnu Suppiramaniam**
Agency: Auburn University
Period: 5/1/2002-4/30/2004.....**Amount: \$ 40,126**

Statement of Research

I joined Auburn University in 2001, at a time when it could best be characterized as a teaching institution. There were no more than 4 NIH-RO1 grants at any given time. I started a research laboratory with limited startup funds (\$50,000) and developed it into a neurophysiology laboratory capable of performing single ion channel, intracellular, extracellular, and in vivo electrophysiological recordings along with molecular, biochemical, and behavioral methodologies.

One of the unique techniques that we developed in our laboratory was to directly record single ion channel currents of synaptic neurotransmitter receptors. There are currently no other techniques available to directly measure the functionality of synaptic receptors, which is a critical measure of synaptic transmission. We use an upstream approach to investigate how modifications in the electrical properties (Channel open probability, conductance, dwell time distribution and burst activity) of single synaptic glutamate (AMPA & NMDA) receptor will alter the electrical properties of the neurons in; animal and tissue models of neurodegeneration (J. Neuropathol. Exp. Neurol. 2007, 66:779-788; Exp. Neurol. 2008, 214:55-61), and animal models of diabetes and prenatal alcohol/nicotine exposure. When electrical properties of a group of neurons are altered, this may lead to dysfunction of specific regions of the brain and in turn can cause behavioral deficits. Currently, we have the technology available to investigate how modifications in electrical properties of single synaptic glutamate receptors (synaptosomal recording) can lead to altered synaptic currents (whole cell patch clamp technique), which in turn may modify plasticity mechanisms (slice and in vivo electrophysiology) resulting in behavioral deficits (Morris Water Maze, Y-Maze, & fear conditioning) in animal models of Alzheimer's disease and diabetes. Collaborating with faculty members in our department with expertise in cutting-edge molecular biology techniques, we have already begun to probe the intracellular signaling pathways that contribute to altered expression and modified electrical properties of synaptic glutamate receptors in animal models of diabetes and Alzheimer's disease. The recent projects in the laboratory include **i)** elucidating the mechanism of memory loss in “**chemobrain**” and rescue by a novel selenide compound, **ii)** time-dependent receptor trafficking and synaptic plasticity during memory reconsolidation, **iii)** illustrating the role of Integrin-linked kinase (ILK) in synaptic plasticity and memory, and **iv)** elucidation of molecular mechanisms of cognitive deficits due to prenatal cannabis exposure.

Research highlights of the laboratory:

Our laboratory was the first to **i)** develop a novel technique to directly measure the single ion channel properties of synaptic AMPA and NMDA receptors and demonstrate the interactive (cooperative) channel gating of synaptic AMPA receptors (*Methods Enzymol* 2006, 417:80-90). **ii)** illustrate the direct modulation of synaptic AMPA receptors by the Alzheimer peptide Ab1-42, **iii)** demonstrate the direct modulation of AMPA receptors by PSA and thereby establishing the neuroprotective role for PSA (*J Biol Chem* 2004 279:47975-47984), **iv)** identify subunit and region specific modulation of NMDA receptors by NCAM-PSA (*J Biol Chem* 2006 281:34859-34869; *J Neurosci* 2010 17:30 (11):4171-83), **v)** elucidate the molecular mechanism of memory loss in prenatal alcohol (*Neurobiol Dis* 2007, 26:696-706) and nicotine exposure (*Cell Mol Life Sci.* 2012 69 (5):829-41) as well as identifying a possible therapeutic option (*Neurobiol Dis* 2008, 29:81-91) and **vi)** illustrate the role of dimmer interface AMPA receptor channel kinetics (*Proc Natl Acad Sci U S A.* 2010 25; 107 (21):9891-6).

Peer Reviewed Publications

1. Pinky PD., Pfitzer JC., Senfeld J., Hong H., Bhattacharya S., Suppiramaniam V., Qureshi I., & Reed MN. (2022). Recent Insights on Glutamatergic Dysfunction in Alzheimer's Disease and Therapeutic Implications. *Neuroscientist*, 2022 Jan 25:10738584211069897. doi: 10.1177/10738584211069897. Online ahead of print.
2. Hunsberger HC., Setti SE., Rudy CC., Weitzner DS., Pfitzer JC., McDonald KL., Hong H., Bhattacharya S., **Suppiramaniam V.**, & Reed MN. (2021). Differential Effects of Human P301L Tau Expression in Young versus Aged Mice. *International Journal of Molecular Sciences*. [https://doi: 10.3390/ijms222111637](https://doi.org/10.3390/ijms222111637). (Impact Factor 5.9)
3. Ahmad, A., Priyanka, P., Matthew, E., Bloemer, J., Woodie, L., Buabeid, M., Bhattacharya, S., Shanese, J., Bhattacharya, D., Dhanasekaran, M., Escobar, M., Arnold, R., & **Suppiramaniam, V.** (2021). Doxorubicin induces dysregulation of AMPA receptor and impairs hippocampal synaptic plasticity leading to learning and memory deficits. (*Cell press*). *Heliyon*. [https://doi: 10.1016/j.heliyon.2021.e07456](https://doi.org/10.1016/j.heliyon.2021.e07456). (Impact Factor 2.8)
4. Pinky, PD., Majrashi, M., Fujihashi, A., Bloemer, J., Govindarajulu, M., Ramesh, S., Reed, MN., Moore, T., **Suppiramaniam, V.**, & Dhanasekaran M. (2021). Effects of prenatal synthetic cannabinoid exposure on the cerebellum of adolescent rat offspring. *Heliyon*. (*Cell Press*) [https://doi: 10.1016/j.heliyon.2021.e06730](https://doi.org/10.1016/j.heliyon.2021.e06730). (Impact Factor 2.8)
5. Majrashi, M., Altukri, M., Ramesh, S., Govindarajulu, M., Schwartz, J., Almaghrabi, M., Smith, F., Thomas, T., **Suppiramaniam, V.**, Moore, T., Reed, M., & Dhanasekaran M. (2021). β -hydroxybutyric acid attenuates oxidative stress and improves markers of mitochondrial function in the HT-22 hippocampal cell line. *Journal of Integrative Neuroscience*, 20(2):321-329. [https://doi: 10.31083/j.jin2002031](https://doi.org/10.31083/j.jin2002031). (Impact Factor 2.1)
6. Chen, F., Fang, S., Du, Y., Ghosh, A., Reed, MN., Long, Y., & **Suppiramaniam, V.**, Tang, S., Hong H. (2021). CRISPR/Cas9-mediated CysLT1R deletion reverses synaptic failure, amyloidosis and cognitive impairment in APP/PS1 mice. *Aging* 13(5):6634-6661. [https://doi: 10.18632/aging.202501](https://doi.org/10.18632/aging.202501). (Impact Factor 4.2)
7. Alatawi, Y., Hansen, RA., Chou, C., Qian, J., **Suppiramaniam, V.**, & Cao, G. (2021). The impact of cognitive impairment on survival and medication adherence among older women with breast cancer. *Breast Cancer*, 28(2):277-288. [https://doi: 10.1007/s12282-020-01155-3](https://doi.org/10.1007/s12282-020-01155-3). (Impact Factor 4.2)
8. *Petrisko, *TJ., Bloemer, J., Pinky, PD., Srinivas, S., Heslin, RT., Du, Y., Setti, SE., Hong, H., **Suppiramaniam, V.**, Konat, GW., & Reed, MN. (2020) Neuronal CXCL10/CXCR3 Axis Mediates the Induction of Cerebral Hyperexcitability by Peripheral Viral Challenge. *Frontiers in Neuroscience*, 24:14:220. [https://doi: 10.3389/fnins.2020.00220](https://doi.org/10.3389/fnins.2020.00220). (Impact factor 3.6) (*equal contribution)

9. Alhowail, A., Zhang, LX., Buabeid, M., Shen, JZ., & **Suppiramaniam, V.** (2020). Role of the purinergic P2Y2 receptor in hippocampal function in mice. *European Review of Medical and Pharmacological Sciences*. 24(22):11858-11864. https://doi:10.26355/eurrev_202011_23843. (Impact Factor 1.5)
10. Govindarajulu, M., Pinky, PD., Steinke, I., Bloemer, J., Ramesh, S., Kariharan, T., Rella, RT., Bhattacharya, S., Dhanasekaran, M., **Suppiramaniam, V.**, & Amin, RH. (2020). Gut Metabolite TMAO Induces Synaptic Plasticity Deficits by Promoting Endoplasmic Reticulum Stress. *Frontiers in Molecular Neuroscience*, 12;13:138. <https://doi:10.3389/fnmol.2020.00138>. (Impact Factor 5.6)
11. Woodie, LN., Johnson, RM., Ahmed, B., Fowler, S., Haynes, W., Carmona, B., Reed, M., **Suppiramaniam, V.**, & Greene, MW. (2020). Western diet-induced obesity disrupts the diurnal rhythmicity of hippocampal core clock gene expression in a mouse model. *Brain Behavior and Immunity*, 88:815-825. <https://doi:10.1016/j.bbi.2020.05.053>. (Impact Factor 7.2)
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1. Pinky, P.D., Bloemer, J., Du, Y., Setti S.E., Heslin. R.T., Smith W.D, Dhanasekaran M, Reed, M.N, **Suppiramaniam, V**. Elucidation of molecular mechanisms of learning and memory deficits in adolescent offspring. Technological advances in Science, Medicine and Engineering conference (TASME). 24th Annual Virtual Symposium at the Sick Children's Hospital in Toronto, Canada, August 2020.
2. Pinky, P.D., Pfitzer, C. J., Qureshi, A.I., Berman, M. R., **Suppiramaniam, V.**, Reed, M.N. 'Troriluzole restores synaptic plasticity deficits in a 3xTg Alzheimer's disease model by modifying glutamatergic synaptic transmission' Webinar presentation at 'Alzheimer's Disease Drug Foundation Conference on Neurodegeneration'. Philadelphia, PA, April 2020.
3. Pinky, P.D., Majrashi, M., Ayaka, F., Bloemer, J., **Suppiramaniam, V.**, Dhanasekaran, M. 'Role of Prenatal Synthetic Cannabinoid Exposure on the Cerebellum of Adolescent Rat Offspring' VCOM Research Day, Auburn University, Auburn, AL, February 2020.
4. Patel, S., Ahuja. M., Ramesh. S., Govindarajulu, M., Almaghrabi, M., **Suppiramaniam. V.**, Moore, T., Dhanasekaran, M. Neuroprotective effects of Centella asiatica extract (CaE) against hydrogen peroxide induced oxidative stress in in-vitro hippocampal cell lines. Technological advances in Science, Medicine and Engineering conference (TASME) 24th Annual Virtual Symposium at the Sick Children's Hospital in Toronto, Canada, August 2020.
5. Mullins, C., Bhattacharya, D., Ramesh, S., Govindarajulu, M., Bloemer, J., Bhattacharya, S., Buabeid, M., Escobar, M., Moore, T., **Suppiramaniam, V.**, Dhanasekaran, M. Investigation of ILK signalling deficits in prenatal alcohol rats exposed to 7,8-dihydroxyflavone, Center for Neuroscience initiative-CNSi, Auburn, AL, February 2020.

6. Schwartz, J., Mohammed, M., Almaghrabi, M., Fujihashi, A., Ramesh, S., Reed, M., **Suppiramaniam, V.**, Dhanasekaran, M. “ β -hydroxybutyric acid”- A budding therapeutic drug for Dementia. Center for Neuroscience initiative-CNSi, Auburn, AL, February 2020.
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10. Schwartz, J., Majrashi, M., Almaghrabi, M., Fujihashi, A., Ramesh, S., Reed, M., **Suppiramaniam, V.**, Dhanasekaran, M. Elucidate the *in vitro* neuroprotective effects of ketone bodies in hippocampal HT-22 neurons. (2020) Auburn Research Day.
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Abstracts published in peer-reviewed journals:

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2. Karuppagounder S, Uthayathas, S, **Suppiramaniam, V.**, Dhanasekaran, M. Behavioral and neurochemical effect of environmental toxin (diquat). Annual meeting of Society of Toxicology 2009 Baltimore, MD (Published as a supplement to *Toxicological Sciences*, 2009, pp 445)
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Meeting Abstracts: (Selected)

1. *Pinky PD, @Bloemer J, *Smith, WD, *Setti S, *Heslin RT, Du, Y, Dityatev A, Dhanasekaran M, Bhattacharya S, Reed MN, Suppiramaniam V. "Elucidating mechanisms of prenatal cannabinoid exposure mediated learning and memory deficits in offspring: identifying therapeutic targets" Poster presented at 2021 Auburn University Student Research Symposium, Auburn, AL March 2021.
2. Majrashi M, Altukri M, Rames S, Govindarajulu M, **Schwartz J, Almaghrabi M, Smith F, Thomas T, Suppiramaniam V, Moore T, Reed MN, Dhanasekaran M. " β -hydroxybutyric acid attenuates oxidative stress and improves markers of mitochondrial function in the HT-22 hippocampal cell line". Poster presented at 2021 Auburn University Student Research Symposium, Auburn, AL March 2021.
3. Pfitzer JC, Pinky P.D., Qureshi I.A., Berman R.M., Suppiramaniam V.S., Reed M.N. Modifying Glutamatergic neurotransmission rectifies synaptic plasticity and memory deficits in a 3xTg Alzheimer's disease model. Harrison School of Pharmacy Seminar Series, Auburn AL, April 2021.
4. Pfitzer JC. Pinky P.D., Qureshi I.A., Berman R.M., Suppiramaniam V.S., Reed M.N. Modifying Glutamatergic neurotransmission rectifies synaptic plasticity and memory deficits in a 3xTg Alzheimer's disease model. Boshell Research Day, Auburn AL, September 2021.
5. Pinky, S. Yoo, M. Govindarajulu, J. Bloemer, R. Amin, V. Suppiramaniam, V. Mechanism of action of BNIP3 induced autophagy for amelioration of AD pathology. Alzheimer's Disease Drug Foundation Conference on Neurodegeneration. Long Beach, CA, March 2019
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7. Pinky, P.D., Bloemer, J. Setti, S. E., Heslin, R.T., Smith, W.D., Du, Y., Dityatev, A., Reed, M.N., **Suppiramaniam, V.** Mechanism of Prenatal Cannabinoid Exposure Mediated Memory Loss in Adolescent Offspring: Opportunities for Identifying Therapeutic Target. Experimental Biology, Orlando, FL, April 2019
8. Pinky P, Bloemer J, Setti S, Heslin R, Smith W, Du Y, Dityatev A, Reed M, **Suppiramaniam, V.** Identifying Drug Targets for Prenatal Cannabinoid Exposure Mediated Learning and Memory Deficits. American College of Clinical Pharmacology, Chicago, IL, September 2019
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11. Majrashi MA, Almaghrabi M, Ramesh S, Desai D, Govindarajulu M, **Suppiramaniam V**. Deruiter J, Clark CR, Dhanasekaran M. Investigate the neurotoxic effects of the designer drug TriFluoroMethylPhenylPiperazine derivatives. Society for Neuroscience meeting, 2017.
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Service and Outreach Activities

Sponsorship of Student Activities:

Auburn University:

2001 – 2003 Advisor to Student National Pharmaceutical Association

Tuskegee University:

1997 – 2000 Student summer research activities - Established collaboration with Vanderbilt University and Cornell University to accept Biology students for research training in Neuroscience

1997 – 2000 Established Collaboration with Boys-Town National Research Hospital, Omaha, Nebraska, to accept Biology majors (Tuskegee University) for pre-doctoral fellowship program in Neuroscience
Supported more than forty undergraduate, graduate students and high school summer trainees in various research projects in neuroscience

1994 – 1997 Summer Research Training for High School Students at Tuskegee Neuroscience Laboratory under Research Apprenticeship Program (REAP) by Army Research Office

Editorial Duties in peer reviewed journals:

2019 – present International Journal of Molecular Sciences

2018 – present Frontiers in Neuroscience

2015 – 2016 Neuronal Regeneration Research

2011 – present Clinical and Experimental Pharmacology

2011 – present Journal of Clinical Pharmacology & Biopharmaceutics

2007 – present World Journal of Biological Chemistry

Invited Reviewer:

2020 – present Brain Pathology

2020 – present Journal of Comparative Neurology

2020 – present Journal of Metabolic Brain Disease

2019 – present Nutritional Neuroscience

2013 – presentNeurobiology of Aging
2012 – presentNature Communications, Nature Publishing Group
2010 – presentEuropean Journal of Pharmacology
2009 – presentJournal of Neuroscience
2008 – presentNeuroscience
2007 – presentPhytotherapy Research
2007 – presentLife Sciences
2006 – presentNeuropharmacology
2001 – presentJournal of Neuroscience Research
2000 – presentSynapse
2000 – presentPLoS1

Grant review services:

2020 – 2021.....NIH Continuous submission privilege
2019 – present.....National Science Center, Poland
2016 – present.....Grant Reviewer, Study section member, ZRG1-ETTN-P (13)
2016 – present.....Grant Reviewer, Study section member, ETTN P13 F01B
2015 – present Grant Reviewer, Medical Research Council, United Kingdom
2012 – present Grant Reviewer, Netherlands Scientific Association
2012 – present Grant Reviewer, Alzheimer’s Association, United Kingdom
2011 – present Study section member, ZRG1 F03A (late submission privilege)
2011 – present Grant Reviewer, Department of Defense (DOD)
2010 – present Grant Reviewer, Alzheimer’s Association, USA
2010 Grant Reviewer, NIH Special Emphasis Panel
2009 Grant reviewer, NIH challenge grants
2008 – present Ad-hoc Grant reviewer, National Institutes for Environmental Health Sciences (NIH/NIEHS)

2004 – present Ad-hoc Grant reviewer, National Institutes for General Medical Sciences (NIGMS/NIH)
2003 – 2006 Biogrant Committee Member – Auburn University
2001 – 2002 Morehouse college, faculty research proposal reviewer

Community Services:

2014 – 2017 Alabama Loving Hearts Service Project, Montgomery, Alabama
1999 Judge, Alabama Junior Academy of Science paper reading contest
1996 – 2003 Organizer of “Share a meal” campaign, Auburn and Montgomery, Alabama
1995 – 1997 Judge, St. Joseph’s Catholic School Science Fair, Tuskegee, Alabama
1991 – 1992 Member, Auburn Greater Kiwanis Association

Professional Societies:

- Member, American Association for the Advancement of Science
- Member, Society for Neuroscience Member

- New York Academy of Science Member
- Alabama Academy of Science Member
- Sigma XI Scientific Research Society
- Member, National Council for Academic Advisors
- Executive Officer, NAT Bioscience & Technology Conference

International Committees:

- 2004 – present** Chair, program committee, Technological Advances in Science, Medicine & Engineering Symposium
- 2002 – present** Member of the Board of Directors, Academy for Advancement of Science, Medicine & Engineering
- 2004 – Present** Founding member, Technological Advances in Science, Medicine & Engineering Symposium Series
- 1997 – 2004** Founding Member, North American Bioscience & Technology Conference, Guelph, Ontario, Canada

Consultant services:

- 2015 – 2018** Consultant and Scientific Advisor, Kalgene Pharmaceuticals, Ontario, Canada
- 2005 – present** Consultant and member of the Board of Directors: Association for Advancement of Science - Non- profit organization based in British Columbia, Canada
- 1997 – 2001** Research Consultant to Cortex Pharmaceutical, Irvine, California
- 1997 – 2004** Consultant and Scientific advisor to North American Biomedical Conference, Guelph, Canada
- 1999 – 2000** Consultant - Boys-Town Research Hospital, Omaha, Nebraska