## Texas A&M Institute for Neuroscience (TAMIN) NRSC 485/491 Directed Studies/Research Opportunities

### **Finding a Lab**

- 1) Look through the list of attached labs. Keep in mind that the attached list does not include the entire faculty who are looking for students. Even if a member of the Faculty of Neuroscience is not on the list, they may still be taking students. Check the <u>TAMIN website</u> for additional faculty members and additional information regarding our faculty interests.
- 2) If you are interested in a faculty member's lab on the attached list, MAKE SURE that you meet the prerequisites.
- 3) Once you establish labs in which you meet the prerequisites and are interested in, you will either need to apply for the position and/or email the professor directly to arrange a meeting. When emailing a professor, let them know that you are interested in finding a lab, tell them who you are, major, classification and why you are interested in their research. Faculty members are very busy so don't expect an immediate response. Wait at least a week prior to sending a follow-up email.

### **What to Expect**

Different professors have different requirements, but a common guideline is 3 hours per week in the lab for each hour of credit. When meeting with a professor keep in mind how many hours per week you will be able to commit to the lab. Make sure to ask what the professor's expectations of you will be, will you be taking the course as a 485 or a 491 and for how many hours.

#### How to Register for a 485/491

- 1) Once you've found a lab, you will need to contact any other labs you've spoken with to inform them of your decision. It is absolutely OK to let a faculty member know that you've decided to join another lab. Faculty may have others who would like to join the lab, so it is important to let everyone know your decision.
- 2) Students will need to download a 485 or 491 <u>form</u> from the TAMIN website and have the supervising professor complete the form. Both student and professor will need to sign the form.
- 3) Forms should be submitted to the TAMIN advising office in ILSB 3148. **Contracts are due no later than one week PRIOR to the first day of classes.**

#### Directed Studies (NRSC 485) vs. Research (NRSC 491)

Up to 6 hours of NRSC 485/491 can be used towards the NRSC minor. Students taking a NRSC 491 should be engaged in active research under a member of the Faculty of Neuroscience. Students engaged in research should gain experience in carrying out the scientific method, including developing and testing a hypothesis, taking ownership of projects by planning and conducting experiments, collecting and analyzing data, developing conclusions and reporting observations either as scientific publications or as presentations. NRSC 485 students are typically engaged in a literature review relevant to their research topic and develop the ability to discuss scientific articles with their research mentor, graduate students, other faculty and/or postdocs.

Check the TAMIN website (tamin.tamu.edu) for additional information.

# Texas A&M Institute for Neuroscience 485/491 Opportunities

Faculty of Neuroscience Member	Course	Semester	Research Interests	Prerequisites/ Requirements	Additional Information	Contact/Application Information
Amrien, Hubert	491	All	imaging and behavioral analysis to identify	10 to 15 (flexible) hours per week, science major, 1 year commitment, GPA of 3.5 and above, career goal in Neuroscience, Biological Science or Medicine	Project dependent; may involve molecular biology, imaging of live cells, behavioral analysis or genetics; will closely work with Postdoctoral fellow.	amrein@tamhsc.edu
Anderson, Brian	485	All	Cognition and Cognitive Neuroscience: The lab does behavioral and neuroimaging studies examining how learning influences what people pay attention to.		Research Assistants will conduct eye tracking and electric shock studies, and there are potential opportunities to assist with brain imaging research (human fMRI).	<u>brian.anderson@tamu.edu</u>
Bernard, Jessica	485	All	Cognition & Cognitive Neuroscience: Learning & Aging Using Neuroimaging and Brain Stimulation		Students will help on a variety of studies investigating learning and aging. This work will take advantage of brain stimulation and brain imaging. Students will help primarily with running subjects on different tests on the computer, but also may help in administering the brain stimulation, as well as tests of balance. There will be a lot of time spent interacting with subjects from the subject pool, and from the Bryan-College Station community. Students will also help with entering data into spreadsheets and preparing data for analysis.	<u>Jessica.bernard@tamu.edu</u>
Bolaños- Guzmán, Carlos	485/491	All	Neuroscience: Mechanisms of stress and antidepressant response.		Student will work closely with senior graduate students offering support in daily tasks, learning behavioral and molecular techniques, as well as collecting and analyzing data.	<u>bolanos-guzman@tamu.edu</u>
Brooker, Rebecca	485/491	All	Developmental affective neuroscience; how biology and the environment interact to predic children's emotional development (though I'm also doing some research with mothers, so if students have a particular interest in parents, they might also be a good fit).		Students will largely be working with behavioral (emotion coding) and psychophysiological (EEG) data, as well as learning how to record neural and cardiac signals and helping with general lab setup.	rebeccabrooker@tamu.edu
Carney, Ginger	491	Spring	between the nervous system and fat	Students must sign up for research credit and commit to the lab for a one-year minimum. Students must work at least 10 hours each week and present at our weekly lab meeting. Students must be self-motivated and have the ability to work independently after an initial training period.	Students will learn basic genetic and molecular	979-845-6587; BSBW 305 gcarney@bio.tamu.edu

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Dulin, Jennifer	485/491	All	The overall area of focus in the Dulin laboratory is neural stem cell transplantation to regenerate spinal cord tissue after spinal cord injury (SCI). We use rodent neural stem cells and rodent models of SCI to investigate key biological questions that will be critical for shaping future human therapies. Current projects include mapping neural circuitry between host and graft neurons, characterizing phenotypes of neurons in mature graft tissue, and identifying key types of stem cell-derived neurons that are most critical for establishing recovery of motor, sensory, and autonomic function after SCI.	Must be willing to commit at least 15 hours/week. Must have at least a 3.0 GPA.	Students will have the opportunity to learn neural stem cell isolation and culture, histology and immunohistochemistry, fluorescence and confocal microscopy, image analysis, animal behavioral assessments, and/or animal surgical techniques. Animal work will require a commitment of at least 3 consecutive terms, due to the time required for training to proficiency. Students who generate data that is included in manuscripts will be awarded coauthorships.	jdulin@bio.tamu.edu
Eitan, Shoshy	485 for new students w/ opportunity to take 491 after 2 semesters	All	Our lab focuses on the effect of opioid drugs on behavior, mental health, cell signaling, and gene expression using a mouse model.	Must be a Psychology major and/or Neuroscience minor. Students will be required to register for 3 credit hours, and be expected to be available for a minimum of 9 hours per week (Fall, Spring) or 12 hours per week (Summer).	Assisting in behavioral and molecular experiments, data collection/entry/analysis, animal husbandry, participation in journal club-style lab meetings.	chris.horrax@gmail.com
Garcia, L. Rene	491	All	Cellular, genetic and molecular regulation of neural-muscular circuit function involved in motivated behaviors of animals.	Students must have an overall GPA greater than 3.4. Students are required to enroll into the Biology 491 class and must commit 15-20 hours a week.	Research projects (biochemistry, genetics, molecular biology, imaging, etc) will be designed to fit the student's interest. The more time a student can commit to the project, the more ambitious/interesting the project can be.	979-845-2989; BSBW 305 rgarcia@mail.bio.tamu.edu
Geoffroy, Cédric	485/491	All	The lab focuses on spinal cord injury. The two main goals are 1) to understand how aging can impact axon growth after spinal cord injury at the molecular and cellular level, and 2) to better understand the physiopathology and health complications occurring after chronic spinal cord injury.	One-year commitment required; 12-15 hours per week (flexible hours).	Depending on the projects, students will learn genetic and molecular techniques, cell culture, histology, immunochemistry, fluorescent microscopy, surgical techniques and/or animal behavior.	geoffroy@tamhsc.edu
Geraci, Lisa	485/491	All	Cognitive Psychology: Memory, personality, education, memory, and/or age related research		Running experiments, Entering data, Assisting in data analysis, Reading and learning about project-related literature, Helping plan or construct future investigations.	lgeraci@tamu.edu
Grau, Jim	485	All	Learning/Behavioral & Cellular Neuroscience: 1. Learning 2. Spinal cord plasticity 3. Recover after spinal injury	We are particularly interested in students seeking careers in medicine or neuroscience. Students must have a strong GPR (> 3.5) and SAT, GRE, or MCAT scores. Because intensive training is required, we seek students who can make at least a one year commitment.	The work is conducted using animal subjects (rats). Tasks include surgery, behavioral testing, histology, cellular assays, and data entry.	j-grau@tamu.edu

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Han, Arum	485/491	All	Organ-on-a-chip, brain-on-a-chip, neuroengineering, http://nanobio.tamu.edu	Must be willing to commit at least 10hr/week during regular semesters (12-15hr/week recommended), full time during summer semester. Min GPA 3.2 in major courses. Due to intensive training requirement, at least 2 semester commitment required.	Students will participate in development and fabrication of organ-on-a-chip devices, testing of these devices, analysis of data generated from these devices and compare them to conventional methods. Bench work will involve both microfabrication of devices as well as testing these devices through various cell culture. Students will typically work closely with senior PhD students and/or postdoctoral researchers.	When contacting, please send CV & Transcript <u>arum.han@ece.tamu.edu</u>
Hardin, Paul	491	All	We study how biological clocks time daily cycles in gene expression, physiology and behavior.	Must have completed BIOL 111 and 112 and CHEM 101/111 and 102/112 with a minimum grade of B, must have a GPA of 3.4 in science classes (i.e. Biology, Math, Statistics, Chemistry and Physics), must be classified as a sophomore or junior, and must be majoring in Biology, Biochemistry or Genetics.	combination of which graduate students and post- docs have projects that an undergraduate student can contribute to and the research interests of the	BSBW 308 phardin@bio.tamu.edu
Hook (Schapiro), Michelle	485/491	All	Spinal cord injury, recovery, pain, depression	One year commitment required.	Students will learn behavioral assessments, immunohistochemistry, molecular assays	hook@medicine.tamhsc.edu
Ko, Gladys	485/491	All	Diabetic Retinopathy; Circadian Regulation of Retina Physiology	Tasks Required/Prereqs: General Biology. Preferred NRSC 277		gko@cvm.tamu.edu Veterinary Integrative Biosciences TAMU MS 4458
Li, Jianrong	485/491	Spring & Fall	Neuroinflammation, demyelinating diseases such as multiple sclerosis, microglial functions in brain development	Basic molecular and cellular biology knowledge. Highly motivated, responsible, and hardworking individuals with solid communication skills.		jrli@cvm.tamu.edu
MacNamara, AnnMarie	485/491	All	Clinical: Neuroscience of emotion and anxiety.	A minimum commitment of 6 hours/week for 2 semesters (e.g., both summer sessions and fall 2018; fall 2018 and spring 2019) is required.	As an RA in the lab you will run EEG and/or fMRI experiments on human participants. You will be trained in these methods.	https://goo.gl/forms/udx1NrQYP zefYTxX2 (complete form)
Mathur, Vani	485 only for 1st semester in the lab; (491 possible, w/ approval, for students who've spent more time in the lab)	All		1) Collecting data requires extensive training on psychophysical equipment. Therefore, a commitment of at least two semesters is strongly recommended. (full summer can satisfy this requirement). 2) Training on lab protocols takes time and is required before RAs can help with data collection and study conduct.	conscientious students are strongly encouraged to apply! Students will also be expected to support administration and maintenance of the lab, work as part of a collaborative team. Most RAs work in the	1) Apply via the following link: https://goo.gl/forms/v633OwPS1 RWGnXW03  2) Contact Info.: vmathur@tamu.edu

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McMahan, U.J.	491	All	Factors that regulate the function and development of synapses in the nervous system of various animal species, as revealed by high-resolution imaging, chemical characterization and experimental manipulation of specific synaptic macromolecules and organelles.	Undergraduate majors in any of the biological sciences, chemistry, physics, computer science or mathematics are welcome to apply.	Project will be tailored to student's background and goals, but will it require 12-16hrs/week.	grantser@bio.tamu.edu
Meagher, Mary	485	All	Studying the interactions between pain and psychological/emotional processes. Current projects examine how factors such as trauma, stress, emotion, inflammation, and expectation influence laboratory-induced and clinical pain sensitivity.	Motivated students have the ability to present research; you must commit 2 semesters to the lab and 9 hours per week, and preferably have taken PSYC or NRSC classes. Requirements are a 3.5 or higher GPR and an interest in graduate or professional school. Your experience in the lab may allow you to receive letters of recommendation for professional and graduate school.	Tasks will include: Recruiting and scheduling participants, Running experiments, Physiological testing and analysis (e.g., EEG, heart rate, skin conductance), Data analysis, Literature reviews.	Follow Link to Apply: bit.ly/2udHT21
Menet, Jerome	491	All	We study how biological rhythms (i.e., rhythms of 24hrs such as the sleep-wake cycle) are generated at the molecular level in the mouse. We are particularly interested in the mechanisms involved in rhythmic gene expression.	Student should have taken biological science classes, and must commit to at least one-year minimum of lab work and be willing to devote 12-15 hours per week (but flexible hours).	Students must be willing to work with mice. Students will be trained to perform genotyping and basic molecular techniques and then work on an independent research project.	979-458-5696; ILSB 3141A menet@bio.tamu.edu
Merlin, Christine	491	All	We study how biological clocks time the seasonal migratory behavior and physiology of monarch butterflies and seek to understand the underlying genetic basis using integrative approaches from genes to behavior.	Motivated students classified as sophomore or junior, with solid background in biological science and chemistry and a GPA above 3.2 are encouraged to apply. Students are expected to make at least a 1-year commitment and work 15hr per week in the lab including evenings and weekends as needed.	Students will first learn monarch husbandry techniques and advance to molecular biology and/or behavior to study the role of the circadian clock in the seasonal migration of monarch butterflies. The projects will be tailored whenever possible to the interest of the students.	979-862-2457; BSBE 118D <u>cmerlin@bio.tamu.edu</u>
Moscarello, Justin	485/491	All	Behavioral neuroscience of learning and memory in an animal model, with a specific interest in the neural circuits of emotional memory and regulation.	Looking for students that can give a minimum one year commitment.	Students will become involved in all elements of research, including basic handling, behavioral testing, surgical techniques, histological examination, etc.	jmm31@tamu.edu
Orr, Joseph	485/491	All	Cognitive Neuroscience of Goals & Action Research in our lab examines how the brain keeps us on task while shielding goals from distraction. These executive functions allow us to focus on work and multitask more efficiently. These abilities are disrupted in illnesses such as addiction and schizophrenia. Most of our work involves healthy adults, but may involve patient populations. We use a variety of neuroscience techniques such as magnetic resonance imaging (MRI) and brain stimulation.	Minimum 2 semesters, 2 credits commitment.	Tasks: running research participants in psychology and neuroscience experiments, literature reviews, preprocessing data, participating in lab meetings. This research will give you excellent experience for applying to medical school or graduate school in cognitive/ health sciences.	joseph.orr@tamu.edu

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Panin, Vlad	491	All	Developmental affective neuroscience; emotional development; biomarkers of risk for mental illness; transgenerational transmission of risk	GPA greater than 3.2. Students are expected to make a 1-year commitment and work for 15-20 hours a week.	Research projects will be multidisciplinary, including approaches from neurobiology, genetics, biochemistry, and high-resolution imaging.	panin@tamu.edu
Park, Hangue	485/491	Spring	Neuroelectronics/Neuroprosthesis	Please email your CV		Email CV to: hangue.park@tamu.edu
Park, Sung Il	485/491	All	antenna systems and integrated circuit systems. In parallel, we are studying novel		We have close collaborations with Dussor/Price lab at UT Dallas, Barrow Neurological Institute in AZ, University of Leeds in UK. We do animal studies and clinical studies, and you will be exposed to completely new research environment that you've never experienced. There will be lot of opportunities for publications in high profiles journals such as Nature and Science. You can also visit lab website below to find more information. http://bioelectronics.tamu.edu/	Email CV to: sipark@tamu.edu
Reddy, Samba	485/491	Fall	that is currently focusing on neurosteroid	At least a 2 full semester commitment. Time management skills (including being able to follow a lab schedule), science background preferred, GPA above 3.25	Many of our undergrads take on the task of EEG, Behavioral, Video, or Cell counting analysis.	Please send CV or Resume to: dunlap@medicine.tamhsc.edu
Riley, Bruce	491	All	Through genetic analysis of zebrafish embryos, we study early development of the inner ear and other sensory organs of the head.	I ask undergraduate students to commit to working at least 2 semesters.	Students should expect to spend 15-20 hours per week in the lab and be willing to work evenings and weekends as needed.	979-845-4302; BSBE 104 <u>briley@bio.tamu.edu</u>
Rimer, Mendell	485/491	All	*	GPA > 3.2 and future interests in a career in biomedical science make great candidates for the position. Must commit to work at least two continued terms (semesters).	Students are expected to work at least 10-12 hours/week.	mjrimer@medicine.tamhsc.edu
Rosenthal, Gil	491	All	Evolutionary biology of sexual communication using swordtail fish as a model system. swordtail.tamu.edu	Interest in a career in basic scientific research. If you're committed to going to professional school, you are probably better off in a biomedical laboratory. A minimum commitment of 9 hours per week for two semesters is required. Freshmen, sophomores, and juniors only please.	Students will start by learning the basics of animal husbandry (fish care), behavioral trials, and molecular techniques; then, in the second or third semester of their stay in the lab, will work with graduate students and PI to develop an independent research project such as an Undergraduate Research Scholars thesis. Students will be exposed to a variety of behavioral, morphological and genetic techniques and will have the opportunity to participate in field research at the CICHAZ field station in central Mexico.	*

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Russell, Gül	485	Spring & Fall (Summer possible)	History of Neuroscience, and Vision; History of Art, and Perception, Illusions, Neuro-aesthetics; History of Medicine. Anatomical illustrations, Cross Cultural Transmission of Scientific Ideas.	No prerequisites. Open to all disciplines.	Short class presentations. End of term Research project required.	russell@medicine.tamhsc.edu
Shapiro, Lee	485/491	All	Neurogenesis, neuroinflammation, peripheral inflammation/neuroinflammation axis, epilepsy, traumatic brain injury, posttraumatic epilepsy, military illness.		Students will be involved in performing immunocytochemistry, quantitative microscopy, confocal microscopy, and other general lab tasks	lshapiro@tamhsc.edu
Smith, Rachel	485	All	Addiction Neuroscience Research	Due to the technical training needed for these tasks, requirements include 10 hours/week, 1-2 year commitment, and GPA >3.2.	Lab work involves behavioral experiments with drug self-administration in rats, and histology on brain tissue.	rachelsmith@tamu.edu
Srinivasan, Rahul	485/491	All	My lab is interested in Parkinson's disease. There are two specific areas that we work on: (1) Neuroprotective treatment strategies for Parkinson's disease and (2) The role of astrocytes in Parkinson's disease. We use a wide variety of physiological techniques in our lab.		You will learn basic lab practice and many techniques that will make you more competitive for grad school.	
Sun, Yuxiang	485/491	All	Neurodegenerative diseases (such as Alzheimer's disease), Neuro-inflammation, Feeding behavior, Obesity, Diabetes, and Aging.  http://nfs.tamu.edu/people/sun-yuxiang/	Spot in lab is guaranteed for student who are a part of the lab for more than 2 semesters, a co-author publication is a high possibility.	Student will be exposed to genetically engineered mice, cellular and molecular biology techniques, neuro-behavior assays, and neuroendocrine theory/analysis. Hands-on experiments will be taught/mentored by research assistant professor or graduate students. The students will have ample opportunities to interact with the professor and contribute to publications. For students who register more than 2 semesters, a co-author publication is a high possibility.	Department of Nutrition and Food Science (NFSC) Texas A&M University 214C Cater-Mattil; 2253 TAMU College Station, TX 77843-2253 Phone: 979-862-9143 (office) Yuxiang.Sun@tamu.edu
Vaid, Jyotsna	485	Spring	Bilingualism and the mind     Gender and race in psychological inquiry     Writing systems journal editorial help		Library research, data collection and coding, proofreading, some literature review writing.	įvaid@tamu.edu

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Wang, Jun	485/491	All	Our research is focused on the cellular and circuit mechanisms of drug and alcohol use disorder. We are particularly interested in the striatal circuit of the basal gang that controls voluntary actions. We use multiple state-of-the-art approaches to explore the changes induced by excessive alcohol intake and to seek a persistent reduction of alcohol intake using in vivo optogenetics to reverse alcohol-mediated synaptic plasticity. We use a large number of transgenic mice and engineered viral vectors to target a specific neural circuit. Several rodent models of the alcohol use disorder are used in the lab. Slice electrophysiology is used to measure electrical changes in selective striatal neurons. Confocal imaging and automated analysis are used to analyze the connectome of striatal neurons. In vivo fiber photometry is being set up to measure the activity of specific neurons while animals are conducting a specific behavior.	We are particularly interested in Sophomores with high GPAs and future careers towards medical schools and graduate programs. Students who can use Matlab to program are highly welcome. Please email your CV including your graduate year and GPA.	The responsibilities of the Undergraduate Research Assistants include: mouse breeding, tattoo, tissue collection, wean, Excel database management for transgenic mice, PCR, training mice and rats to consume alcohol using the two-bottle choice drinking procedure and operant self-administration paradigm, running open field experiments, cryostat sectioning of rodent brains, section mounting, fluorescent imaging analysis using Imaris and Photoshop, electrophysiological data analysis, statistics using SigmaPlot, data organization using Excel, constructing and revising scientific graphs using Origin. The senior students who stay in the lab for more than one year may have opportunities to have independent projects, conduct stereotaxic viral infusion, and present at meeting. http://medicine.tamhsc.edu/next/faculty/junwang.html and http://people.tamu.edu/~jwang188/	Daisy Wang xuehua.wang@medicine.tamhsc. edu
Worthy, Darrell	485/491	Spring	The Worthylab focuses on examining human learning and decision-making using behavioral experiments, neuroscience methods such as fMRI, galvanic skin response, genetic testing, or physiological methods, and mathematical and computational modeling of behavior. We're interested in identifying the algorithms the brain utilizes when learning and making decisions. A second line of work is more applied. Our lab uses well-developed experimental paradigms from cognitive science to examine issues such as how depression, anxiety, substance use, or lack of inhibition affect how people respond to rewards during decision-making, how personality characteristics and individual differences predict who will "choke under pressure", how aging or cognitive development affect learning related processes, and how working memory capacity, stress, or other environmental or individual differences factors affect cognitive performance.		The primary responsibility of research assistants in the Worthylab is to help run human participants in our experiments. Other minor duties include testing whether experiment programs run correctly prior to running participants, and data entry such as listing data file names for analysis. Students have the option of becoming more involved in research by designing their own project or running studies that require special attention. Many students take 485 and then conduct their own research project as a 491 student. Our lab accommodates students wishing to simply earn some research credit as well as students who would like more advanced preparation for graduate school.	worthyda@tamu.edu